

KENDRIYA VIDYALAYA SANGATHAN

JABALPUR REGION

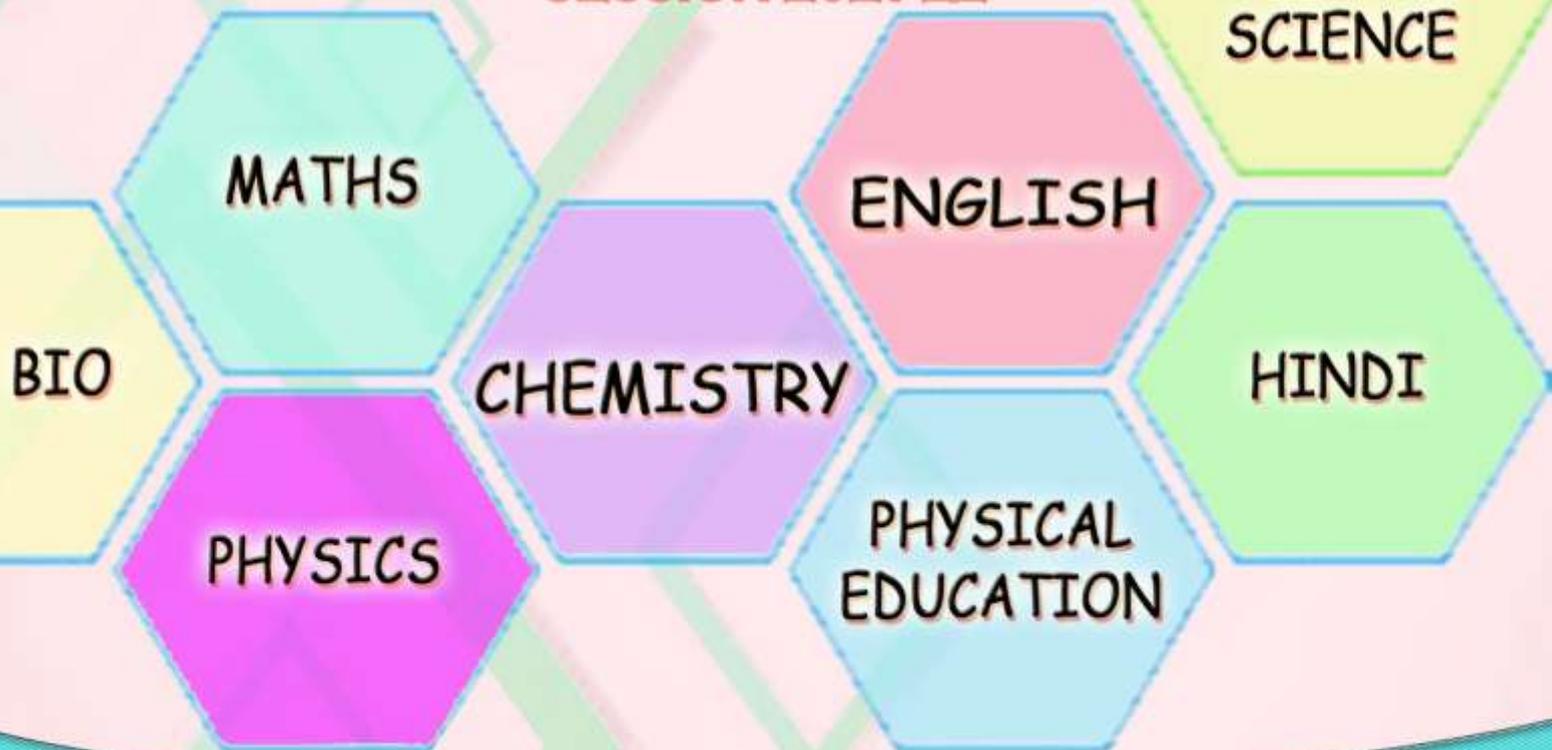


तत् सव पूषन् अपावृषु
केन्द्रीय विद्यालय संगठन



STUDENT HELP BOOK CLASS - XII (SCIENCE) TERM - II

SESSION 2021-22



KENDRIYA VIDYALAYA SECL NOWROZABAD

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CONTENT

SYLLABUS FOR TERM – II (as prescribed by CBSE)

ENGLISH, HINDI, MATHS, PHYSICS, CHEMISTRY, BIOLOGY, COMPUTER SCIENCE, PHYSICAL EDUCATION

Question Bank & Revision Notes for Term 2

ENGLISH, HINDI, MATHS, PHYSICS, CHEMISTRY, BIOLOGY, COMPUTER SCIENCE, PHYSICAL EDUCATION

SAMPLE PAPERS with Marking scheme for Term 2 (as issued by CBSE)

ENGLISH, HINDI, MATHS, PHYSICS, CHEMISTRY, BIOLOGY, COMPUTER SCIENCE, PHYSICAL EDUCATION

English Core
Code No. 301
Class XII (2021-22) TERM 2 SYLLABUS

Code No. 301
Class XII (2021-22)
Term Wise Syllabus

SECTION	TERM 1	WEIGHTAGE (IN MARKS)	TERM II	WEIGHTAGE (IN MARKS)
A	Reading Comprehension: (Two Passages) <ul style="list-style-type: none"> Unseen passage (factual, descriptive or literary/ discursive or persuasive) Case Based Unseen (Factual) Passage 	14 (8+6 Marks)	Reading Comprehension: (Two Passages) <ul style="list-style-type: none"> Unseen passage (factual, descriptive or literary/ discursive or persuasive) Case Based Unseen (Factual) Passage 	14 (8+6 Marks)
B	Creative Writing Skills : <u>Short Writing Tasks</u> <ul style="list-style-type: none"> Notice Writing Classified Advertisements <u>Long Writing Tasks(One)</u> <ul style="list-style-type: none"> Letter to an Editor (giving suggestions or opinion on issues of public interest) Article Writing 	3+5 marks Total=08	Creative Writing Skills : <u>Short Writing Tasks</u> <ul style="list-style-type: none"> Formal & Informal Invitation Cards or the Replies to Invitation/s <u>Long Writing Tasks(One)</u> <ul style="list-style-type: none"> Letter of Application for a Job Report Writing 	3+5 Marks Total=08
C	Literature : Literary-prose/poetry extracts (seen- texts) to assess comprehension and appreciation, analysis, inference, extrapolation Questions Based on Texts to assess comprehension and appreciation, analysis, inference, extrapolation <u>Book- Flamingo (Prose)</u> <ul style="list-style-type: none"> The Last Lesson Lost Spring Deep Water <u>Book-Flamingo (Poetry)</u> <ul style="list-style-type: none"> My Mother at Sixty-Six An Elementary School Classroom in a Slum Keeping Quiet <u>Book-Vistas (Prose)</u> <ul style="list-style-type: none"> The Third Level The Enemy 	11 Marks for Flamingo + 7 Marks for Vistas = 18 Marks	Literature: Questions based on extracts/texts to assess comprehension and appreciation, analysis, inference, extrapolation <u>Book-Flamingo (Prose)</u> <ul style="list-style-type: none"> The Rattrap Indigo <u>Book-Flamingo (Poetry)</u> <ul style="list-style-type: none"> A Thing of Beauty Aunt Jennifer's Tigers <u>Book-Vistas (Prose)</u> <ul style="list-style-type: none"> Should Wizard Hit Mommy? On the Face of It Evans Tries an O Level 	11 Marks for Flamingo + 7 Marks for Vistas = 18 Marks
	TOTAL	40	TOTAL	40
	ASL	10	ASL	10
	GRAND TOTAL	40 + 10 = 50	GRAND TOTAL	40 + 10 = 50

Prescribed Books

- Flamingo:** English Reader published by National Council of Education Research and Training, New Delhi
- Vistas:** Supplementary Reader published by National Council of Education Research and Training, New Delhi

हिन्दी आधार
Code No. 302
Class XII (2021-22) TERM 2 SYLLABUS

कक्षा 12वीं हिंदी 'आधार' परीक्षा हेतु पाठ्यक्रम विनिर्देशन 2021-2022 (कोड सं. 302) द्वितीय सत्र

विषयवस्तु		उप भार	कुलभार
1	कार्यालयी हिंदी और रचनात्मक लेखन		20
1	दिए गए तीन नए और अप्रत्याशित विषयों में से किसी एक विषय पर लगभग 150 शब्दों में रचनात्मक लेखन (5 अंक x1 प्रश्न)	05	
2	औपचारिक विषय से संबंधित पत्र लेखन। (5 अंक x1 प्रश्न) (विकल्प सहित)	05	
3	कहानी/नाटक की रचना प्रक्रिया पर आधारित दो लघु उत्तरीय प्रश्न (3 अंक x 1 प्रश्न) + (2 अंक x 1 प्रश्न) (विकल्प सहित)	05	
4	समाचार लेखन/फीचर लेखन/आलेख लेखन पर आधारित दो लघु उत्तरीय प्रश्न (3 अंक x 1 प्रश्न) + (2 अंक x 1 प्रश्न) (विकल्प सहित)	05	
2	पाठ्यपुस्तक आरोह भाग - 2 तथा अनुपूरक पाठ्यपुस्तक वितान भाग-2		20
1	काव्य खंड पर आधारित तीन प्रश्नों में से किन्हीं दो प्रश्नों के उत्तर (लगभग 50-60 शब्दों में) (3 अंक x 2 प्रश्न)	6	
2	गद्य खंड पर आधारित चार प्रश्नों में से किन्हीं तीन प्रश्नों के उत्तर (लगभग 50-60 शब्दों में) (3 अंक x 3 प्रश्न)	9	
3	अनुपूरक पाठ्यपुस्तक वितान भाग-2 के पठित पाठों पर तीन अंक का एक तथा दो अंक का एक प्रश्न पूछा जाएगा (विकल्प सहित) (1 X 3)+(1 X 2)	5	
3	आंतरिक मूल्यांकन		10
	परियोजना कार्य	10	
	कुल अंक		50

सत्र-2 2021-22 में निम्नलिखित पाठ सम्मिलित किए गए हैं -

पाठ्यपुस्तक - आरोह भाग - 2

काव्य खंड	गद्य खंड
शमशेर बहादुर सिंह - उषा	फणीश्वर नाथ रेणु - पहलवान की ढोलक
तुलसीदास - (i) कवितावली (ii) लक्ष्मण मूर्च्छा और राम का विलाप	रज़िया सज्जाद ज़हीर - नमक
फ़िराक गोरखपुरी - (i) रुबाइयाँ (ii) गज़ल	बाबा साहेब भीमराव आंबेडकर - (i) श्रम विभाजन और जाति - प्रथा (ii) मेरी कल्पना का आदर्श समाज

अभिव्यक्ति और माध्यम

1. कैसे करें कहानी का नाट्य रूपांतरण
2. कैसे बनता है रेडियो नाटक
3. नए और अप्रत्याशित विषयों पर लेखन
4. पत्रकारीय लेखन के विभिन्न रूप और लेखन प्रक्रिया
5. विशेष लेखन - स्वरूप और प्रकार

अनुपूरक पाठ्यपुस्तक - वितान भाग - 2

1. ओम थानवी - अतीत में दबे पाँव
2. ऐन फ्रैंक - डायरी के पन्ने

निर्धारित पुस्तकें:

1. आरोह, भाग-2, एन.सी.ई.आर.टी., नई दिल्ली द्वारा प्रकाशित नवीनतम संस्करण
2. वितान, भाग-2, एन.सी.ई.आर.टी., नई दिल्ली द्वारा प्रकाशित नवीनतम संस्करण
3. अभिव्यक्ति और माध्यम, एन.सी.ई.आर.टी., नई दिल्ली द्वारा प्रकाशित नवीनतम संस्करण

Mathematics
Code No. 041
Class XII (2021-22) TERM 2 SYLLABUS

One Paper

Max Marks: 40

No.	Units	Marks
III.	Calculus	18
IV.	Vectors and Three-Dimensional Geometry	14
VI.	Probability	8
	Total	40
	Internal Assessment	10
	Total	50

Unit-III: Calculus

1. Integrals

Integration as inverse process of differentiation. Integration of a variety of functions by substitution, by partial fractions and by parts, Evaluation of simple integrals of the following types and problems based on them.

$$\int \frac{dx}{x^2 \pm a^2}, \int \frac{dx}{\sqrt{x^2 \pm a^2}}, \int \frac{dx}{\sqrt{a^2 - x^2}}, \int \frac{dx}{ax^2 + bx + c}, \int \frac{dx}{\sqrt{ax^2 + bx + c}}$$

$$\int \frac{px + q}{ax^2 + bx + c} dx, \int \frac{px + q}{\sqrt{ax^2 + bx + c}} dx, \int \sqrt{a^2 \pm x^2} dx, \int \sqrt{x^2 - a^2} dx$$

Fundamental Theorem of Calculus (without proof). Basic properties of definite integrals and evaluation of definite integrals.

2. Applications of the Integrals

Applications in finding the area under simple curves, especially lines, parabolas; area of circles /ellipses (in standard form only) (the region should be clearly identifiable).

3. Differential Equations

Definition, order and degree, general and particular solutions of a differential equation. Solution of differential equations by method of separation of variables, solutions of homogeneous differential equations of first order and first degree of the type: $\frac{dy}{dx} = f(y/x)$. Solutions of linear differential equation of the type:

$$\frac{dy}{dx} + py = q, \text{ where } p \text{ and } q \text{ are functions of } x \text{ or constant.}$$

Unit-IV: Vectors and Three-Dimensional Geometry

1. Vectors

Vectors and scalars, magnitude and direction of a vector. Direction cosines and direction ratios of a vector. Types of vectors (equal, unit, zero, parallel and collinear vectors), position vector of a point, negative of a vector, components of a vector, addition of vectors, multiplication of a vector by a scalar, position vector of a point dividing a line segment in a given ratio. Definition, Geometrical Interpretation, properties and application of scalar (dot) product of vectors, vector (cross) product of vectors.

2. Three - dimensional Geometry

Direction cosines and direction ratios of a line joining two points. Cartesian equation and vector equation of a line, coplanar and skew lines, shortest distance between two lines. Cartesian and vector equation of a plane. Distance of a point from a plane.

Unit-VI: Probability

1. Probability

Conditional probability, multiplication theorem on probability, independent events, total probability, Bayes' theorem, Random variable and its probability distribution.

INTERNAL ASSESSMENT		10 MARKS
Periodic Test		5 Marks
Mathematics Activities: Activity file record + Term end assessment of one activity & Viva		5 Marks

Note: For activities NCERT Lab Manual may be referred

Assessment of Activity Work:

In first term any 4 activities and in second term any 4 activities shall be performed by the student from the activities given in the NCERT Laboratory Manual for the respective class (XI or XII) which is available on the link : <http://www.ncert.nic.in/exemplar/labmanuals.htm> a record of the same may be kept by the student. A term end test on the activity is to be conducted.

The weightage are as under:

- The activities performed by the student in each term and record keeping : 3 marks
- Assessment of the activity performed during the term end test and Viva-voce : 2 marks

Prescribed Books:

- 1) Mathematics Textbook for Class XI, NCERT Publications
- 2) Mathematics Part I - Textbook for Class XII, NCERT Publication
- 3) Mathematics Part II - Textbook for Class XII, NCERT Publication
- 4) Mathematics Exemplar Problem for Class XI, Published by NCERT
- 5) Mathematics Exemplar Problem for Class XII, Published by NCERT
- 6) Mathematics Lab Manual class XI, published by NCERT
- 7) Mathematics Lab Manual class XII, published by NCERT

Physics
Code No. 042
Class XII (2021-22) TERM 2 SYLLABUS

Class XII Syllabus assigned for Term II (Theory)

Time: 2 Hours

Max Marks: 35

		No of Periods	Marks
Unit-V	Electromagnetic Waves	02	17
	Chapter-8: Electromagnetic Waves		
Unit-VI	Optics	18	17
	Chapter-9: Ray Optics and Optical Instruments		
	Chapter-10: Wave Optics		
Unit-VII	Dual Nature of Radiation and Matter	07	11
	Chapter-11: Dual Nature of Radiation and Matter		
Unit-VIII	Atoms and Nuclei	11	11
	Chapter-12: Atoms		
	Chapter-13: Nuclei		
Unit-IX	Electronic Devices	07	7
	Chapter-14: Semiconductor -Electronics: Materials, Devices and Simple Circuits		
Total		45	35

Unit V: Electromagnetic waves

Chapter-8: Electromagnetic Waves

2 Periods

Electromagnetic waves, their characteristics, their Transverse nature (qualitative ideas only).
Electromagnetic spectrum (radio waves, microwaves, infrared, visible, ultraviolet, X-rays, gamma rays) including elementary facts about their uses.

Unit VI: Optics

Chapter-9: Ray Optics and Optical Instruments

18Periods

Ray Optics: Refraction of light, total internal reflection and its applications, optical fibers, refraction at spherical surfaces, lenses, thin lens formula, lensmaker's formula, magnification, power of a lens, combination of thin lenses in contact, refraction of light through a prism.

Optical instruments: Microscopes and astronomical telescopes (reflecting and refracting) and their magnifying powers.

Chapter-10: Wave Optics

Wave optics: Wave front and Huygen's principle, reflection and refraction of plane wave at a plane surface using wave fronts. Proof of laws of reflection and refraction using Huygen's principle. Interference, Young's double slit experiment and expression for fringe width, coherent sources and

sustained interference of light, diffraction due to a single slit, width of central maximum

Unit VII: Dual Nature of Radiation and Matter

7 Periods

Chapter-11: Dual Nature of Radiation and Matter

Dual nature of radiation, Photoelectric effect, Hertz and Lenard's observations; Einstein's photoelectric equation-particle nature of light.

Experimental study of photoelectric effect

Matter waves-wave nature of particles, de-Broglie relation

Unit VIII: Atoms and Nuclei

11Periods

Chapter-12: Atoms

Alpha-particle scattering experiment; Rutherford's model of atom; Bohr model, energy levels, hydrogen spectrum.

Chapter-13: Nuclei Composition and size of nucleus Nuclear force Mass-energy relation, mass defect, nuclear fission, nuclear fusion.

Unit IX: Electronic Devices

7 Periods

Chapter-14: Semiconductor Electronics: Materials, Devices and Simple Circuits Energy bands in conductors, semiconductors and insulators (qualitative ideas only) Semiconductor diode - I-V characteristics in forward and reverse bias, diode as a rectifier; Special purpose p-n junction diodes: LED, photodiode, solar cell.

Syllabus assigned for Practical for Term II

Total Periods: 16

The second term practical examination will be organised by schools as per the directions of CBSE and viva will be taken by both internal and external observers. The record to be submitted by the students at the time of second term examination has to include a record of at least 4 Experiments and 3 Activities to be demonstrated by teacher.

Evaluation Scheme

Time Allowed: one and half hours

Max. Marks: 15

Two experiments to be performed by students at time of examination	8 marks
Practical record [experiments and activities]	2 marks
Viva on experiments, and activities	5 marks
Total	15 marks

Experiments assigned for Term-II

1. To find the focal length of a convex lens by plotting graphs between u and v or between $1/u$ and $1/v$.
2. To find the focal length of a convex mirror, using a convex lens.

OR

- To find the focal length of a concave lens, using a convex lens.
3. To determine angle of minimum deviation for a given prism by plotting a graph between angle of incidence and angle of deviation.
4. To determine refractive index of a glass slab using a travelling microscope.
5. To find refractive index of a liquid by using convex lens and plane mirror.
6. To draw the I-V characteristic curve for a p-n junction diode in forward bias and reverse bias.

Activities assigned for Term-II

1. To identify a diode, an LED, a resistor and a capacitor from a mixed collection of such items.
2. Use of multimeter to see the unidirectional flow of current in case of a diode and an LED and check whether a given electronic component (e.g., diode) is in working order.
3. To study effect of intensity of light (by varying distance of the source) on an LDR.
4. To observe refraction and lateral deviation of a beam of light incident obliquely on a glass slab.
5. To observe polarization of light using two Polaroids.
6. To observe diffraction of light due to a thin slit.
7. To study the nature and size of the image formed by a (i) convex lens, (ii) concave mirror, on a screen by using a candle and a screen (for different distances of the candle from the lens/mirror).
8. To obtain a lens combination with the specified focal length by using two lenses from the given set of lenses.

Practical Examination for Visually Impaired Students of XII

Evaluation Scheme (Term I and Term II)

Time Allowed: one hour

Max. Marks:15

Identification/Familiarity with the apparatus	3 marks
Written test (based on given/prescribed practicals)	5 marks
Practical Record	2 marks
Viva	5 marks
Total	15 marks

Chemistry
Code No. 043
Class XII (2021-22) TERM 2 SYLLABUS

SYLLABUS FOR SESSION 2021-22 CLASS XII Term-II

S.No	UNIT	No. of Periods	MARKS
1	Electrochemistry	7	13
2	Chemical Kinetics	5	
3	Surface Chemistry	5	
4	d-and f-Block Elements	7	9
5	Coordination Compounds	8	
6	Aldehydes, Ketones and Carboxylic Acids	10	13
7	Amines	7	
	TOTAL	49	35

Electrochemistry: Redox reactions, EMF of a cell, standard electrode potential, Nernst equation and its application to chemical cells, Relation between Gibbs energy change and EMF of a cell, conductance in electrolytic solutions, specific and molar conductivity, variations of conductivity with concentration, Kohlrausch's Law, electrolysis.

Chemical Kinetics: Rate of a reaction (Average and instantaneous), factors affecting rate of reaction: concentration, temperature, catalyst; order and molecularity of a reaction, rate law and specific rate constant, integrated rate equations and half-life (only for zero and first order reactions).

Surface Chemistry: Adsorption - physisorption and chemisorption, factors affecting adsorption of gases on solids, colloidal state: distinction between true solutions, colloids and suspension; lyophilic, lyophobic, multi-molecular and macromolecular colloids; properties of colloids; Tyndall effect, Brownian movement, electrophoresis, coagulation.

d-and f-Block Elements: General introduction, electronic configuration, occurrence and characteristics of transition metals, general trends in properties of the first row transition metals – metallic character, ionization enthalpy, oxidation states, ionic radii, colour, catalytic property, magnetic properties, interstitial compounds, alloy formation.
 Lanthanoids - Electronic configuration, oxidation states and lanthanoid contraction and its consequences.

Coordination Compounds: Coordination compounds - Introduction, ligands, coordination number, colour, magnetic properties and shapes, IUPAC nomenclature of mononuclear coordination compounds. Bonding, Werner's theory, VBT, and CFT.

Aldehydes, Ketones and Carboxylic Acids: Aldehydes and Ketones: Nomenclature, nature of carbonyl group, methods of preparation, physical and chemical properties, mechanism of nucleophilic addition, reactivity of alpha hydrogen in aldehydes, uses.

Carboxylic Acids: Nomenclature, acidic nature, methods of preparation, physical and chemical properties; uses.

Amines:

Amines: Nomenclature, classification, structure, methods of preparation, physical and chemical properties, uses, identification of primary, secondary and tertiary amines.

PRACTICALS

Term II: At the end of Term II, a **15-mark Practical** would be conducted under the supervision of Board appointed external examiners. This would contribute to the overall practical marks for the subject.

OR

In case the situation of lockdown continues beyond December 2021, a *Practical Based Assessment (pen-paper)* of 10 marks and Viva 5 marks would be conducted at the end of Term II jointly by the external and internal examiners and marks would be submitted by the schools to the Board. This would contribute to the overall practical marks for the subject.

TERM-II Evaluation Scheme

S. No	Practical	Marks
1.	Volumetric Analysis	4
2.	Salt Analysis	4
3	Content Based Experiment	2
4	Project Work and Viva (Internal and External Both)	5
	TOTAL	15

1) Volumetric analysis (4 marks)

Determination of concentration/ molarity of KMnO_4 solution by titrating it against a standard solution of:

- Oxalic acid,
- Ferrous Ammonium Sulphate

(Students will be required to prepare standard solutions by weighing themselves).

2) Salt analysis (Qualitative analysis) (4 marks)

Determination of one cation and one anion in a given salt.

Cations- Pb^{2+} , Cu^{2+} , As^{3+} , Al^{3+} , Fe^{3+} , Mn^{2+} , Ni^{2+} , Zn^{2+} , Co^{2+} , Ca^{2+} , Sr^{2+} , Ba^{2+} , Mg^{2+} , NH_4^+

Anions - $(\text{CO}_3)^{2-}$, S^{2-} , NO_2^- , SO_3^{2-} , SO_4^{2-} , NO_3^- , Cl^- , Br^- , I^- , PO_4^{3-} , $\text{C}_2\text{O}_4^{2-}$, CH_3COO^- (Note: Insoluble salts excluded)

3) Content based experiment

- A. Preparation of Inorganic Compounds
 Preparation of double salt of Ferrous Ammonium Sulphate or Potash Alum.
 Preparation of Potassium Ferric Oxalate.

- B. Tests for the functional groups present in organic compounds:
 Unsaturation, alcoholic, phenolic, aldehydic, ketonic, carboxylic and amino (Primary) groups.

Biology
Code No. 044
Class XII (2021-22) TERM 2 SYLLABUS

COURSE STRUCTURE
CLASS XII (2021 - 22)

EVALUATION SCHEME		
Theory		
Units	Term – I	Marks
VI	Reproduction: Chapter - 2, 3 and 4	15
VII	Genetics and Evolution: Chapter – 5 and 6	20
Units	Term - II	Marks
VIII	Biology and Human Welfare: Chapter – 8 and 10	14
IX	Biotechnology and its Applications: Chapter – 11 and 12	11
X	Ecology and Environment: Chapter – 13 and 15	10
Total Theory (Term – I and Term – II)		70
Practicals Term – I		15
Practicals Term – II		15
Total		100

THEORY

TERM - II

Unit-VIII Biology and Human Welfare

Chapter-8: Human Health and Diseases

Pathogens; parasites causing human diseases (malaria, dengue, chikungunya, filariasis, ascariasis, typhoid, pneumonia, common cold, amoebiasis, ring worm) and their control; Basic concepts of immunology - vaccines; cancer, HIV and AIDS; Adolescence - drug and alcohol abuse.

Chapter-10: Microbes in Human Welfare

Microbes in food processing, industrial production, sewage treatment, energy generation and microbes as bio-control agents and bio-fertilizers. Antibiotics; production and judicious use.

Unit-IX Biotechnology and its Applications

Chapter-11: Biotechnology - Principles and Processes

Genetic Engineering (Recombinant DNA Technology).

Chapter-12: Biotechnology and its Application

Application of biotechnology in health and agriculture: Human insulin and vaccine production, stem cell technology, gene therapy; genetically modified organisms - Bt crops; transgenic animals; biosafety issues, biopiracy and patents.

Unit-X Ecology and Environment

Chapter-13: Organisms and Populations

Organisms and environment: Habitat and niche, population and ecological adaptations; population interactions - mutualism, competition, predation, parasitism; population attributes - growth, birth rate and death rate, age distribution.

Chapter-15: Biodiversity and its Conservation

Biodiversity - Concept, patterns, importance; loss of biodiversity; biodiversity conservation; hotspots, endangered organisms, extinction, Red Data Book, Sacred Groves, biosphere reserves, national parks, wildlife, sanctuaries and Ramsar sites.

PRACTICALS

Max. Marks: 15 for each Term

Evaluation Scheme			
	TERM - I	TERM - II	MARKS
Part A			
One Major Experiment	Experiment No. - 1	Experiment No. - 3	4
One Minor Experiment	Experiment No. - 2	Experiment No. - 4, 5	3
Part B			
Spotting (3 Spots of 1 mark each)	B.1, 2, 3, 4, 5	B.6, 7, 8	3
Practical Record + Investigatory Project & Record + Viva Voce			5
Total			15

Practicals should be conducted alongside the concepts taught in theory classes.

A. List of Experiments

TERM - I:

1. Isolate DNA from available plant material such as spinach, green pea seeds, papaya, etc.
2. Prepare a temporary mount to observe pollen germination.

TERM - II:

3. Prepare a temporary mount of onion root tip to study mitosis.
4. Collect water from two different water bodies around you and study them for pH, clarity and presence of any living organism
5. Collect and study soil from at least two different sites and study them for texture, moisture content, pH and water holding capacity. Correlate with the kinds of plants found in them.

B. Study/observation of the following (Spotting)

TERM - I:

- B.1 Flowers adapted to pollination by different agencies (wind, insects, birds).
- B.2 Identification of stages of gamete development, i.e., T.S. of testis and T.S. of ovary through permanent slides (from grasshopper/mice).
- B.3 Meiosis in onion bud cell or grasshopper testis through permanent slides.
- B.4 T.S. of blastula through permanent slides (Mammalian).
- B.5 Prepared pedigree charts of any one of the genetic traits such as rolling of tongue, blood groups, ear lobes, widow's peak and colourblindness.

TERM - II:

- B.6 Common disease - causing organisms like *Ascaris*, *Entamoeba*, *Plasmodium*, any fungus causing ringworm through permanent slides, models or virtual images. Comment on symptoms of diseases that they cause.
- B.7 Two plants and two animals (models/virtual images) found in xeric conditions. Comment upon their morphological adaptations.
- B.8 Two plants and two animals (models/virtual images) found in aquatic conditions. Comment upon their morphological adaptations.

Practical Examination for Visually Impaired Students of Classes XI and XII
Evaluation Scheme

Max. Marks: 15 for each Term

Topic	Marks
Identification/Familiarity with the apparatus	5
Written test (Based on given/prescribed practicals)	5
Practical Records and Viva	5
Total	15

General Guidelines

- The practical examination will be of one-hour duration.
- The written examination in practicals for these students will be conducted at the time of practical examination of all other students.
- The written test will be of 30 minutes duration.
- The question paper given to the students should be legibly typed. It should contain a total of 8 practical skill based very short answer type questions. A student would be required to answer any 5 questions.
- A writer may be allowed to such students as per CBSE examination rules.
- All questions included in the question paper should be related to the listed practicals. Every question should require about two minutes to be answered.
- These students are also required to maintain a practical file. A student is expected to record the listed experiments Term -wise as per the specific instructions for each subject. These practicals should be duly checked and signed by the internal examiner.
- The format of writing any experiment in the practical file should include aim, apparatus

Computer Science
Code No. 083
Class XII (2021-22) TERM 2 SYLLABUS

TERM 1:

Unit I: Computational Thinking and Programming – 2

- Revision of Python topics covered in Class XI.
- Functions: types of function (built-in functions, functions defined in module, user defined functions), creating user defined function, arguments and parameters, default parameters, positional parameters, function returning value(s), flow of execution, scope of a variable (global scope, local scope)
- Introduction to files, types of files (Text file, Binary file, CSV file), relative and absolute paths
- Text file: opening a text file, text file open modes (r, r+, w, w+, a, a+), closing a text file, opening a file using with clause, writing/appending data to a text file using write() and writelines(), reading from a text file using read(), readline() and readlines(), seek and tell methods, manipulation of data in a text file
- Binary file: basic operations on a binary file: open using file open modes (rb, rb+, wb, wb+, ab, ab+), close a binary file, import pickle module, dump() and load() method, read, write/create, search, append and update operations in a binary file
- CSV file: import csv module, open / close csv file, write into a csv file using csv.writerow() and read from a csv file using csv.reader()

TERM 2:

Unit I: Computational Thinking and Programming – 2

(5 Marks)

- Data Structure: Stack, operations on stack (push & pop), implementation of stack using list.

Unit II: Computer Networks

(10 Marks)

- Evolution of networking: introduction to computer networks, evolution of networking (ARPANET, NSFNET, INTERNET)
- Data communication terminologies: concept of communication, components of data communication (sender, receiver, message, communication media, protocols), measuring capacity of communication media (bandwidth, data transfer rate), IP address, switching techniques (Circuit switching, Packet switching)
- Transmission media: Wired communication media (Twisted pair cable, Co-axial cable, Fiber-optic cable), Wireless media (Radio waves, Micro waves, Infrared waves)
- Network devices (Modem, Ethernet card, RJ45, Repeater, Hub, Switch, Router, Gateway, WIFI card)
- Network topologies and Network types: types of networks (PAN, LAN, MAN, WAN), networking topologies (Bus, Star, Tree)
- Network protocol: HTTP, FTP, PPP, SMTP, TCP/IP, POP3, HTTPS, TELNET, VoIP
- Introduction to web services: WWW, Hyper Text Markup Language (HTML), Extensible Markup Language (XML), domain names, URL, website, web browser, web servers, web hosting

Unit III: Database Management

(20 Marks)

- Database concepts: introduction to database concepts and its need
- Relational data model: relation, attribute, tuple, domain, degree, cardinality, keys (candidate key, primary key, alternate key, foreign key)
- Structured Query Language: introduction, Data Definition Language and Data Manipulation Language, data type (char(n), varchar(n), int, float, date), constraints (not null, unique, primary key), create database, use database, show databases, drop database, show tables, create table, describe table, alter table (add and remove an attribute, add and remove primary key), drop table, insert, delete, select, operators (mathematical, relational and logical), aliasing, distinct clause, where clause, in, between, order by, meaning of null, is null, is not null, like, update command, delete command
- Aggregate functions (max, min, avg, sum, count), group by, having clause, joins : Cartesian product on two tables, equi-join and natural join
- Interface of python with an SQL database: connecting SQL with Python, performing insert, update, delete queries using cursor, display data by using fetchone(), fetchall(), rowcount, creating database connectivity applications

5. Practical

S.No		Marks (Total 30)	Term-1 (15 Marks)	Term-2 (15 Marks)
1	Lab Test:			
	1. Python program	8	6	2
	2. 3 SQL Queries based on one/two table(s), 2 output questions based on SQL queries	4	---	4
2	Report file: Term – 1 : Minimum 15 Python programs based on Term - 1 Syllabus Term – 2 : <ul style="list-style-type: none"> • Minimum 3 Python programs based on Term-2 Syllabus • SQL Queries – Minimum 5 sets using one table / two tables. • Minimum 2 programs based on Python - SQL connectivity. 	7	4	3
3	Project (using concepts learnt in Classes 11 and 12) Term – 1 : Synopsis of the project to be submitted by the students (documentation only, may not submit the code during Term - 1) Term - 2 : Final coding + Viva voce (Student will be allowed to modify their Term 1 document and submit the final executable code.)	8	3	5
4	Viva voce	3	2	1

6. Suggested Practical List:

Term-1

Python Programming

- Read a text file line by line and display each word separated by a #.
- Read a text file and display the number of vowels/consonants/uppercase/lowercase characters in the file.
- Remove all the lines that contain the character 'a' in a file and write it to another file.
- Create a binary file with name and roll number. Search for a given roll number and display the name, if not found display appropriate message.
- Create a binary file with roll number, name and marks. Input a roll number and update the marks.
- Write a random number generator that generates random numbers between 1 and 6 (simulates a dice).
- Create a CSV file by entering user-id and password, read and search the password for given user-id.

Term-2

Python Programming

- Write a Python program to implement a stack using list.

Database Management

- Create a student table and insert data. Implement the following SQL commands on the student table:
 - ALTER table to add new attributes / modify data type / drop attribute
 - UPDATE table to modify data
 - ORDER By to display data in ascending / descending order
 - DELETE to remove tuple(s)
 - GROUP BY and find the min, max, sum, count and average
 - Joining of two tables.

- Similar exercise may be framed for other cases.
- Integrate SQL with Python by importing suitable module.

Database Management

- Create a student table and insert data. Implement the following SQL commands on the student table:
 - ALTER table to add new attributes / modify data type / drop attribute
 - UPDATE table to modify data
 - ORDER By to display data in ascending / descending order
 - DELETE to remove tuple(s)
 - GROUP BY and find the min, max, sum, count and average

- Similar exercise may be framed for other cases.
- Integrate SQL with Python by importing suitable module.

Physical Education
Code No. 048
Class XII (2021-22) TERM 2 SYLLABUS

DISTRIBUTION OF SYLLABUS – CLASS XII – 2021-2022
TERM - I AND TERM - II

TERM I – THEORY MCQ BASED - 35 MARKS		TERM II – THEORY SHORT/LONG ANSWER – 35 MARKS	
*Unit No.	Name	*Unit No.	Name
1	Planning in Sports <ul style="list-style-type: none"> <input type="checkbox"/> Meaning & Objectives Of Planning <input type="checkbox"/> Various Committees & its Responsibilities (pre; during & post) <input type="checkbox"/> Tournament – Knock-Out, League Or Round Robin & Combination <input type="checkbox"/> Procedure To Draw Fixtures – Knock-Out (Bye & Seeding) & League (Staircase & Cyclic) 	3	Yoga & Lifestyle <ul style="list-style-type: none"> <input type="checkbox"/> Asanas as preventive measures <input type="checkbox"/> Obesity: Procedure, Benefits & contraindications for Vajrasana, Hastasana, Trikonasana, Ardh Matsyendrasana <input type="checkbox"/> Diabetes: Procedure, Benefits & contraindications for Bhujangasana, Paschimottasana, Pavan, Muktasana, Ardh Matsyendrasana <input type="checkbox"/> Asthma: Procedure, Benefits & contraindications for Sukhasana, Chakrasana, Gomukhasana, Parvatasana, Bhujangasana, Paschimottasana, Matsyasana <input type="checkbox"/> Hypertension: Tadasana, Vajrasana, Pavan, Muktasana, Ardha Chakrasana, Bhujangasana, Sharasana
2	Sports & Nutrition <ul style="list-style-type: none"> <input type="checkbox"/> Balanced Diet & Nutrition: Macro & Micro Nutrients <input type="checkbox"/> Nutritive & Non-Nutritive Components Of Diet <input type="checkbox"/> Eating For Weight Control – A Healthy Weight, The Pitfalls of Dieting, Food 	4	Physical Education & Sports for CWSN (Children with Special Needs - DIVYANG) <ul style="list-style-type: none"> Concept of Disability & Disorder Types of Disability, its causes & nature (cognitive disability, intellectual

	Intolerance & Food Myths		disability, physical disability) <input type="checkbox"/> Types of Disorder, its cause & nature (ADHD, SPD, ASD, ODD, OCD) <input type="checkbox"/> Disability Etiquettes <input type="checkbox"/> Strategies to make Physical Activities assessable for children with special need.
5	Children & Women in Sports <input type="checkbox"/> Motor development & factors affecting it <input type="checkbox"/> Exercise Guidelines at different stages of growth & Development <input type="checkbox"/> Common Postural Deformities - Knock Knee; Flat Foot; Round Shoulders; Lordosis, Kyphosis, Bow Legs and Scoliosis and their corrective measures <input type="checkbox"/> Sports participation of women in India	7	Physiology & Injuries in Sports <ul style="list-style-type: none"> • Physiological factor determining component of Physical Fitness • Effect of exercise on Cardio Respiratory System • Effect of exercise on Muscular System • Sports injuries: Classification (Soft Tissue Injuries:(Abrasion, Contusion, Laceration, Incision, Sprain & Strain) Bone & Joint Injuries: (Dislocation, Fractures: Stress Fracture, Green Stick, Communated, Transverse Oblique & Impacted) Causes, Prevention & treatment • First Aid – Aims & Objectives
6	Test & Measurement in Sports <ul style="list-style-type: none"> o Motor Fitness Test – 50 M Standing Start, 600 M Run/Walk, Sit & Reach, Partial Curl Up, Push Ups (Boys), Modified Push Ups (Girls), Standing Broad Jump, Agility – 4x10 M Shuttle Run o Measurement of Cardio Vascular Fitness – Harvard Step Test/Rockport Test - <p style="text-align: center;"> <u>Duration of the Exercise in Seconds</u> $\times 100$ 5.5 x Pulse count of 1-1.5 Min after Exercise </p>	9	Psychology & Sports <ul style="list-style-type: none"> • Personality; its definition & types – Trait & Types (Sheldon & Jung Classification) & Big Five Theory • Motivation, its type & techniques • Meaning, Concept & Types of Aggressions in Sports

	<ul style="list-style-type: none"> ○ Rikli & Jones - Senior Citizen Fitness Test 		
8	Biomechanics & Sports <ul style="list-style-type: none"> ● Meaning and Importance of Biomechanics in Sports ● Types of movements (Flexion, Extension, Abduction & Adduction) ● Newton's Law of Motion & its application in sports 	10	Training in Sports <ul style="list-style-type: none"> ● Strength – Definition, types & methods of improving Strength – Isometric, Isotonic & Isokinetic ● Endurance - Definition, types & methods to develop Endurance – Continuous Training, Interval Training & Fartlek Training ● Speed – Definition, types & methods to develop Speed – Acceleration Run & Pace Run ● Flexibility – Definition, types & methods to improve flexibility ● Coordinative Abilities – Definition & types
TERM I – PRACTICAL		TERM II – PRACTICAL	
Project File (About one sport/game of choice)	05 Marks	Project File (Yoga and General Motor Fitness Test)	05 Marks
Demonstration of Fitness Activity	05 Marks	Demonstration of Fitness Activity/Yoga	05 Marks
Viva Voce (From Project File; Fitness)	05 Marks	Viva Voce (From Project File; General Motor Fitness; Yoga)	05 Marks

*For resource material refer Class XII Physical Education Handbook available at Board's Academic website: www.cbseacademic.nic.in

English Core

Code No. 301

QUESTION BANK Class XII (2021-22) TERM 2

Que. 1) Read the passage given below and answer the questions that follow:

1. Though more than a year has passed since the E-waste (Management and Handling) Rules came into effect in May 2012, their implementation is still in a nascent stage, at least in Varanasi, one of the major cities of Uttar Pradesh. In fact, the state ranks fourth among the 10 largest e-waste generating states in the country.

2. The e-waste (Management and Handling) Rules 2011 mandate for safe disposal of electronic and electrical wastes through private bodies. According to the UPSPCB official, it is mandatory for the municipal corporation to provide a site to the private firm for proper disposal of e-waste. The site for this purpose has been made available in Ram Nagar area, he said. The E-waste (Management and Handling) Rules 2011 also suggest that it is the responsibility of the municipal corporation to ensure that e-waste, if found to be mixed with municipal solid waste, is properly segregated, collected and is channelized to either authorized collection centre or dismantler or recycler.

3. The Research Unit of the Rajya Sabha has compiled a comprehensive report on e-waste in India. According to the report, there are 10 states that contribute up to 70 per cent of the total e-waste generated in the country, while 65 cities generate more than 60 per cent of the total e-waste in India. Among the 10 largest e-waste generating states, Maharashtra ranks first followed by Tamil Nadu, Andhra Pradesh, Uttar Pradesh, West Bengal, Delhi, Karnataka, Gujarat, Madhya Pradesh and Punjab.

4. All over the world, the quantity of electrical and electronic waste generated each year, especially by computers and televisions, has assumed alarming proportions.

5. Globally, about 20-50 MT (million tonnes) of e-wastes is disposed of each year, which accounts for 5% of all municipal solid waste. A report of the United Nations predicted that by 2020, e-waste from old computers would jump by 400 percent on 2007 levels in China and by 500 percent in India. Additionally, e-waste from discarded mobile phones would be about seven times higher than 2007 levels and, in India, 18 times higher by 2020. Such predictions highlight the urgent need to address the problem of e-waste in developing countries like India where the collection and management of e-waste and the recycling process is yet to be properly regulated.

6. E-waste releases many toxic substances that are serious health hazards. Unless suitable safety measures are taken, these toxic substances can critically affect the health of employees and others in the vicinity — who manually sort and treat the waste — by entering their body through respiratory tracts, through the skin, or through the mucous membrane of the mouth and the digestive tract. Therefore, the health impact of e-waste is evident. There is no doubt that it has been linked to the growing incidence of several lethal or severely debilitating health conditions, including cancer, neurological and respiratory disorders, and birth defects.

7. This impact is found to be worse in developing countries like India where people engaged in recycling e-waste are mostly in the unorganized sector, living in close proximity to dumps or landfills of untreated e-waste and working without any protection or safeguards. Many workers engaged in these recycling operations are the urban poor and unaware of the hazards associated with them. (Source: TNN)

On the basis of your understanding of the above passage, complete the statements given below with the help of options that follow:

- (a) It is mandatory that the should provide a proper e-disposal site to private firms.
- (i) municipal committee
 - (ii) municipal corporation
 - (iii) health ministry

(iv) area counselor

(b) After segregation, the e-waste should be

- (i) reused
- (ii) reduced
- (iii) recycled
- (iv) resold

(c) By 2020, e-waste from old computers would jump by percent on 2007 level in India.

- (i) 300
- (ii) 400
- (iii) 500
- (iv) 600

(d) The toxic substances enter the body through

- (i) respiratory tracts
- (ii) skin
- (iii) digestive tract
- (iv) all of these

(e) The implementation of e-waste rules is still in a nascent stage which means

- (i) completely developed stage
- (ii) not yet fully developed stage
- (iii) in an unknown stage
- (iv) both (i) and (iii)

Answer the following.

- (a) The E-waste (Management and Handling) Rules came into effect in May 2012. (True/False)
- (b) In Uttar Pradesh, Ram Nagar is the site for e-waste management. (True/False)
- (c) The Rajya Sabha has compiled a report on e-waste in India. (True/False)
- (d) There is an urgent need to address e-waste management in countries.
- (e) In India people engaged in recycling e-waste are mostly in the sector.

Find words from the passage which mean the same as the following:

- (i) compulsory (para 2)
- (ii) surroundings (para 6)

Que. 2)Read the following passage carefully.

1. South India is known for its music and for its arts and rich literature. Madras or Chennai can be called the cultural capital and the soul of Mother India. The city is built low in pleasant contrast to the ghoulish tall structures of Mumbai and Kolkata. It has vast open spaces and ample greenery. The majestic spacious Mount Road looks like a river, wide and deep. A stroll on the Marina beach in the evening with the sea glistening in your face is refreshing. The breeze soothes the body, it refreshes the mind, sharpens the tongue and brightens the intellect.

2. One can never feel dull in Chennai. The intellectual and cultural life of the city is something of a marvel. Every street corner of Chennai has a literary forum, a debating society and music, dance and dramatic club. The intelligent arguments, the sparkling wit and dashing irony enliven both the political and the literary meetings. There is a young men's association which attracts brilliant speakers and equally brilliant listeners to its meetings. It is a treat to watch the speakers use their oratorical weapons. Chennai speakers are by and large sweet and urbane, though the cantankerous, fire-eating variety is quite often witnessed in political campaigning. The urbane speakers weave their arguments slowly like the unfolding of a leisurely Carnatic raga.

3. Music concerts and dance performances draw packed houses. There is hardly any cultural family in Chennai that does not learn and patronise music and dance in its pristine purity. Rukmani Devi Arundale's 'Kalakshetra' is a renowned international centre. It has turned out

hundreds of celebrated maestros and dancers who have brought name and glory to our country. Carnatic music has a peculiar charm of its own. It has the moon's soft beauty and moon's soft pace. Thousands of people flock to the temple 'maidans' to get drunk with the mellifluous melodies of their favourite singers. They sit out all night in the grueling heat, swaying to the rhythm of 'nadaswaram' and rollicking with the measured beats of 'mridangam'. M.S. Subbulakshmi is considered to be the nightingale of the South.

4. The Gods might descend from heaven to see a South Indian damsel dancing. There are several varieties of South Indian dance – Bharatnatyam, Mohiniyattam, Kuchipudi, Kathakali, etc. Age cannot wither nor custom stale its beautiful variety. Bharatnatyam is the most graceful and enchanting dance form, whereas Kathakali is most masculine and virile. South Indian dances combine voluptuousness with purity. Here, every muscle and fibre of the body vibrates into life, and as the tempo increases, a divine flame-like passion bodies forth as if making an assault on heaven.

5. South Indian dress, particularly of the males, is puritanically simple. There you cannot distinguish a judge from an 'ardali' by their dress. South Indian ladies too look charming and graceful in their colourful Kanjeevaram and Mysore silk sarees.

6. South Indian cuisine, especially 'dosa', 'idli' and 'vada' are so delicious that now we can enjoy them almost everywhere in India as well as in some foreign countries. The Madras 'idli', which was a favourite of Gandhiji, is served with 'sambhar' and 'coconut chutney'.

A. On the basis of your understanding of the passage, answer the following questions by choosing the most appropriate option. (1 x 5 = 5 marks)

Question (i) For what is South India mainly known?

- (a) For tasty food
- (b) For its traditional, music, art, literature
- (c) For scenic beauty
- (d) For its delicate and precise ways

Question (ii) Why is it a treat to watch the speakers?

- (a) Because they use oratorical weapons
- (b) Because they are witnessed in campaigning
- (c) Because they weave their arguments fastly
- (d) Because they argue and complain a lot.

Question (iii) What is M.S. Subbulakshmi considered to be?

- (a) Graceful and enchanting
- (b) Masculine and virile
- (c) Nightingale of the South
- (d) Moon's soft beauty

Question (iv) Which is the South Indian dance form?

- (a) Bharatnatyam
- (b) Kuchipudi
- (c) Kathakali
- (d) All of these

Question (v) Why are South Indian dances special?

- (a) Because Gods come from heaven to see them
- (b) Because there aren't many varieties of dance
- (c) Because they are pure as well as sensuous

(d) Because they make an assault on heaven

B. Answer the following questions briefly. (1 × 7 = 7 marks)

Question (i) How does the breeze on Marina Beach affect the author?

Question (ii) How do we know that music is very important for the people of South India?

Question (iii) What is the common connection between language, music and dance of South India?

Question (iv) What makes Carnatic music charming?

Question (v) What is Kalakshetra renowned for?

Question (vi) Find a word from the passage (para-2) which means 'confident, comfortable and polite in social situations'.

Question (vii) Find a word from the passage (para-3) which means 'having a pleasant and flowing sound'.

Que. 3) M/s Shyam Lai & Sons are opening a new general store 'Galaxy Novelties' in Geetanjali Enclave, Dwarika, Delhi. The inauguration ceremony is fixed for Sunday, the 19th of October 20XX at 11 a.m. Prepare a draft of formal invitation letter for the purpose.

Que. 4) You are Leena Sen. The wedding of your elder sister Reena Sen is going to be held on the 15th May, 20XX at Hotel Lake View, Udaipur. Write out an informal invitation to your friend Vinnie requesting her to attend the function.

Que. 5) Draft an application for the post of an accountant in Pioneers (Pvt.) Ltd. Co. Hyderabad in response to their advertisement that appeared in The Times of India dated 1st August, 20XX. Prepare a biodata to be enclosed. You are Nipun/Aparna.

Que. 6) MMD School, Nashik, recently organized a science symposium on the topic: 'Effect of pollution on quality of life'. You are Amit/Amita Raazdan, editor of the school magazine. Write a report on the event for your school magazine. (120 - 150 words)

Que. 7) How did the ironmaster react on seeing the stranger lying close to the furnace? (All India 2012)

.

Que. 8) Why did the peddler derive pleasure from his idea of the world as a rattrap?

Que. 9) What were the terms of the indigo contract between the British landlords and the Indian peasants? (All India 2015)

Que. 10) How was the Champaran incident a turning point in Gandhiji's life? (Comptt. All India 2010)

Que. 11) Read the extract given below and answer the questions that follow.

"Spite of despondence, of the inhuman dearth
Of noble natures, of the gloomy days,
Of all the unhealthy and o'er-darkened ways
Made for our searching: yes in spite of all,
Some shape of beauty moves away the pall
From our dark spirits."

(a) Name the poem and the poet.

(b) Why are we despondent?

- (c) What removes “the pall from our dark spirits”?
(d) Explain, “the inhuman dearth of noble natures.”
(d) What removes the pall from our dark spirits?

Que. 12)Read the extract given below and answer the questions that follow: (Delhi 2000)

Therefore, on every morrow, are we wreathing
A flowery band to bind us to the earth,
Spite of despondence, of the inhuman dearth
Of noble natures, of the gloomy days,
Of all the unhealthy and o'er-darkened ways
Made for our searching:

1. What are the flowery bands that bind us to the earth?
2. What message do the above lines convey?

Que. 13)Read the extract given below and answer the questions that follow: (Delhi 2010)

Aunt Jennifer's tigers prance across a screen,
Bright topaz denizens of a world of green.
They do not fear the men beneath the tree;
They pace in sleek chivalric certainty.

1. How are aunt Jennifer's tigers described?
2. Why are they described as denizens of a world of green?
3. Why are they not afraid of the men?

Que. 14)Why did Roger Skunk go to visit the old owl? (Compartment 2014)

Que. 15)Why is an adult's perspective on life different from that of a child's? (All India 2010)

Que. 16)What qualities of Mr Lamb attracted Derry to him? (All India 2009)

Que. 17) In what sense is the friendship between Mr Lamb and Derry fruitful?

Que. 18)What clues did the answer sheet of Evans provide to the Governor?

Que. 19)What kind of person was Evans? Why did he want to sit for O-level German examination?

Que. 20)What does Keats consider an endless fountain of immortal drink and why does he call its drink immortal?

केन्द्रीय विद्यालय एस० ई० सी० एल० नौरोजाबाद
प्रश्न बैंक

कक्षा - 12

विषय-हिन्दी

सत्र - 2

कार्यालयी हिन्दी और रचनात्मक लेखन

20

प्रश्न-1 दिए गए नए और अप्रत्याशित विषयों में से किसी एक विषय पर लगभग 150 शब्दों में रचनात्मक लेख लिखिए।

क) मेरा प्रिय टाइम पास

ख) झरोखे से बाहर

ग) एक कामकाजी औरत की शाम

प्रश्न-2 अपने मोहल्ले में वर्षा के कारण उत्पन्न हुए जल भराव की समस्या की ओर ध्यान आकृष्ट करने के लिए नगरपालिका अधिकारी को पत्र लिखिए।

प्रश्न-3 चुनाव के दिनों में कार्यकर्ता घर, विद्यालयों और सार्वजनिक जगहों आदि पर बेतहाशा पोस्टर लगा जाते हैं। इससे लोगों को होने वाली असुविधा पर अपने विचार व्यक्त करते हुए **दैनिक लोक वाणी** समाचार पत्र के जनमत कॉलम के लिए पत्र लिखिए।

प्रश्न-4 कहानी के प्रमुख तत्त्व कौन-कौन से हैं?

प्रश्न-5 कहानी का नाट्य रूपान्तरण करते समय किन-किन बातों का ध्यान रखना चाहिए ?

प्रश्न-6 नाट्य रूपान्तरण करते समय कौन-कौन सी समस्याएँ आती हैं ?

प्रश्न-7 संवाद को नाटक का सबसे जरूरी और सशक्त माध्यम क्यों माना जाता है ?

प्रश्न-8 नाटक साहित्य की अन्य विधाओं से कैसे अलग होता है ?

प्रश्न-9 समाचार के तत्वों पर प्रकाश डालिए।

प्रश्न-10 समाचार - लेखन की शैली पर प्रकाश डालिए।

प्रश्न-11 समाचार के छह ककारों का क्या महत्त्व है ?

प्रश्न-12 मुद्रण माध्यमों की किन्हीं 2 विशेषताओं और कमजोरियों का उल्लेख कीजिए।

प्रश्न-13 उल्टा पिरामिड शैली के कितने अंग- अवयव होते हैं ?

प्रश्न-14 फीचर और आलेख में अंतर स्पष्ट कीजिए।

प्रश्न-15 पत्रकार कितने प्रकार के होते हैं ?

प्रश्न-16 पत्रकारिता के प्रमुख प्रकार बताइये।

प्रश्न-17 वॉचडॉग पत्रकारिता किसे कहते हैं ?

प्रश्न-18 पेज थ्री पत्रकारिता किसे कहते हैं ?

प्रश्न-19 विशेषीकृत पत्रकारिता के प्रमुख क्षेत्र कौन-कौन से हैं ?

प्रश्न-20 स्तम्भ लेखन से क्या तात्पर्य है ?

प्रश्न-21 पत्रकारिता की भाषा में बीट किसे कहते हैं ?

प्रश्न-22 'इन डेपथ रिपोर्ट' क्या है ?

प्रश्न-23 पत्रकारीय लेखन एवं सृजनात्मक लेखन में अंतर बताइये।

प्रश्न-24 आलेख लिखते समय किन-किन बातों का ध्यान रखना चाहिए ?

प्रश्न-25 संपादन के प्रमुख सिद्धान्त बताइये।

अथवा

संपादक के प्रमुख बैसाखियाँ बताइये

<p>पाठ्यपुस्तक आरोह भाग-2</p>	<p>15</p>
<p>प्रश्न-19 कविता के किन उपमानों को देखकर यह कहा जा सकता है कि "उषा" कविता गाँव कि सुबह का गतिशील शब्द-चित्र है ?</p> <p>प्रश्न-20 नई कविता में कोष्ठक ,विराम चिह्नों और पंक्तियों के बीच का स्थान भी कविता को अर्थ देता है उषा कविता में कोष्ठकों से कविता में विशेष अर्थ पैदा हुआ है –समझाइए</p> <p>प्रश्न-21 कवितावाली के आधार पर पुष्टि कीजिए कि तुलसी को अपने समय की आर्थिक-सामाजिक समस्याओं की जानकारी थी </p> <p>प्रश्न-22 शोकग्रस्त माहौल में हनुमान के अवतरण को करुण रस के बीच वीर रस का आविर्भाव क्यों कहा गया है ?</p> <p>प्रश्न-23 लक्ष्मण मूर्छा और राम का विलाप कविता के भाषिक सौंदर्य पर टिप्पणी कीजिए अथवा</p> <p>प्रश्न-24 कविता के भाव-वैशिष्ट्य को स्पष्ट कीजिए </p> <p>प्रश्न-25 गजल पाठ के आधार पर खुद का पर्दा खोलने का क्या आशय है ?</p> <p>प्रश्न-26 रुबाईया छंद की विशेषता बताइये </p> <p>प्रश्न-27 पहलवान की ढोलक कहानी में लेखक ने गाँव की किस विभीषिका का वर्णन इस कहानी में किया है ?कैसे</p> <p>प्रश्न-28 कहानी के किस किस मोड़ पर लुट्टन के जीवन में क्या क्या परिवर्तन आए ?</p> <p>प्रश्न-29 'लाहौर अभी भी उनका वतन है और देहली मेरा या मेरा वतन ढाका है' –जैसे उद्गार किस सामाजिक उद्गार का संकेत करते हैं ?</p> <p>प्रश्न-30 नमक की पुड़िया ले जाने के संबंध में सफिया के मन में क्या द्वंद्व था ?</p> <p>प्रश्न-31 जातिप्रथा को श्रम-विभाजन का ही एक रूप न मानने के पीछे अंबेडकर के क्या तर्क हैं ?</p> <p>प्रश्न-32 जातिप्रथा के लेखक के मत से 'दासता' की व्यापक परिभाषा क्या है ?</p> <p>प्रश्न-33 शारीरिक वंश परंपरा और सामाजिक उत्तराधिकार की दृष्टि से मनुष्यों में असमानता संभावित रहने के बावजूद अंबेडकर समता को एक व्यवहार्य सिद्धान्त मानने का आग्रह क्यों करते हैं ? इसके पीछे उनके क्या तर्क हैं?</p>	
<p>अनुपूरक पाठ्यपुस्तक वितान भाग -2</p>	<p>5</p>
<p>प्रश्न-34 क्या सिंधु घाटी की सभ्यता को जल संस्कृति कह सकते हैं ? तर्क सहित उत्तर दीजिये </p> <p>प्रश्न- 35 सिंधु सभ्यता साधन सम्पन्न थी पर उसमें भव्यता का आडंबर नहीं था कैसे ?</p> <p>प्रश्न-36 सिंधु सभ्यता की खूबी उसका सौन्दर्य बोध है, जो राज पोषित या धर्म पोषित न होकर समाज पोषित था" ऐसा क्यों कहा गया है ?</p> <p>प्रश्न-37 सिंधु सभ्यता ताकत से शासित होने की अपेक्षा समझ से अनुशासित सभ्यता थी ,सिद्ध कीजिए </p> <p>प्रसन्न-38 ऐन की डायरी उसकी निजी भावनात्मक उथल-पुथल का दस्तावेज़ भी है इस कथन की विवेचना कीजिए </p> <p>प्रश्न-39 डायरी के पन्ने पाठ के आधार पर ऐन के व्यक्तित्व की तीन विशेषताओं पर प्रकाश डालिए </p> <p>प्रश्न-40 ऐन की डायरी को एक महत्त्वपूर्ण दस्तावेज़ क्यों माना जाता है ?</p>	

Mathematics

Code No. 041

QUESTION BANK Class XII (2021-22) TERM 2

INTEGRALS

2 Marks			
1. Evaluate : $\int \frac{dx}{\sin^2 x \cos^2 x}$	2. Evaluate : $\int \frac{\sec^2 x dx}{\operatorname{cosec}^2 x}$	3. Evaluate : $\int_0^1 \frac{2x dx}{1+x^2}$	4. Evaluate : $\int_0^1 \frac{dx}{\sqrt{1-x^2}}$

4 Marks			
5. Find : $\int (\sqrt{\tan x} + \sqrt{\cot x}) dx$	6. Evaluate : $\int \frac{5x+3}{\sqrt{(x^2+4x+6)}} dx$	7. Evaluate : $\int \frac{(3 \sin \theta - 2) \cos \theta d\theta}{5 - \cos^2 \theta - 4 \sin \theta}$	8. Evaluate : $\int \frac{\sin(x-a)}{\sin(x+a)} dx$
9. Evaluate $\int \frac{x^2 + x + 1}{(x^2 + 1)(x^2 + 2)}$	10. Evaluate $\int \frac{x^2}{(x^2+4)(x^2+9)} dx$	11. Evaluate : $\int \frac{x \sin^{-1} x}{\sqrt{1-x^2}} dx$	12. Evaluate : $\int \frac{\sqrt{x^2+1} [\log(x^2+1) - 2 \log x]}{x^4} dx$
13. Evaluate $\int_1^3 ((x^2 + 3x + e^x) dx,$ as the limit of the sum.	14. Evaluate $\int_1^3 ((x^2 - x) dx,$ as the limit of the sum.	15. Evaluate : $\int_{\pi/6}^{\pi/3} \frac{(\sin x + \cos x) dx}{\sqrt{\sin 2x}}$	16. Evaluate : $\int_0^{\pi/2} \frac{(x \sin x \cos x) dx}{\sin^4 x + \cos^4 x}$

APPLICATION OF INTEGRALS

4 Marks
1. Using integration, find the area of region in the first quadrant enclosed by the x – axis, the line $y = x$ and the circle $(x^2 + y^2 = 32)$.
2. Find the area enclosed by the parabola $4y = 3x^2$ and the straight line $3x - 12y + 12 = 0$.
3. Using integration, find the area bounded by the curve $x^2 = 4y$, and the line $x = 4y - 2$.
4. Using integration, find the area of region $\{(x,y) : x^2 \leq y \leq x \}$
5. Using integration, find the area of region $\{(x,y) : x^2 + y^2 \leq 1 \leq x + y\}$

DIFFERENTIAL EQUATIONS

2 Marks
1. Find the order and degree of the differential equation $x^2 \frac{d^2y}{(dx^2)} = \left\{1 + \left(\frac{dy}{dx}\right)^2\right\}^4$
2. Find the sum of order and degree of the differential equation $\frac{d}{dx} \left\{ \left(\frac{dy}{dx}\right)^3 \right\} = 0$
3. Find the integrating factor of the differential equation $\left(\frac{e^{-2\sqrt{x}}}{\sqrt{x}} - \frac{y}{\sqrt{x}}\right) \frac{dx}{dx} = 1$

3 Marks
1. Find the particular solution of the differential equation $\frac{dy}{dx} = \frac{xy}{x^2+y^2}$, given that $y = 1$ when $x = 0$
2. Find the particular solution of the differential equation $\frac{dy}{dx} + 2y \tan x = \sin x$, given that $y = 0$ when $x = \frac{\pi}{3}$

4 Marks
1. Solve the differential equation $x \log x \frac{dy}{dx} + y = \frac{2}{x} \log x$
2. Find the particular solution of the differential equation $x \frac{dy}{dx} - y + x \operatorname{cosec}\left(\frac{y}{x}\right) = 0$, given that $y = 0$ when $x = 1$
3. Solve the differential equation $x \cos\left(\frac{y}{x}\right) \frac{dy}{dx} = y \cos\left(\frac{y}{x}\right) + x$; $x \neq 0$
4. Solve the differential equation $x \frac{dy}{dx} + y - x + xy \cot x = 0$; $x \neq 0$
5. Solve the differential equation $(1 + x^2) dy + 2xy dx = \cot x dx$; $x \neq 0$

VECTOR ALGEBRA

2 Marks
1. Write the position vector of the point which divides the join of points with position vectors $3\vec{a} - 2\vec{b}$ and $2\vec{a} + 3\vec{b}$ in the ratio 2 : 1
2. Write a vector of magnitude 15 units in the direction of the vector $\hat{i} - 2\hat{j} + 2\hat{k}$
3. If a unit vector \vec{a} makes angle $\frac{\pi}{3}$ with \hat{i} , $\frac{\pi}{4}$ with \hat{j} and an acute angle θ with \hat{k} , then find the value of θ .

4 Marks
1. The two vectors $\hat{j} + \hat{k}$ and $3\hat{i} - \hat{j} + 4\hat{k}$ represent the two sides AB and AC, respectively of ΔABC . Find the length of the median through A.
2. Write the value of λ so that the vectors $\hat{i} + 2\lambda\hat{j} + \hat{k}$ and $2\hat{i} + \hat{j} - 3\hat{k}$ are perpendicular to each other.
3. Vectors \vec{a}, \vec{b} and \vec{c} are such that $\vec{a} + \vec{b} + \vec{c} = \vec{0}$ and $ \vec{a} = 3, \vec{b} = 5$ and $ \vec{c} = 7$. Find the angle between \vec{a} and \vec{b} .
4. If $\vec{a} = 2\hat{i} - 3\hat{j} + \hat{k}, \vec{b} = -\hat{i} + \hat{k}, \vec{c} = 2\hat{j} - \hat{k}$ are three vectors, find the area of parallelogram having diagonals $(\vec{a} + \vec{b})$ and $(\vec{b} + \vec{c})$.

5. Find the vector \vec{p} which is perpendicular to both $\vec{a} = 4\hat{i} + 5\hat{j} - \hat{k}$ and $\vec{b} = \hat{i} - 4\hat{j} + 5\hat{k}$ and $\vec{p} \cdot \vec{q} = 21$, where $\vec{q} = 3\hat{i} + \hat{j} - \hat{k}$

6. Using vectors, find the area of triangle ABC with vertices A(1, 2, 3), B(2, -1, 4) and C(4, 5, -1).

7. If \vec{a} , \vec{b} and \vec{c} are three vectors such that each one is perpendicular to the vector obtained by the sum of other two and $|\vec{a}| = 3$, $|\vec{b}| = 4$ and $|\vec{c}| = 5$, then prove that $|\vec{a} + \vec{b} + \vec{c}| = 5\sqrt{2}$

THREE DIMENSIONAL GEOMETRY

2 Marks

1. If a line makes angles α, β, γ with the positive direction of coordinate axes, then write the value of $\sin^2 \alpha + \sin^2 \beta + \sin^2 \gamma$.

2. The x- coordinate of a point on the line joining the points P(2, 2, 1) and Q(5, 1, -2) is 4. Find its z- coordinate.

3. Find the vector equation of a line passing through the point A(1, 2, -1) and parallel to the line $5x - 25 = 14 - 7y = 35z$.

4. Find the length of intercept, cut off by the plane $2x + y - z = 5$ on the x- axis.

5. Write the distance of plane from $2x - y + 2z + 1 = 0$ from the origin.

4 Marks

1. Find the vector and Cartesian equations of the line through the (1, 2, -4) and perpendicular to the two lines $\vec{r} = 8\hat{i} - 19\hat{j} + 10\hat{k} + \lambda(3\hat{i} - 16\hat{j} + 7\hat{k})$ and $\vec{r} = 15\hat{i} + 29\hat{j} + 5\hat{k} + \mu(3\hat{i} + 8\hat{j} - 5\hat{k})$

2. By computing the shortest distance between the following pair of lines, determine whether they intersect or not? $\vec{r} = (\hat{i} - \hat{j}) + \lambda(2\hat{i} - \hat{k})$; $\vec{r} = (2\hat{i} - \hat{j}) + \mu(\hat{i} - \hat{j} - \hat{k})$

3. Find the vector equation of the plane determined by the points A(3, -1, 2), B(5, 2, 4) and C(-1, -1, 6), Also find the distance of point P(6, 5, 9) from this plane.

4. Find the equation of perpendicular from the point (3, -1, 11) to the line $\frac{x}{2} = \frac{y-2}{3} = \frac{z-3}{4}$. Also find the coordinates of the foot of the perpendicular and the length of the perpendicular.

PROBABILITY

2 Marks

1. Out of 8 outstanding students of a school, in which there are 3 boys and 5 girls, a team of 4 students is to be selected for a quiz completion. Find the probability that 2 boys and 2 girls are selected.

2. The random variable X has a probability distribution P(X) of the following form, where 'k' is some

number.

$$P(X = x) = \begin{cases} k, & \text{if } x = 0 \\ 2k, & \text{if } x = 1 \\ 3k, & \text{if } x = 2 \\ 0, & \text{otherwise} \end{cases} \quad \text{Determine the value of 'k'.$$

3. 12 cards numbered 1 to 12 (one number on one card), are placed in a box and mixed up thoroughly. Then a card is drawn at random from the box. If it is known that the number on the drawn card is greater than 5, find the probability that the card bears an odd numbers.

4. A black and a red die are rolled together. Find the conditional probability of obtaining the sum 8, given that the red die resulted in a number less than 4.

4 Marks

1. A couple has 2 children. Find the probability that both are boys, if it is known that

(i) One of them is a boy.

(ii) the older child is a boy.

2. Of the students in a college, it is known that 60% reside in hostel and 40% are day scholars (not residing in hostel). Previous year results report that 30% of all students who reside in hostel attain Á' grade and 20% of day scholars attain Á' grade in their annual examination. At the end of the year, one student is chosen at random from the college and he has an Á' grade, what is the probability that the student is a hosteller?

3. From a lot of 15 bulbs which include 5 defectives, a sample of 2 bulbs is drawn at random (without replacement). Find the probability distribution of the number of defective bulbs.

4. A random variable X has the following probability distribution :

X	0	1	2	3	4	5	6	7
P(X)	0	K	2K	2K	3K	K ²	2K ²	7K ² + K

Determine :

(i) K (ii) P(X < 3) (iii) P(X > 6) (iv) P(0 < X < 3)

5. Probability of solving specific problem independently by A and B are $\frac{1}{2}$ and $\frac{1}{3}$ respectively. If both try to solve the problem independently, find the probability that

(i) problem is solved

(ii) exactly one of them solved the problem.

Biology

Code No. 044

QUESTION BANK Class XII (2021-22) TERM 2

UNIT: VII (14 Marks)

Chapter: 8 Human Health and Disease

1. What are the various public health measures which you would suggest as safeguard against infection disease?
2. Write down comments on following disease.
(a) Typhoid , (b) pneumonia , (c) dysentery, (d) Plague , (e) diphtheria, (f) common cold,(g) Ascariasis, (h) Elephantiasis (i) ringworm.
3. Describe life cycle of plasmodium in both type of host.
4. Difference between:
(I) Innate immunity and Acquired immunity
(II) Two type of tumor
(III) Primary and secondary immune response
(iv) B- lymphocytes and T- lymphocytes
(v) Vaccination and immunisations
(vi) Active and passive immunity
5. Define the following:
(A) Allergy , (B) Auto immunity, (C) Antibody, (D) LSD , (E) Interferon, (f) Metastasis, (g) Sedative drugs & Psychotropic drugs , (h) Biopsy , (i) withdrawal syndrome
6. Draw a well labeled structure of an antibody molecule.
7. Expand each one to its full form:
1. MALT 2. CMI 3. AIDS 4. NACO 5. HIV, 6. NK 7. PMNL
8. What measures would you take to prevent water born disease?
9. What is AIDS ? Write down its causes, transmission and symptoms, & the mechanism by which the AIDS virus cause deficiency in the immune system of the infected person?
10. What is cancer? Write the types of cancer, causes & treatment.
11. List the harmful effects caused by alcohol/ drug abuse & tobacco smoking.
12. Do you think that friends can influence one to take alcohol/ drug ? If yes, how many one protect himself/herself from such an influence ?
13. In your view what motivates youngsters to take to alcohol or drug and how can this be avoided.

Chapter : 10 Microbes in Human Welfare

1. Write ten useful activity of bacteria, fungi.

- 2 Explain the uses and types of virus.
3. Find out the role of microorganism in the following and discuss it.
(a) SCP (Single cell protein) (b) Soil, (c) Sewage treatment plant, (d) Biogas production.
4. How do biofertilizers enrich the fertility of the soil?
5. What is sewage? What is key difference between primary and secondary sewage treatment plant?
6. Draw well labeled diagram of Biogas plant.
7. What is the utilization of bacteria in agriculture and vinegar industries?
8. Microbes can be used to decrease the use of chemical fertilizers and pesticides. Explain how this can be accomplished.

UNIT: XI (11 Marks)

Chapter : 11 Biotechnology: principles and processes

1. What is gene manipulation or genetic engineering? Explain it.
2. Write application of genetic engineering in Human life
3. Name the scientist who discovered artificial DNA synthesizing method.
4. What do you understand by gene bank? What are its significances.
5. Describe briefly the following:
(I) Origin of replication, (II) PCR, (III) Gel electrophoresis, (IV) Restriction endonuclease enzyme, (V) Bioreactor, (VI) downstream processing, (VII) gene cloning, (VIII) Biolistic or gene gun, (IX) Microinjection
(X) Selectable marker
6. Find out how to distinguish between:
(I) Plasmid DNA and Chromosomal DNA, (II) DNA and RNA
(III) Endonuclease and exonuclease
7. What is vector? Describe its types and characters.
8. Explain the mechanism of recombinant DNA technology in genetic engineering by using plasmid as carrier of genes.
9. What is clone ? Give its preparation, extraction and purification.
10. Can you list 10 recombinant proteins which are used in medical practice? Find out where they are used as therapeutics.
11. Write comments on:
(a) C-DNA, (b) S-DNA, (c) R-DNA, (d) Ligase, (e) Chitinase, (f) Plasmid
12. Who discovered artificial DNA synthesis method?
13. Make a chart showing a restriction enzyme, the substrate DNA on which it acts, the site at which it cuts DNA and the products it produces.

Chapter : 12 Biotechnology and Its Application

1. Can you suggest a method to remove oil(hydrocarbon) from seed based on your understanding of r-DNA technology and chemistry of oil?
2. What is genetically modified food? Give two examples, compare and contrast the advantage and disadvantage of production of genetically modified crop,

3. (a) What is Bt? Example of Bt crop.
(b) By which Bt toxin is coded.
(c) What is cry gene and cry protein?
4. what is RNAi method?
5. What is genetic engineering? Describe the application of genetic engineering in the field of medical science.
6. What is gene therapy? Illustrate using the example of adenosine deaminase deficiency (ADA).
7. Explain the following in brief:
(I) Biopiracy, (II) Biopatent, (III) Humalin, (IV) gene library
8. What is forensic science? Explain DNA fingerprinting method of forensic science.
9. What is transgenic animal? Write its application.

UNIT: X (10 Marks)

Chapter : 13 Organism and population

1. Define the following:
(a) Diapause, (b) Birth rate, (c) Death rate, (d) Population, (e) Biotic potential, (f) Population density, (g) Population equilibrium, (h) Phenotypic adaptation, (i) Camouflage (j) Interspecific competition, (k) Species dominance
2. Differentiate the following:
(a) Parasitism and symbiosis, (b) Mutualism and Commensalism
6. Explain population dispersal in brief.
7. With the help of suitable diagram describe the logistic and exponential growth curve.
8. Write a short note on:
 1. Adaptation of desert plant and animal
 2. Adaptation of plant to water scarcity
 3. Behavioral adaptation in animal
 4. Importance of light to plant
 5. Effects of temperature water scarcity and adaptation of animal
9. Explain different patterns of age pyramid.

Chapter : 15 Biodiversity

1. Explain biodiversity and its different level.
2. Describe different pattern of diversity and showing species area relationship with the help of graph.
3. Write important points of causes of biodiversity loss.
4. Explain "How do we conserve biodiversity?"
5. What do you understand threatened species? Explain its type.
6. Describe the national and international efforts prescribed for the conservation of the forest.

7. What are the main roles of India forest act?

8. Write notes on:

(a) Social forestry, (b) Sacred groove, (c)IUCN

9. Give three hypothesis for explaining why tropic shoe greatest level of species richness.

Physics

Code No. 042

Class XII (2021-22) TERM 2

QUESTION BANK

UNIT –5. Electromagnetic Waves (3 marks)

SYLLABUS:

Electromagnetic waves and their characteristics(qualitative ideas only). Transverse nature of electromagnetic waves. Electromagnetic spectrum (radio waves, microwaves, infrared, visible, ultraviolet, Xrays,gamma rays) including elementary facts about their uses.

1. Mention properties of electromagnetic waves.
2. Name the phenomena which proves transverse nature of e.m .waves.
3. Describe properties ,uses ,application of E.m spectrum.
4. A capacitor , made of two parallel plates each of plate area A and separation d , is being charged by an external ac source. Show that the displacement current inside the capacitor is the same as the current charging the capacitor.

UNIT – 6. Optics (14 marks)

SYLLABUS:

Refraction of light, total internal reflection and its applications, optical fibres, refraction at spherical surfaces, lenses, thin lens formula, lens-maker's formula. Magnification, power of a lens, combination of thin lenses in contact . Refraction and dispersion of light through a prism. Scattering of light - blue colour of the sky and reddish appearance of the sun at sunrise and sunset.

Optical instruments: Microscopes and astronomical telescopes (reflecting and refracting) and their magnifying powers.

Wave optics: wave front and Huygens' principle, reflection and refraction of plane wave at a plane surface using wave fronts. Proof of laws of reflection and refraction using Huygens' principle. Interference, Young's double slit experiment and expression for fringe width, coherent sources and sustained interference of light. Diffraction due to a single slit, width of central maximum.

1. What is total internal reflection and state two conditions required for it. Mention its applications.
2. Derive relation between μ , u , v and R for a spherical surface and hence derive lens maker formula.
3. Derive thin lens formula. Explain Magnification and Power of a lens.
4. Derive expression for focal length for combination of thin lenses in contact.
5. Derive prism formula. Also show graphically variation of angle of deviation with angle of incidence.
6. Define angular dispersion and dispersive power .
7. Why (i) sky appears blue (ii) sun appears reddish at sunrise and at sun set (iii) dangers signals are red.
8. Draw ray diagram of compound microscope to show image formation in normal and far point position. Derive expression for magnifying power also.
9. Draw ray diagram for normal adjustment of a astronomical telescope in and derive expression for magnifying power also.
10. Draw ray diagram for image formation by reflecting telescope. Give two merits of reflecting telescope.
11. How the Resolving power of microscopes and astronomical telescopes changes with (i) aperture (ii) frequency of light.
12. State Huygens' principle and prove laws of reflection and refraction of plane wave at a plane surface on its basis .
13. Draw the shape of wave front (i) converging to a point (ii) diverging from a point (iii) produced from a point source (iv) at far distance (v) reflected from plane mirror (vi) refracted from convex lens (for parallel incidence) .
14. Describe Young's double slit experiment. Write conditions required for sustained interference of light. What are coherent sources?
15. Derive expression for fringe width in double slit experiment.
16. What is diffraction of light? Write the condition required and derive expression for width of central maximum in single slit diffraction.
17. Which phenomenon proves transverse nature of light?

UNIT – 7. Dual Nature of Matter and Radiation(4 marks)

SYLLABUS:

Dual nature of radiation. Photoelectric effect, Hertz and Lenard's observations; Einstein's photoelectric equation-particle nature of light.

Matter waves-wave nature of particles, de Broglie relation. Davisson-Germer experiment.

1. What is Photo electric effect ? Write laws of photoelectric emission.
2. Explain the terms (i)stopping potential (ii) Threshold frequency (iii) threshold energy.
3. Show variation of photo current with frequency and intensity of incident light.
4. Derive the Einstein's photoelectric equation.
5. Draw a labeled diagram of photo cell and explain its working. Mention its two applications.
6. What are matter waves? Derive expression for De broglie wavelength of an electron in electric field.
7. Briefly describe Davission andGermer experiment to show existence of matter waves.
8. Light of Wavelength 5000\AA falls on a metal surface of work function 1.9eV . Find (a) energy of photons in eV (b) K.E of photoelectrons and (c) stopping potential.

UNIT – 8. Atoms and Nuclei (7 marks)

SYLLABUS:

Alpha-particle scattering experiment; Rutherford's model of atom; Bohr model, energy levels, hydrogen spectrum.

Composition and size of nucleus, atomic masses, isotopes, isobars; isotones.. Mass-energy relation, mass defect; nuclear fission and fusion.

1. Explain Alpha-particle scattering experiment and mention important inferences of it.
2. Give main postulates of Rutherford's model of atom . Give its merits and demerits.
3. What is Bohr's model of atom. Explain Hydrogen spectrum .
4. Derive relation between Atomic No. and radius of a nucleus.
5. Explain with examples – (i) isotopes, (ii) isobars (iii) isotones.
7. Write the radioactive decay laws and derive expression to show that radioactive decay is logarithmic.
8. State Mass energy relation and convert 1 eV into Joules.
9. What is mass defect and Binding energy? Show graphically variation in binding energy per nucleon with mass number. State inferences from graph.
10. Distinguish between Nuclear fission and nuclear fusion.
11. Calculate the binding energy per nucleon of $^{40}_{20}\text{Ca}$ nucleus. Given : $m(^{40}_{20}\text{Ca}) = 39.962589\text{u}$, $m_n = 1.008665\text{u}$ $m_p = 1.007825\text{u}$
12. A neutron is absorbed by a ^6_3Li nucleus with subsequent emission of an alpha particle. Write the corresponding nuclear reaction and Calculate the energy released in this reaction in MeV.
Given $M(^6_3\text{Li}) = 6.015126\text{a.m.u}$, $M(^4_2\text{He}) = 4.0026044\text{ a.m.u}$ $M(^1_0\text{n}) = 1.0086654\text{ a.m.u}$, $M(^3_1\text{H}) = 3.016049\text{ a.m.u}$
13. Draw a plot of potential energy of a pair of nucleons as a function of their separations. Mark theregions Where the nuclear force is (i) attractive and (ii) repulsive .
14. The ground state energy of hydrogen atom is -13.6eV . What are the KE and PE of electron in this state?

Numericals of alpha beta series decay , Hydrogen spectrum , energy.

UNIT – 9. Electronic Devices(7 marks)

SYLLABUS:

Energy bands in solids (Qualitative ideas only) conductor, insulator and semiconductor; semiconductor diode - I-V characteristics in forward and reverse bias, diode as a rectifier; special purpose p-n junction diodes: I-V characteristics of LED, photodiode, solar cell,

1. Describe Energy bands in solids and differentiate between conductors, insulators and semiconductors on the basis of it. Define Fermi energy level.
2. Differentiate between pure and impure semiconductors. Derive expression for conductivity of a pure semiconductor.
3. Differentiate between P type and N type semiconductors.
4. What is PN junction? Explain i) depletion layer ii) barrier potential
5. What is Forward and Reverse biasing of a diode. What is an ideal diode?
6. Draw characteristics curve of PN junction for forward and reverse biasing.
7. How does width of depletion layer change with forward and reverse biasing.
8. What is rectification? Give principle, circuit diagram, construction, working and input output waveforms for (i) half wave rectifier (ii) full wave rectifier
10. Describe briefly (i) LED (ii) photo diode (iii) solar cell

Chemistry

Code No. 043

QUESTION BANK Class XII (2021-22) TERM 2

Electrochemistry

1. Calculate the emf of the following cell at 298 K : $\text{Cr(s)} / \text{Cr}^{3+} (0.1\text{M}) // \text{Fe}^{2+} (0.01\text{M}) / \text{Fe(s)}$ [Given : $E^\circ_{\text{Cell}} = +0.30\text{ V}$]
2. The conductivity of 10^{-3} mol/L acetic acid at 25°C is $4.1 \times 10^{-5}\text{ S cm}^{-1}$. Calculate its degree of dissociation, if Λ° for acetic acid at 25°C is $390.5\text{ S cm}^2\text{ mol}^{-1}$.
3. (a) A cell is prepared by dipping a zinc rod in 1M zinc sulphate solution and a silver electrode in 1M silver nitrate solution. The standard electrode potential given: $E^\circ_{\text{Zn}^{2+}/\text{Zn}} = -0.76\text{ V}$, $E^\circ_{\text{Ag}^+/\text{Ag}} = +0.80\text{ V}$ What is the effect of increase in concentration of Zn^{2+} on the E_{cell} ?
(b) Write the products of electrolysis of aqueous solution of NaCl with platinum electrodes. (c) Calculate e.m.f. of the following cell at 298 K: $\text{Ni(s)} / \text{Ni}^{2+} (0.01\text{ M}) // \text{Cu}^{2+} (0.1\text{M}) / \text{Cu (s)}$ [Given $E^\circ_{\text{Ni}^{2+}/\text{Ni}} = -0.25\text{ V}$, $E^\circ_{\text{Cu}^{2+}/\text{Cu}} = +0.34\text{ V}$] Write the overall cell reaction. 5
4. Apply Kohlrausch law of independent migration of ions, write the expression to determine the limiting molar conductivity of calcium chloride.
5. 0.1 M KCl solution offered a resistance of 100 ohms in a conductivity cell at 298 K. If the cell constant of the cell is 1.29 cm^{-1} , calculate the molar conductivity of KCl solution.
6. (a) Equivalent conductance of a 0.0128 N solution of acetic acid is $1.4\text{ mho cm}^2\text{ eq}^{-1}$ and conductance at infinite dilution is $391\text{ mho cm}^2\text{ eq}^{-1}$. Calculate degree of dissociation and dissociation constant of acetic acid.
(b) The equivalent conductances of sodium acetate, sodium chloride and hydrochloric acid are 83, 127 and $426\text{ mho cm}^2\text{ eq}^{-1}$ at 25°C respectively. Calculate the equivalent conductance of acetic acid solution.
7. Solutions of two electrolytes 'A' and 'B' are diluted. The Λ_m of 'B' increases 1.5 times while that of A increases 25 times. Which of the two is a strong electrolyte? Justify your answer. Graphically show the behavior of 'A' and 'B'.
8. The resistivity of a 0.8M solution of electrolyte is $5 \times 10^{-3}\ \Omega\text{cm}$. Calculate its molar conductivity.
9. Q. 7. In a galvanic cell, the following cell reaction occurs:
 $\text{Zn(s)} + 2\text{Ag}^+(\text{aq}) \rightleftharpoons \text{Zn}^{2+}(\text{aq}) + 2\text{Ag(s)}$ $E^\circ_{\text{cell}} = +1.56\text{ V}$
(i) Is the direction of flow of electrons from zinc to silver or silver to zinc?
(ii) How will concentration of Zn^{2+} ions and Ag^+ ions be affected when the cell functions?
10. Calculate the emf of the following cell at 298 K
 $\text{Cr(s)} | \text{Cr}^{3+} (0.1\text{M}) || \text{Fe}^{2+} (0.01\text{M}) | \text{Fe(s)}$ [Given: $E^\circ_{\text{cell}} = +0.30\text{ V}$]
11. X and Y are two electrolytes. On dilution molar conductivity of 'X' increases 2.5 times while that Y increases 25 times. Which of the two is a weak electrolyte and why?
12. Calculate $\Delta_r G^\circ$ & value of equilibrium constant for the following :
a) $\text{Mg(s)} / \text{Mg}^{2+} // \text{Cu}^{2+} / \text{Cu(s)}$; $E^\circ_{\text{Cu}^{2+}/\text{Cu}} = +0.34\text{V}$, $E^\circ_{\text{Mg}^{2+}/\text{Mg}} = -2.36$
b) $\text{Zn(s)} + \text{Cu}^{2+} \rightleftharpoons \text{Zn}^{2+} + \text{Cu}$ $E^\circ_{\text{Cu}^{2+}/\text{Cu}} = +0.34\text{V}$, $E^\circ_{\text{Zn}^{2+}/\text{Zn}} = -0.76\text{V}$
c) $\text{Cu (s)} + 2\text{Ag}^+ \rightleftharpoons \text{Cu}^{2+} + 2\text{Ag(s)}$ $E^\circ_{\text{Cu}^{2+}/\text{Cu}} = +0.34\text{V}$, $E^\circ_{\text{Ag}^+/\text{Ag}} = +0.80\text{V}$

d) $2\text{Fe}^{3+} + 2\text{I}^- \rightarrow 2\text{Fe}^{2+} + \text{I}_2$ has $E_{\text{cell}} = 0.236 \text{ V}$

e) $\text{Fe}^{2+}(\text{aq}) + \text{Ag}^+ \rightarrow \text{Fe}^{3+}(\text{aq}) + \text{Ag}(\text{s})$, $E_{\text{Ag}^+/\text{Ag}} = +0.80\text{V}$, $E_{\text{Fe}^{3+}/\text{Fe}^{2+}} = +0.77\text{V}$

f) $2\text{Cr}(\text{s}) + 3\text{Cd}^{2+} \rightarrow 2\text{Cr}^{3+} + 3\text{Cd}(\text{s})$ $E_{\text{Cr}^{3+}/\text{Cr}} = -0.74\text{V}$, $E_{\text{Cd}^{2+}/\text{Cd}} = -0.40\text{V}$

CHEMICAL KINETICS

1. For a first order reaction, calculate the ratio between time taken to complete three fourth of the reaction and time taken to complete half of the reaction.

1. A reaction is of second order with respect to a reactant. How is the rate of reaction affected, if the concentration of the reactant is reduced to half? What is the unit of rate constant for such a reaction?

2. Define order of reaction. Write the condition under which a bimolecular reaction follows first order kinetics.

3. In a reaction, if the concentration of the reactant R is quadrupled, the rate of reaction becomes sixty four times. What is the order of reaction?

4. A first order reaction has a rate constant of 0.0051 min^{-1} If we begin with 0.10 M concentration of reactant, what concentration of reactant will remain in solution after 3 hours?

6. In a pseudo first order hydrolysis of an ester in water, the following results were obtained :

t/s	0	30	60	90
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[Ester]/mol L ⁻¹	0.55	0.31	0.17	0.085
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(i) Calculate the average rate of reaction between the time interval 30 to 60 s.

(ii) Calculate the pseudo first order rate constant for the hydrolysis of an ester.

7. The rate constant for a first order reaction is 60 s^{-1} How much time will it take to reduce the initial concentration of the reactant to its $1/16^{\text{th}}$ value?

8. Give difference between molecularity and order of reaction.

9. For a reaction, the rate law expression is represented as follows $\text{Rate} = k [\text{A}] [\text{B}]^{1/2}$

(i) Interpret whether the reaction is elementary or complex. Give reason to support your answer.

(ii) Write the units of rate constant for this reaction, if concentration of A and B is expressed in moles/L.

10. The conversion of molecules x to y follows second order kinetics. If concentration of x is increased to three times, how will it affect the rate of formation of y ?

SURFACE CHEMISTRY

1. Distinguish between the meaning of the terms adsorption and absorption. Give one example of each.

2. Why do physisorption and chemisorption behave differently with rise in temperature?

3. Explain what is observed,

(i) when a beam of light is passed through a colloidal solution?

(ii) when an electrolyte, NaCl, is added to hydrated ferric oxide solution?

(iii) electric current is passed through a colloidal solution?

4. How are colloids classified on the basis of

(i) physical state of components?

(ii) nature of dispersed phase?

(iii) interaction between dispersed phase and dispersion medium?

5. (i) What happens, when

- (a) a freshly prepared precipitate of $\text{Fe}(\text{OH})_3$ is shaken with a small amount of FeCl_3 solution?
- (b) persistent dialysis of a colloidal solution is carried out?
6. Distinguish between micelles and colloidal particles.
7. Write one difference in each of the following:
- (i) Lyophobic sol and lyophilic sol.
- (ii) Solution and colloid.
- (iii) Multimolecular colloid and associated colloid
8. What are the three factors which influence the adsorption of the gas on a solid?
9. Explain the reason for following :
- a) Powdered substances more effective adsorbents than their crystalline forms.
- b) Finely divided substance is more effective as an adsorbent.
- c) NH_3 gas adsorbs more readily than N_2 gas on the surface of Charcoal.
- d) Adsorption is accompanied by decrease in entropy.
- e) Enthalpy of chemisorption is high .
- f) Adsorption is always exothermic.
- g) Physical adsorption is reversible , while chemisorption is irreversible
- h) Physisorption decrease with the increase of temperature.
- i) Physical adsorption is multilayered, while chemisorption is monolayered.
- j) It is important to have clean surface in surface studies.
- k) We add alum to purify water.
- l) Adsorption of a gas on the surface of solid is generally accompanied by a decrease in entropy. Still it is spontaneous process.

D and F block elements

1. Name the two transition elements which have abnormal electronic configuration and explain why?
2. Explain, why density of transition elements increases from left to right in a period?
3. Why do transition elements show variable oxidation states?
- (i) Name the element showing maximum number of oxidation states among the first series of transition metals from Sc ($Z = 21$) to Zn ($Z = 30$).
- (ii) Name the element which shows only +3 oxidation state.
4. Explain briefly how +2 state becomes more and more stable in the first half of the first row transition elements with increasing atomic number?
5. Why E° values for Mn, Ni and Zn are more negative than expected?
6. Explain the following
- (i) The second and third rows of transition elements resemble each other much more than they resemble the first row.
- (ii) Copper can not replace hydrogen from acids.
7. Explain the following observations.
- (i) Copper atom has completely filled d-orbitals(3) d^{10} in ground state, yet it is regarded as a transition element.
- (ii) Cr^{2+} is a stronger reducing agent than Fe^{2+} in a aqueous solution .
9. Calculate the number of unpaired electrons in the following gaseous ions Mn^{3+} , Cr^{3+} , V^{3+} and Ti^{3+} . Which one of these is the most stable in aqueous solution?

10. Use Hund's rule to derive the electronic configuration of Ce^{3+} ion and calculate its magnetic moment on the basis of 'spin only' formula.
11. Calculate the 'spin only' magnetic moment of $\text{M}(\text{aq})^{2+}$ ion. $Z = 27$
12. (i) Calculate the magnetic moment of a divalent ion in aqueous solution $[\text{Fe}(\text{H}_2\text{O})_6]^{2+}$, if atomic number of Fe is 26.
 (ii) Although fluorine is more electronegative than oxygen, but the ability of oxygen to stabilise higher oxidation states exceeds that of fluorine. Why?
 (iii) Although Cr^{3+} and Co^{2+} ions have same number of unpaired electrons but the magnetic moment of Cr^{3+} is 3.87 BM and that of Co^{2+} is 4.87 BM. Give reason.
13. Give reasons
 (i) E° value for $\text{Mn}^{3+}/\text{Mn}^{2+}$ couple is much more positive than that for $\text{Fe}^{3+}/\text{Fe}^{2+}$
 (ii) Iron has higher enthalpy of atomisation than that of copper.
 (iii) Sc^{3+} is colourless in aqueous solution whereas Ti^{3+} is coloured.
- 14 Account for the Following:
 a) $[\text{Ni}(\text{CN})_4]^{2-}$ ion with square planar structure is diamagnetic and the $[\text{NiCl}_4]^{2-}$ ion with tetrahedral structure is paramagnetic.
 b) $[\text{NiCl}_4]^{2-}$ is paramagnetic while $[\text{Ni}(\text{CO})_4]$ is diamagnetic though both are tetrahedral.
 c) $[\text{Fe}(\text{H}_2\text{O})_6]^{3+}$ is strongly paramagnetic while $[\text{Fe}(\text{CN})_6]^{3-}$ is weakly paramagnetic.
 d) $[\text{Fe}(\text{H}_2\text{O})_6]^{3+}$ has a magnetic moment value of 5.92 BM whereas $[\text{Fe}(\text{CN})_6]^{3-}$ has a value of only 1.74 BM.
 e) $[\text{Co}(\text{NH}_3)_6]^{3+}$ is an inner orbital complex whereas $[\text{Ni}(\text{NH}_3)_6]^{2+}$ is an outer complex.
 f) $[\text{Cr}(\text{NH}_3)_6]^{3+}$ is paramagnetic while $[\text{Ni}(\text{CN})_4]^{2-}$ is diamagnetic
 g) A solution of $[\text{Ni}(\text{H}_2\text{O})_6]^{2+}$ is green but a solution of $[\text{Ni}(\text{CN})_4]^{2-}$ is colourless
 h) $[\text{Fe}(\text{CN})_6]^{3-}$ and $[\text{Fe}(\text{H}_2\text{O})_6]^{3+}$ are of different colours in dilute solutions

COORDINATION COMPOUNDS

1. Using IUPAC norms, write the formulae for the following
 (i) Tetrahydroxozincate(II)
 (ii) Potassium tetrachloridopalladate(II)
 (iii) Diamminedichloridoplatinum(II)
 (iv) Potassium tetracyanonickelate(II)
 (v) Pentaamminenitrito-O-cobalt(III)
 (vi) Hexaamminecobalt(III) sulphate
2. (i) Write the electronic configuration of iron ion in the following complex ion and predict its magnetic behaviour : $[\text{Fe}(\text{H}_2\text{O})_6]^{2+}$
 (ii) Write the IUPAC name of the coordination complex:
 $[\text{CoCl}_2(\text{en})_2]\text{NO}_3$.
3. (i) On the basis of crystal field theory explain why $\text{Co}(\text{III})$ forms paramagnetic octahedral complex with weak field ligands whereas it forms diamagnetic octahedral complex with strong field ligands.
 (ii) Give the electronic configuration of the following complexes on the basis of crystal field splitting theory
 $[\text{CoF}_6]^{3-}$, $[\text{Fe}(\text{CN})_6]^{4-}$ and $[\text{Cu}(\text{NH}_3)_6]^{2+}$

- 4 The hexaaquamanganese (II) ion contains five unpaired electrons, while the hexacyano ion contains only one paired electron. Explain using crystal field theory.
5. Using crystal field theory, draw energy level diagram, write electronic configuration of the central metal atom or ion and determine the magnetic moment value in the following.
- (i) $[\text{CoF}_6]^{3-}$, $[\text{Co}(\text{H}_2\text{O})_6]^{2+}$ $[\text{Co}(\text{CN})_6]^{3-}$ and
- (ii) $[\text{FeF}_6]^{3-}$, $[\text{Fe}(\text{H}_2\text{O})_6]^{2+}$ $[\text{Fe}(\text{CN})_6]^{4-}$
6. (i) $[\text{Cr}(\text{NH}_3)_6]^{3+}$ is paramagnetic while $[\text{Ni}(\text{CN})_4]^{2-}$ is diamagnetic. Explain, why?
- (ii) $[\text{Fe}(\text{CN})_6]^{4-}$ and $[\text{Fe}(\text{H}_2\text{O})_6]^{2+}$ are of different colours in dilute solutions. Why?
7. Using valence bond theory, explain the following in relation to the complexes given below
- $[\text{Mn}(\text{CN})_6]^{3-}$, $[\text{Co}(\text{NH}_3)_6]^{3+}$ $[\text{Cr}(\text{H}_2\text{O})_6]^{3+}$
- (i) Type of hybridisation.
- (ii) Inner or outer orbital complex.
- (iii) Magnetic behaviour.
- (iv) Spin only magnetic moment value.
- 8 Why do compounds having similar geometry have different magnetic moment?
9. Give postulates of Werner's theory.
10. What are the various factors affecting crystal field splitting?

ALDEHYDES KETONES AND CARBOXYLIC ACIDS

- 1 Name the electrophile produced in the reaction of benzene with benzoyl chloride in the presence of anhydrous AlCl_3
- 2 Write the equations involved in the following reactions
- (i) Wolf-Kishner reduction
- (ii) Etard reaction
- 3 How do you convert the following?
- (i) Ethanal to propanone
- (ii) Toluene to benzoic acid
4. An organic compound with molecular formula $\text{C}_9\text{H}_{10}\text{O}_9$, forms 2,4-DNP derivative, reduces Tollen's reagent and undergoes Cannizzaro reaction. On vigorous oxidation, it gives 1,2-benzene dicarboxylic acid. Identify the compound.
- 5 Arrange the following in the increasing order of their property indicated (any 2):
- a. Benzoic acid, Phenol, Picric acid, Salicylic acid (pK_a values).
- b. Acetaldehyde, Acetone, Methyl tert butyl ketone (reactivity towards NH_2OH).
- c. ethanol, ethanoic acid, benzoic acid (boiling point)
- 6 An alkene 'A' (Mol. formula C_5H_{10}) on ozonolysis gives a mixture of two compounds 'B' and 'C'. Compound 'B' gives positive Fehling's test and also forms iodoform on treatment with I_2 and NaOH . Compound 'C' does not give Fehling's test but forms iodoform. Identify the compounds A, B and C. Write the reaction for ozonolysis and formation of iodoform from B and C.
7. (i) Give reasons :
- (a) HCHO is more reactive than $\text{CH}_3 - \text{CHO}$ towards addition of HCN .
- (b) pK_a of $\text{O}_2\text{N} - \text{CH}_2 - \text{COOH}$ is lower than that of $\text{CH}_3 - \text{COOH}$.
- (c) Alpha hydrogen of aldehydes and ketones is acidic in nature.

(ii) Give simple chemical tests to distinguish between the following pairs of compounds :

(a) Ethanal and Propanal

(b) Pentan-2-one and Pentan-3-one

8 . How will you bring the following conversions in not more than two steps :

(a) Propanone to propene

(b) Benzyl chloride to phenyl ethanoic acid

9 (ii) Give simple chemical tests to distinguish between the following pairs of compounds:

(a) Benzaldehyde and Benzoic acid

(b) Propanal and Propanone

10 . (i) How will you convert:

(a) Benzene to acetophenone

(b) Propanone to 2-Methylpropan-2-ol

(ii) Give reasons:

(a) Electrophilic substitution in benzoic acid takeplace at meta-position.

(b) Carboxylic acids are higher boiling liquids than aldehydes, ketones and alcohols of comparable molecular masses.

(c) Propanal is more reactive than propanone in nucleophilic addition reactions.

11. Arrange the following compounds in the increasing order of their boiling points :

CH_3CHO , $\text{CH}_3\text{CH}_2\text{OH}$, CH_3OCH_3 , CH_3COOH

12 Draw the structures of the following derivatives :

(a) The 2, 4-Dinitrophenylhydrazone of benzaldehyde,

(b) Acetaldehyde dimethyl acetal

(c) Cyclopropanone oxime.

13 (i) Give a plausible explanation for each one of the following :

(a) Although phenoxide ion has more number of resonating structures than carboxylate ion, carboxylic acid is a stronger acid than phenol.

(b) There are two $-\text{NH}_2$ groups in semicarbazide. However, only one is involved in the formation of semicarbazones.

(ii) Carry out the following conversions in not more than two steps :

(a) Phenyl magnesium bromide to benzoic acid.

(b) Acetaldehyde to But-2-enal.

(c) Benzene to m-Nitroacetophenone. B.

14 ACCOUNT FOR THE FOLLOWING:

1. Aldehydes and Ketones have lower boiling point than alcohols.

2. Aldehydes are more reactive than Ketones towards Nucleophilic addition reaction

3. Cyclohexanone forms cyanohydrin in good yield but 2,2,6 – tri methylcyclohexanone does not.

4. There are two $-\text{NH}_2$ group in semi carbazide however only one is involved in the formation of semi carbazones.

5. During the preparation of esters from a carboxylic acid and an alcohol in the presence of an acid catalyst, the water or the ester should be removed as fast as it is formed.

6. Melting Point of an acid with even number of carbon atoms higher than those of its neighbours with odd number of carbon atoms
 7. It is necessary to control the pH during the reaction of aldehydes and ketones with ammonia derivatives.
 8. Formaldehyde does not take part in Aldol condensation.
 9. Benzaldehyde gives a positive test with Tollens reagent but not with Fehling and Benedict's solution.
 10. Carboxylic acids do not give the characteristic reactions of carbonyl group.
 11. Chloroacetic acid is stronger than acetic acid.
 12. The boiling points of aldehydes and ketones are higher than hydrocarbons and ethers of comparable molecular masses.
 13. The lower members of aldehydes and ketones such as methanal, ethanal and propanone are miscible with water in all proportions.
 14. Would you expect benzaldehyde to be more reactive or less reactive in nucleophilic addition reactions than propanal.
 15. Carboxylic acids are higher boiling liquids than aldehydes, ketones and even alcohols of comparable molecular masses.
 16. Aliphatic carboxylic acids having up to four carbon atoms are miscible in water.
 17. Carboxylic acids are more acidic than phenols.
 18. Although phenoxide ion has more number of resonating structures than carboxylate ion, carboxylic acid is a stronger acid than phenol.
 19. Electron withdrawing groups increase the acidity of carboxylic acids.
 20. Electron donating groups decrease the acidity of carboxylic acids.
 21. Arrange the following compounds in increasing order of acid strength.
 (i) $\text{CH}_3\text{CH}_2\text{CH}(\text{Br})\text{COOH}$, $\text{CH}_3\text{CH}(\text{Br})\text{CH}_2\text{COOH}$, $(\text{CH}_3)_2\text{CHCOOH}$, $\text{CH}_3\text{CH}_2\text{CH}_2\text{COOH}$
 (ii) Benzoic acid, 4-Nitrobenzoic acid, 3,4-Dinitrobenzoic acid, 4-Methoxybenzoic acid (acid strength)
 22. Which acid of each pair shown here would you expect to be stronger
 ?(i) $\text{CH}_3\text{CO}_2\text{H}$ or $\text{CH}_2\text{FCO}_2\text{H}$ (ii) $\text{CH}_2\text{FCO}_2\text{H}$ or $\text{CH}_2\text{ClCO}_2\text{H}$ (iii) $\text{CH}_2\text{FCH}_2\text{CH}_2\text{CO}_2\text{H}$ or $\text{CH}_3\text{CHFCH}_2\text{CO}_2\text{H}$.
15. Write short notes on following :

1. Aldol Condensation
2. Cross Aldol Condensation
3. Cannizzaro Reaction
4. Clemmensen Reaction
5. Wolf Kishner Reaction
6. Rosenmund Reaction
7. Etard Reaction
8. Stephen Reaction
9. Gatterman-Koch reaction:
10. Ozonolysis
11. Esterification
12. Decarboxylation
13. Hell Volhard Zelinsky
14. Acetylation

AMINES

1 (i) Write an isomer of C_3H_9N which gives foul smell of isocyanide when treated with chloroform and ethanolic NaOH

(ii) Write an isomer of C_3H_9N which does not react with Hinsberg reagent.

2 (i) Arrange the following in increasing order of boiling points.

$(CH_3)_3N$, C_2H_5OH , $C_2H_5NH_2$

(ii) Arrange the following in increasing order of base strength in gas phase:

$(C_2H_5)_3N$, $C_2H_5NH_2$, $(C_2H_5)_2NH$

3(i) Arrange the following in decreasing order of solubility in water:

$(CH_3)_3N$, $(CH_3)_2NH$, CH_3NH_2

(ii) Arrange the following in decreasing order of the basic character:

$C_6H_5NH_2$, $(CH_3)_3N$, $C_2H_5NH_2$

4 Write the chemical equations involved in the following reactions:

(i) Hoffmann-bromamide degradation reaction,

(ii) Carbylamine reaction.

5 Why does acetylation of $-NH_2$ group of aniline reduce its activating effect ?

6 Give reasons:

(i) Aniline is a weaker base than cyclohexylamine.

(ii) It is difficult to prepare pure amines by ammonolysis of alkyl halides.

(iii) Aniline does not undergo Friedel Crafts reaction.

6. Give two chemical tests to identify primary, secondary and tertiary amines.

8. How do you convert the following :

(a) N-phenylethanamide to p-bromoaniline

(b) Benzoic acid to aniline

9 Account for the following:

a. Aniline cannot be prepared by the ammonolysis of chlorobenzene under normal conditions.

b. N-ethylethanamine boils at 329.3K and butanamine boils at 350.8K, although both are isomeric in nature.

c. Acylation of aniline is carried out in the presence of pyridine.

10 Give a CHEMICAL TEST to distinguish between following pair of organic compounds

a. Methylamine and dimethylamine

b. Ethylamine and aniline

c. Aniline and benzylamine

d. Aniline and N-methylaniline

e. N-methyl Propane -2-amine and N-ethyl N-methyl ethanamine

f. Secondary and tertiary amines

g. 10, 20, & 30 Amines

h. $C_6H_5NH_2$ & $C_6H_5NHCH_3$

11. Write chemical equations for the following conversions:

a. CH_3-CH_2-Cl into $CH_3-CH_2-CH_2-NH_2$

b. $C_6H_5-CH_2-Cl$ into $C_6H_5-CH_2-CH_2-NH_2$

- c. Benzene into aniline
- d. Benzene into N, N-dimethylaniline
- e. Cl-(CH₂)₄-Cl into hexan-1,6-diamine
- f. Ethanoic acid into methanamine
- g. Hexanenitrile into 1-aminopentane
- h. Methanol to ethanoic acid
- i. Ethanamine into methanamine
- j. Ethanoic acid into propanoic acid
- k. Methanamine into ethanamine
- l. Nitromethane into dimethylamine
- m. Propanoic acid into ethanoic acid
- n. Nitrobenzene to benzoic acid
- o. Benzene to m-bromophenol
- p. Benzoic acid to aniline
- q. Aniline to 2,4,6-tribromofluorobenzene
- r. Benzyl chloride to 2-phenylethanamine
- s. Chlorobenzene to p-chloroaniline
- t. Aniline to p-bromoaniline
- u. Benzamide to toluene
- v. Aniline to benzyl alcohol.

11 WRITE FOLLOWING NAME REACTIONS :

1. Hofmann's bromamide reaction
2. Ammonolysis
3. Gabriel phthalimide synthesis.
4. Carbylamine reaction
5. Diazotisation
6. Coupling reaction
7. Acetylation
8. Benzoylation

Computer Science

Code No. 083

QUESTION BANK Class XII (2021-22) TERM 2

UNIT-1 : Data Structure – 02 Marks Questions with Answers

1	Give any two characteristics of stacks.																						
Ans	Characteristics of Stacks: It is a LIFO data structure, The insertion and deletion happens at one end i.e. from the top of the stack																						
2	Expand the following: LIFO, FIFO																						
Ans	LIFO: Last-In First-Out FIFO: First-In First-Out																						
3	Give few applications areas of stack.																						
Ans	Expression evaluation Backtracking (game playing, finding paths, exhaustive searching). Memory management, run-time environment for nested language features.																						
4	Evaluate the following postfix notation of expression, Show status of stack after every operation. 12,2,7,34,20,-, +,5, +																						
Ans		<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Input Symbol</th> <th style="text-align: center;">Stack Content</th> </tr> </thead> <tbody> <tr><td style="text-align: center;">12</td><td style="text-align: center;">12</td></tr> <tr><td style="text-align: center;">2</td><td style="text-align: center;">12, 2</td></tr> <tr><td style="text-align: center;">/</td><td style="text-align: center;">6</td></tr> <tr><td style="text-align: center;">34</td><td style="text-align: center;">6, 34</td></tr> <tr><td style="text-align: center;">20</td><td style="text-align: center;">6,34,20</td></tr> <tr><td style="text-align: center;">-</td><td style="text-align: center;">6,14</td></tr> <tr><td style="text-align: center;">+</td><td style="text-align: center;">20</td></tr> <tr><td style="text-align: center;">5</td><td style="text-align: center;">20, 5</td></tr> <tr><td style="text-align: center;">+</td><td style="text-align: center;">25</td></tr> </tbody> </table>	Input Symbol	Stack Content	12	12	2	12, 2	/	6	34	6, 34	20	6,34,20	-	6,14	+	20	5	20, 5	+	25	
Input Symbol	Stack Content																						
12	12																						
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+	20																						
5	20, 5																						
+	25																						
5	Evaluate The Following Postfix Notation Of Expression. Show status of stack after every operation. 12,2, *, 24,20, -, +, 8, -																						
Ans	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 25%; text-align: center;">Scanned</th> <th style="width: 25%; text-align: center;">Stack</th> <th style="width: 50%; text-align: center;">Expression</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>			Scanned	Stack	Expression																	
Scanned	Stack	Expression																					

Element	Status	
12	12	---
2	12, 2	
*	24	12*2
24	24,24	
20	24, 24, 20	
-	24, 4	24 - 20
+	28	24 + 4
8	28 , 8	
-	20	28 - 8

Result- 80

Stack, operations on stack (push & pop), implementation of stack using list-
03 Marks Questions with Answers

1 Nivedita has started a new year's resolution to read 12 non fiction books by the end of 2022. For this purpose she has bought 20 such books. She stores the data in a dictionary as book_name, rating as key, value pair. Help her out a bit to organize her collection with help of Stack Data Structure.

Write a program, with separate user defined functions to perform the following operations:

- Push the keys (book_name) of the dictionary into a stack, where the corresponding value (rating) are more than 8 .
- Pop and display the content of the stack. For example: If the sample content of the dictionary is as follows:
B={"AI 2041: Ten Visions for Our Future":7.9, "Beginners: The Transformative Joy of Lifelong Learning":8.5, "Bravey: Chasing Dreams, Befriending Pain, and Other Big Ideas":9, "Chatter: The Voice in Our Head, Why It Matters, and How to Harness It":8.2, "The Code Breaker: Jennifer Doudna, Gene Editing, and the Future of the Human Race":7.5}

The output from the program should be:
Beginners: The Transformative Joy of Lifelong Learning,
Bravey: Chasing Dreams, Befriending Pain, and Other Big Ideas,
Chatter: The Voice in Our Head, Why It Matters, and How to Harness It

OR

Raghav has created a vocabulary list. You need to help him create a program with separate user defined functions to perform the following operations based on this list.

- Traverse the content of the list and push the entries having less than 7 characters into a stack.
- Pop and display the content of the stack.

For Example:
If the sample Content of the list is as follows:
W=['Elucidate', 'Haughty', 'Pacify', 'Quip', 'Rapport', 'Urbane', 'Young', 'Zenith']

Sample Output of the code should be:
Pacify,Quip,Urbane,Young,Zenith

Ans	<pre> B={" AI 2041":7.9, "Beginners":8.5, "Bravey":9, "Chatter":8.2, "The Code Breaker":7.5} def PUSH(S,N): S.append(N) def POP(S): if S!=[]: return S.pop() else: return None BList=[] for i in B: if B[i]>8: PUSH(BList,i) while True: if BList!=[]: print(POP(BList),end=" ") else: break </pre>	<p style="text-align: center;"><u>OR</u></p> <pre> W=['Elucidate', 'Haughty', 'Pacify', 'Quip', 'Rapport', 'Urbane', 'Young','Zenith'] def PUSH(S,W): S.append(W) def POP(S): if S!=[]: return S.pop() else: return None WList=[] for i in W: if len(i)<7: PUSH(WList,i) while True: if WList!=[]: print(POP(WList),end=" ") else: break </pre>
-----	---	---

2 BCCI has created a dictionary containing top players and their runs as key value pairs of cricket team. Write a program, with separate user defined functions to perform the following operations:

- Push the keys (name of the players) of the dictionary into a stack, where the corresponding value (runs) is greater than 49.
- Pop and display the content of the stack.

For example:
If the sample content of the dictionary is as follows:
SCORE={"KAPIL":40, "SACHIN":55, "SAURAV":80, "RAHUL":35, "YUVRAJ":110, }

The output from the program should be:
SACHIN SAURAV YUVRAJ

OR

Vikram has a list containing 10 integers. You need to help him create a program with separate user defined functions to perform the following operations based on this list.

- Traverse the content of the list and push the ODD numbers into a stack.
- Pop and display the content of the stack.

For Example:
If the sample Content of the list is as follows:
N=[12, 13, 34, 56, 21, 79, 98, 22, 35, 38]

Sample Output of the code should be:
13,21,89,35

Ans	<pre> SCORE={"KAPIL":40, "SACHIN":55, "SAURAV":80, "RAHUL":35, "YUVRAJ":110, } </pre>	<p style="text-align: center;"><u>OR</u></p> <pre> N=[12, 13, 34, 56, 21, 79, 98, 22,35, 38] </pre>
-----	---	---

	<pre> def PUSH(S,R): S.append(R) def POP(S): if S!=[]: return S.pop() else: return None #Message ST=[] for k in SCORE: if SCORE[k]>49: PUSH(ST,k) while True: if ST!=[]: print(POP(ST),end=" ") else: break </pre>	<pre> def PUSH(S,N): S.append(N) def POP(S): if S!=[]: return S.pop() else: return None ST=[] for k in N: if k%2!=0: PUSH(ST,k) while True: if ST!=[]: print(POP(ST),end=" ") else: break </pre>
--	---	--

3 Write Push (contents) and Pop (contents) methods in Python to add numbers and remove numbers considering them to act as Push and Pop operations of stack.

Ans

```

def Push (contents) :
    if(len(stack) >= limit) :
        print("Stack Overflow!")
    else :
        stack . append (contents)
        print ("Stack after Push", stack)
def Pop ( ) :
    if (len (stack) <= 0 ) :
        print("Stack Underflow!")
        return 0
    else :
        return stack. Pop( )

```

UNIT 2 TOPIC: Evolution of networking: introduction to computer networks, evolution of networking (ARPANET,NSFNET, INTERNET)

1	List any 4 services provided by the Internet.	1
Ans	Email, Instant-Messaging, Sharing of Devices and Directory Sharing etc.	
2	What is interspace and how is it different from the Internet?	1
Ans	InterSpace is a client-server software program, allows multiple users to communicate online with real-time audio, video or text chat in dynamic 3D environments. It provides the most advanced form of communication available on the Internet today. InterSpace is a vision of what the Internet will become in the future.	
3	While transferring data on the internet, the message is divided into small units called as _____	1
Ans	Packets	

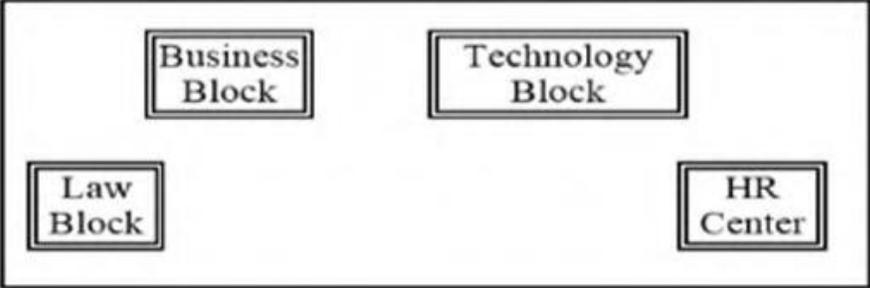
4	Name the device responsible for converting the digital signal to continuous (analog) signal for transmission over telephone lines.	1												
Ans	Modem													
5	What is the name given to the unique address assigned to each NIC?	1												
Ans	MAC (Media Access Control) Address also called as the physical address of a device.													
6	Explain the 80:20 rule.	1												
Ans	The 80:20 rule states that 80% of the traffic in any network segment should be local and only 20% of the traffic should leave that segment for efficient traffic management. It simply means that we should install the server at the site/building containing the maximum number of computers.													
TOPIC: Data communication terminologies: concept of communication, components of data communication (sender, receiver, message, communication media, protocols), measuring capacity of communication media (bandwidth, data transfer rate), IP address, switching techniques (Circuit switching, Packet switching)														
1	What are the components used in communication?	1												
Ans	Sender, receiver, message, protocol and transmission media													
2	What do you mean by a Protocol?	1												
Ans	It is a set of rules or procedures for transmitting data between electronic devices.													
3	What is the full form of IP?	1												
Ans	Internet Protocol													
4	How many bits are used in an IPv4 address and IPv6 address?	1												
Ans	32 bits and 128 bits													
5	Differentiate circuit switching and packet switching (mention any 2).	2												
Ans	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>S.no</th> <th>Circuit Switching</th> <th>Packet Switching</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Connection-oriented</td> <td>Connectionless</td> </tr> <tr> <td>2</td> <td>The bandwidth used is fixed</td> <td>The bandwidth used is dependent on actual data transmitted</td> </tr> <tr> <td>3</td> <td>Preferred when the communication is long and continuous</td> <td>It's beneficial for transferring data that doesn't require real-time responsiveness</td> </tr> </tbody> </table>	S.no	Circuit Switching	Packet Switching	1	Connection-oriented	Connectionless	2	The bandwidth used is fixed	The bandwidth used is dependent on actual data transmitted	3	Preferred when the communication is long and continuous	It's beneficial for transferring data that doesn't require real-time responsiveness	
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1	Connection-oriented	Connectionless												
2	The bandwidth used is fixed	The bandwidth used is dependent on actual data transmitted												
3	Preferred when the communication is long and continuous	It's beneficial for transferring data that doesn't require real-time responsiveness												
6	List the types of communication media with examples of each.	2												
Ans	1. Wired Communication Media - Twisted Pair Cable, Coaxial Cable, Optical Fibre Cable 2. Wireless Communication Media - Microwave, Radio Waves, Infrared, Satellite Communication													
7	What is an IP (logical) address?	1												
Ans	An IP address is a unique address assigned to each device connected to a computer network.													
8	Give an example of an IPv4 address.	1												
Ans	An IPv4 address is a 32-bit address expressed in decimal notation as x.x.x.x where each x is													

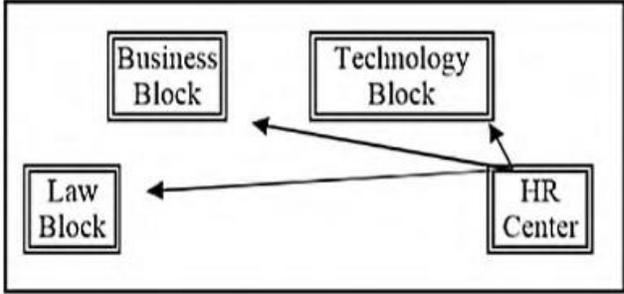
	an integer between 0 and 255. Example: 192.0.2.188										
9	Which of the following communication media require(s) line-of-sight for communication? Microwave, Radio waves, Infrared	1									
Ans	Microwaves, Infrared										
10	Which of the following communication media can penetrate solid objects? Microwave, Radio waves, Infrared										
Ans	Radio waves										
TOPIC: Transmission media: Wired communication media (Twisted pair cable, Co-axial cable, Fiber-optic cable), Wireless media (Radio waves, Micro waves, Infrared waves)											
1	Write name of guided and unguided media.	1									
Ans	Guided Media : Twisted pair, coaxial cable , Fiber Optic Cable Unguided Media : Radio waves, Micro waves, Infrared waves										
2	Why fiber optic transmission media is faster as compared to other wired transmission media?	1									
Ans	Fiber optic transmits data as light, while other wired media transfer data as electricity. Light travels exponentially faster than electricity so fiber optic transmission media is faster.										
3	Out of the following, identified the unguided communication media ? Infrared, Coaxial Cable, Optical Fibre, Microwave, Radio waves	1									
Ans	Infrared, Microwave, Radio waves										
4	Write the two characteristics of Wi-fi	1									
Ans	Convenient and anywhere technology. Support Secure wireless communication										
5	Arrange the following communication media in the ascending order of their transmission speed. Twisted Pair Cable , Telephone Cable , Optical Fibre Cable	1									
Ans	Telephone Cable , Twisted Pair Cable , Optical Fibre Cable										
6	Rearrange the following terms in increasing order of data transfer rates Gbps ,Mbps, Tbps, Kbps,Bps	1									
Ans	Bps, Kbps, Mbps, Gbps, Tbps										
<u>TOPIC:Network devices (Modem, Ethernet card, RJ45, Repeater, Hub, Switch, Router, Gateway, WIFI card)</u>											
1	What is a network device? Give some examples of network devices.	2									
Ans	Hardware devices that are used to connect computers, printers, fax machines and other electronic devices to a network are called network devices. E.g. Modem, Ethernet card, RJ45, Repeater, Hub, Switch, Router, Gateway, WIFI card.										
2	What is Ethernet card? How Ethernet Differs from Wi-Fi Card?	2									
Ans	An Ethernet card is a kind of network adapter. These adapters support the ethernet standard for high-speed network connections via cables.										
	<table border="1"> <thead> <tr> <th></th> <th>Wi-Fi Card</th> <th>Ethernet Card</th> </tr> </thead> <tbody> <tr> <td>Speed</td> <td>Slow data transfer speed</td> <td>Faster data transfer speed</td> </tr> <tr> <td>Reliability</td> <td>Suffers from signal interference</td> <td>Delivers a consistent speed</td> </tr> </tbody> </table>		Wi-Fi Card	Ethernet Card	Speed	Slow data transfer speed	Faster data transfer speed	Reliability	Suffers from signal interference	Delivers a consistent speed	
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Speed	Slow data transfer speed	Faster data transfer speed									
Reliability	Suffers from signal interference	Delivers a consistent speed									

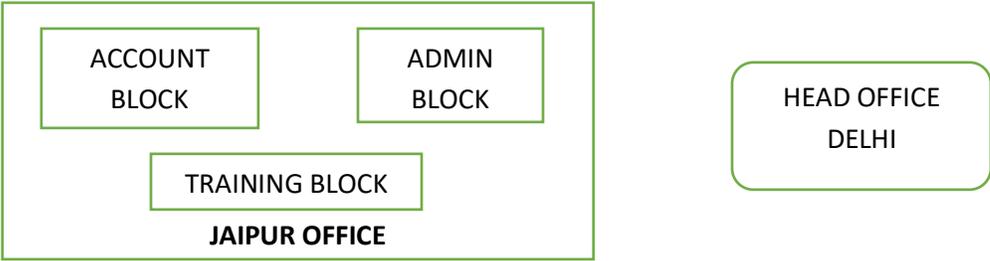
		to many environmental factors		
	Security	Data flow needs to be encrypted	Data doesn't required to be encrypted	
	Deployment	Easy to install and deploy	Cable installation infrastructure is required	
3	What is RJ45 connector? where it is used?			2
Ans	RJ45 stands for Registered Jack-45. It is a eight wire connector. RJ45 connector is used to connect computers onto a Ethernet cable/Local Area Network(LAN).			
4	Define repeaters with its two types			2
Ans	<p>Repeaters are used to amplify the signals, when they are transported over a long distance. Repeaters are of two types</p> <p>(i) Amplifier It amplifies or boosts the incoming signals. So, it amplifies both the signal and any concurrent noise.</p> <p>(ii) Signal repeater It only amplifies the signal and filters out the noise signals. So, we get only the clear signal at the receiver end. Repeaters may be included after every 100 mtrs (approx) distance.</p>			
5	Expand the following i. MODEM ii. RJ45			2
Ans	i. MODEM - MODulator DEModulator ii. RJ45 - Registered Jack-45			
6	Mention the appropriate networking device for following conditions.			2
	(i) It is a hardware device which is used to amplify the signals when they are transported over a long distance.			
	(ii) It is a device that converts digital signal to analog signal and vice versa			
Ans	i. Repeater ii. MODEM			
7	How are active hubs different from passive hubs?			2
Ans	Active Hub		Passive Hub	
	Active Hubs electrically amplify the signal as it moves from one connected device to another		Passive Hubs does not amplify the signals	
	Active hubs are used like repeater to extend the length of a network		Passive hubs can not used as a repeater	
	Transmission rate is high		Transmission rate is slow	
8	What is a Switch?			
Ans	<p>A switch is called a smart hub. Provides multiple connections</p> <p>A device that filters and forwards packets between LAN segments.</p> <p>Switch passes the frame to a specific port because it keep a record of MAC address</p>			2
9	What is Gateway ?			2
Ans	A gateway is a network point that acts as an entrance to another network. It is used to connect two dissimilar networks			
10	What is a Bridge ?			2
Ans	A device that connects two local-area networks (LANs), or two segments of the same LAN that use the same protocol, such as Ethernet.			
11	What is the Router ?			2

Ans	A router is a device that forwards data packets along networks. A router is connected to at least two networks, commonly two LANs or WANs. Routers are located at gateways, the places where two or more networks connect. A router acts as a dispatcher, choosing the best path for information to travel so it's received quickly.	
12	Which of the following (i) is not a broadcast device (ii) offers a dedicated bandwidth ? (a) Repeater (b) Bridge (c) Hub (d) Switch	2
Ans	(i) Bridge is not a broadcast device as it filters traffic depend upon the receivers MAC address (ii) Switch Offer dedicated bandwidth	
13	What out of the following, will you use to have an audio visual chat with an expert sitting in a faraway place to fix-up a technical issue (i) Email (ii) VoIP (iii) FTP	1
Ans	(ii) VoIP	

TOPIC: Network topologies and Network types: types of networks (PAN, LAN, MAN, WAN), networking topologies (Bus, Star, Tree)

1	<p>TPU University is setting up its academic blocks at Udaipur and is planning to set up a network. The University has 3 academic blocks and one Human Resource Centre as shown in the diagram below:</p>  <table border="1" data-bbox="180 1304 1422 1583"> <tr> <td colspan="2">Center to Center distances between various blocks/center is as follows</td> <td colspan="2">No of computers in various blocks/center is as follows:</td> </tr> <tr> <td>Law Block to Business Block</td> <td>40m</td> <td>Law Block</td> <td>15</td> </tr> <tr> <td>Law Block to Technology Block</td> <td>80m</td> <td>Technology Block</td> <td>40</td> </tr> <tr> <td>Law Block to HR Centre</td> <td>105m</td> <td>HR Centre</td> <td>115</td> </tr> <tr> <td>Business Block to HR Centre</td> <td>30m</td> <td>Business Block</td> <td>25</td> </tr> <tr> <td>Technology Block to HR Centre</td> <td>15m</td> <td></td> <td></td> </tr> </table> <p>a) Suggest an ideal layout for connecting these blocks/centers for wired connectivity. b) Which device will you suggest to be placed/installed in each of these blocks/centers to efficiently connect all the computers within these blocks/centers. c) Suggest the placement of a Repeater in the network with justification. d) The university is planning to connect its admission office in Delhi, which is more than 780 km from the university. Which type of network out of LAN, MAN, or WAN will be formed? Justify your answer</p>	Center to Center distances between various blocks/center is as follows		No of computers in various blocks/center is as follows:		Law Block to Business Block	40m	Law Block	15	Law Block to Technology Block	80m	Technology Block	40	Law Block to HR Centre	105m	HR Centre	115	Business Block to HR Centre	30m	Business Block	25	Technology Block to HR Centre	15m			4
Center to Center distances between various blocks/center is as follows		No of computers in various blocks/center is as follows:																								
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Ans	<p>a)</p> 	<p>b). Hub / Switch</p> <p>c). Repeater may be placed when the distance between 2 buildings is more than 100 meters.</p> <p>d). WAN, as the given distance is more than the range of LAN and MAN.</p>
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2	<p>Unicorp Tech Training Ltd. is a Delhi based organization which is expanding its office set-up to Jaipur. At Jaipur office , they are planning to have 3 different blocks for Admin, Training and Accounts related activities. Each block has a number of computers, which are required to be connected in a network for communication, data and resource sharing. As a network consultant, you have to suggest the best network related solutions for them for issues/problems raised by them in (i) to (iv), as per the distances between various blocks/locations and other given parameters.</p> <div style="text-align: center;">  </div> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2">Shortest distances between various blocks/locations</th> <th colspan="2">Number of computers installed at various blocks are as follows :</th> </tr> </thead> <tbody> <tr> <td>Admin Block to Accounts Block</td> <td style="text-align: center;">310M</td> <td>Admin Block</td> <td style="text-align: center;">50</td> </tr> <tr> <td>Accounts Block to Training Block</td> <td style="text-align: center;">160M</td> <td>Accounts Block</td> <td style="text-align: center;">40</td> </tr> <tr> <td>Admin Block to Training Block</td> <td style="text-align: center;">190M</td> <td>Training Block</td> <td style="text-align: center;">130</td> </tr> <tr> <td>Delhi Head Office to Jaipur Office</td> <td style="text-align: center;">700KM</td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>(i) Suggest the most appropriate block/location to house the SERVER in the JAIPUR office (out of the 3blocks) to get the best and effective connectivity. Justify your answer.</p> <p>(ii) Suggest the best wired medium and draw the cable layout (Block to Block) to efficiently connect various blocks within the JAIPUR office compound.</p> <p>(iii) Suggest a device/software and its placement that would provide data security for the entire network of the JAIPUR office.</p> <p>(iv) Suggest a device and the protocol that shall be needed to provide wireless Internet access to all</p>	Shortest distances between various blocks/locations		Number of computers installed at various blocks are as follows :		Admin Block to Accounts Block	310M	Admin Block	50	Accounts Block to Training Block	160M	Accounts Block	40	Admin Block to Training Block	190M	Training Block	130	Delhi Head Office to Jaipur Office	700KM							4
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	smartphone/laptop users in the JAIPUR office.	
Ans	<p>(i) Training Block – Because it has maximum number of computers. (ii) Best wired medium: Optical Fibre OR CAT5 OR CAT6 OR CAT7 OR CAT8 OR Ethernet Cable</p>  <pre> graph LR A[ACCOUNT BLOCK] --> B[ADMIN BLOCK] A --> C[TRAINING BLOCK] </pre> <p>(iii) Firewall – Placed with the server at the Training Block OR Any other valid device/software name (iv) Device Name: WiFi Router OR WiMax OR RF Router OR Wireless Modem OR RF Transmitter Protocol: WAP OR 802.16 OR TCP/IP OR VOIP OR MACP OR 802.11</p>	
3	Identify the type of topology from the following ?: (i) Each node is connected with the help of a single cable (ii) Each node is connected with the help of independent cable with central switching.	2
Ans	(i) Bus Topology (ii) Star Topology	
4	Mahesh wants to transfer data within a city at very high speed. Write the wired transmission medium and type of network ?.	2
Ans	Wired communication media is Optical Fibre Cable and type of network is MAN (Metropolitan Area Network)	
5	(i) Which type of network (out of LAN, PAN and MAN) is formed when you connect two mobiles using Bluetooth to transfer a video? (ii) Which type of network frame when we connect with our relative in a foreign country?	2
Ans	(i) PAN (Personal Area Network) (ii) WAN (Wide Area Network)	
TOPIC: Network protocol: HTTP, FTP, PPP, SMTP, TCP/IP, POP3, HTTPS, TELNET, VoIP		
1	Which is the most recent version of HTTP protocol?	1
Ans	HTTP/2 (originally named HTTP/2.0)	
2	HTTP (HyperText Transfer Protocol) is a _____ Protocol. (Connection Oriented /Connectionless)	1
Ans	Connectionless (also called stateless)	
3	You want to open the KVS HQ website on a web-browser, which Protocol do you need to access the same?	1
Ans	HTTP (HyperText Transfer Protocol)	
4	Which protocol is generally used to upload web pages to a web server for hosting?	1
Ans	FTP (File Transfer Protocol)	
5	Explain Point to Point Protocol (PPP) protocol.	2
Ans	It is Windows' default Remote Access Service (RAS) protocol and mainly used to encapsulate data to pass through synchronous and asynchronous lines of communication over serial point-to-point	

	connections. It is also known as RFC 1661.	
6	List the two sub-protocol of PPP.	1
Ans	Link Control Protocol (LCP) and Network Control Protocol (NCP).	
7	A Manager of an IT company sends an email to one of his colleagues, requesting him to prepare the balance sheet. Which network protocol is involved during this email communication?	1
Ans	Simple Mail Transfer Protocol (SMTP)	
8	Explain the two models of SMTP Protocols.	1
Ans	The end-to-end model is used to communicate between different organisations . The store and forward model is used within an organisation.	
9	What is the Post Office Protocol v3 (POP3)?	1
Ans	It is used to retrieve emails from a remote mailserver to a local email client which can be read later even when the system is offline. This protocol also removes the mail copy from the mail server once downloaded locally.	
10	Write the full form of HTTP, FTP.	1
Ans	HTTP - HyperText Transfer Protocol FTP - File Transfer Protocol	
11	Write the full form of PPP, SMTP.	1
Ans	ANS PPP - Point to Point Protocol SMTP - Simple Mail Transfer Protocol	
12	Write the full form of TCP/IP, POP3.	1
Ans	TCP/IP - Transmission Control Protocol/Internet Protocol POP3 - Post Office Protocol Version 3	
13	Write the full form of HTTPS, VoIP.	1
Ans	HTTPS - HyperText Transfer Protocol Secure VoIP - Voice Over Internet Protocol	
14	Write the full form of XML and HTML	1
Ans	XML - Extensible Markup Language HTML - HyperText Markup Language	
15	Write the full form of WLL and IMAP	1
Ans	WLL - Wireless local loop IMAP - Internet Message Access Protocol	
16	Write the full form of CDMA and GSM	1
Ans	CDMA - Code Division Multiple Access GSM - Global System for Mobile Communication	
17	Write the full form of LTE and GPRS	1
Ans	LTE - Long Term Evolution GPRS - General Packet Radio Service	
18	Name the softwares that uses the TELNET protocol?	1
Ans	TELNET, AnyDesk, Team Viewer	
19	What type of content can be transferred using the HTTP protocol?	1
Ans	Text, images, audio, video and other multimedia files can be transferred over the web using the HTTP protocol	
20	Explain the 3-way handshake process of TCP protocol.	2
Ans	TCP protocol uses three-way handshake in which the sender first sends the RTS (Request to	

	send) frame After receipt of RTS, the receiver sends the CTS (Clear to send) frame On receipt of CTS, the sender again sends the ACK (Acknowledgement) which signifies the successful receipt of the CTS frame.	
21	Distinguish between HTTP and FTP protocol. (any two)	2
Ans	HTTP	FTP
	It stands for HyperText Transfer Protocol	It stands for File Transfer Protocol
	It is a set of rules that define how web pages are transferred between computers over the internet	It is a set of rules that govern the uploading and downloading of files over the internet
	It uses the Transmission Control Protocol and runs on TCP port 80	It uses the Transmission Control Protocol and runs on TCP port 20(for commands) and 21 (for data)
	It is efficient in transferring small files	It is efficient in transferring large files
	It is a stateless (Connectionless) protocol	It is a stateful(connection-oriented) protocol
	It is faster as compared to FTP	It is slower as compared to HTTP
22	Which out of the following is/are connection-oriented protocol(s)? TCP, IP, HTTP	1
Ans	TCP	
23	Write the port numbers used by the following protocols: HTTP, FTP, SMTP, POP3, HTTPS, TELNET, VoIP	2
Ans	HTTP - Port No. 80 FTP - Port No. 20 for commands and Port no. 21 for data SMTP - Port No. 25 POP3 - Port No. 110 ,HTTPS - Port No. 443 TELNET - Port No. 23 VoIP -Port No. 5060	
24	Ram wants to have a meeting with his team-mates where they can see each other and discuss the new project they have been assigned by the management. Which protocol would be used in this communication?	1
Ans	H.323 and session initiation protocol (SIP)	
25	Tejas wants to download all his emails on his ipad and read them whenever he is free. Which protocol would be used?	1
Ans	POP3	
26	Rani needs to download all the study material regarding her favourite subject from a remote server. Which protocol would she use?	1
Ans	FTP (File Transfer Protocol)	
27	Aman works for an IT company which provides custom-application softwares. One of his clients does not know how to install one such software on his computer. Which protocol would Aman use to assist the client for remote installation of a particular application software?	1
Ans	TELNET (for remote access)	
28	Write the name of the protocol used when- You send an email to another user You read your email	1

Ans	SMTP (Simple Mail transfer protocol) POP3 (Post Office Protocol Version 3)	
29	Dev wants to search for information about esteemed engineering colleges in India. He opens his web browser and types the phrase "Best engineering colleges in India" into the Google Search box. He gets a list of search results in his web browser. Which protocol was used in this task?	1
Ans	HTTPS (HyperText Transfer Protocol Secure)	
TOPIC: Introduction to web services: WWW, Hyper Text Markup Language (HTML), Extensible Markup Language(XML), domain names, URL, website, web browser, web servers, web hosting		
1	What is a Cookie?	1
Ans	Cookies are text files with small pieces of data like a username and password that are used to identify your computer as you use a computer network.	
2	What is the Domain Name Server (DNS)?	1
Ans	Domain Name Server, translates human readable domain names (for example, www.amazon.com) to its corresponding machine readable IP addresses (for example, 192.0.2.44).	
3	What is Web Hosting? List any two Web Hosts Service providers.	2
Ans	Web hosting is an online service that allows customers to publish their website onto the internet. Web host is responsible for making sure that the website is up and running 24x7. It is also a host's job to prevent any security breaches and store all website related files, assets and databases onto the server. Example, IBM, Amazon Web Services (AWS), Bluehost, HostGator and Hostinger etc.	
4	What is the difference between WWW and W3C?	2
Ans	The World Wide Web Consortium (W3C) is the main international standards organisation which develops standards and protocols/guidelines to ensure long-term growth for the World Wide Web; Led by Web inventor and Director Tim Berners-Lee and CEO Jeffrey Jaffe. The World Wide Web, also called the Web, is an information space where documents and other web resources are identified by Uniform Resource Locator, interlinked by hypertext links, and accessible via the Internet.	
5	Write the full form of URL.	1

Ans	Uniform Resource Locator		
6	Identify the following from the URL : https://www.sample.com/cs_books.html Type of protocol being used Name of the server on the Internet Domain Indicator Name of the resource being accessed		2
Ans	HTTPS Server Name - www.sample.com Domain Indicator - com Name of resource being accessed - cs_books.html		
7	What is a web server?		1
Ans	It is a computer that serves web pages as and when they are requested by clients.		
8	Give examples of web servers. (Any two)		1
Ans	Apache HTTP Server, Microsoft IIS (Internet Information Services) Server, Apache Tomcat, NGINX		
9	Give examples of search engines		1
Ans	Google, Bing, Yahoo. DuckDuckGo		
10	Give examples of DNS servers. (Any two)		1
Ans	Google, Quad9, OpenDNS, Cloudflare, Alternate DNS		
11	What is the difference between HTML and XML?(any two)		2
Ans	XML	HTML	
	New tags can be created, Tags are pre-fixed	new tags cannot be created	
	It is case sensitive	It is case insensitive	
	Ordering of tags matters (nesting of tags must be in correct order)	Ordering of tags is immaterial	
	It focuses on structure of data	It focuses on presentation of data	
	Matching opening tags and closing tags must be there	Closing tags are optional	
UNIT-3			
TOPIC: Structured Query Language: introduction, Data Definition Language and Data Manipulation Language, data type (char(n), varchar(n), int, float, date), constraints (not null, unique, primary key), create database, use database, show databases, drop database, show tables, create table, describe table,			
1	Define DDL & DML commands of SQL with example.		2
Ans	DDL: - Data Definition Language (DDL) provides commands for defining relation schemas, deleting relations, creating indexes, and modifying relation schemas. For example: CREATE, ALTER, DROP etc... DML: - Data Manipulation Language (DML) includes commands for manipulating tuples in databases. For example: Insert, Delete, Update commands etc...		

2	A table TEACHER has attributes CODE, NAME, POST, CATEGORY. Write down the command to delete the attribute CATEGORY from this table.	1
Ans	ALTER TABLE Teacher DROP Category;	
3	Consider the following SQL statement. S1: CREATE TABLE employee (eno CHAR(3), name VARCHAR(20)); S2: INSERT INTO employee VALUES ('E01',RAHUL DRAVID); From S1 and S2, which one is DDL and which one is DML?	2
Ans	S1: DDL S2: DML	
4	In SQL, write the query to display the list of tables stored in a database.	2
Ans	SHOW TABLES	
5	In SQL, what is the use of the IS NULL operator?	2
Ans	To check if the column has null value/no value/blank	
6	In SQL, name the clause that is used to display the tuples in ascending/ descending order of an attribute.	1
Ans	ORDER BY	
7	A table ACCOUNTS in the database has 14 columns and 4 records. What is its degree if 2 more rows are added into the table?	1
Ans	14	
8	Write the queries to Create a database named as 'Company' and then Create a Table with use of NOT NULL and Primary Key constraints for following relation definition: Staff (StaffID, FirstName, LastName, IsQualified) where StaffID Char type data with length 5 PRIMARY KEY FirstName varchar type data with length 20 NOT NULL LastName varchar type data with length 15 IsQualified Char type data with length 4	2
Ans	CREATE DATABASE COMPANY; CREATE TABLE Staff (StaffID CHAR (5) PRIMARY KEY, FirstName VARCHAR (20) NOT NULL, LastName VARCHAR (15), IsQualified CHAR(4));	
9	Write a SQL statement to create a table named Country including columns country_id, country_name and region_id and make sure that no duplicate data against column country_id will be allowed at the time of insertion. Attribute Name Data type Constraint country_id char data type of length 4 Should not be empty and should be unique country_name variable length (40) Should not be empty region_id decimal with length (10,0) Should not be empty Write a query to describe the structure of this table after creation?	3
Ans	CREATE TABLE Country (COUNTRY_ID char(4) NOT NULL, COUNTRY_NAME varchar(40) NOT NULL, REGION_ID decimal(10,0) NOT NULL, UNIQUE (COUNTRY_ID)); Desc Country; Or Describe Country;	
10	Write a Query to Create a database named as "COMPANY" and after creating write a query to open it?	3

	<p>Write a SQL statement to create a table named Job under this database company, the table includes columns JOB_ID, JOB_TITLE, MIN_SAL and MAX_SAL, BONUS and make sure that the job_id column should be primary key and job_title should not be empty.</p> <table border="1"> <thead> <tr> <th>FIELD NAME</th> <th>DATA TYPE</th> <th>REMARKS</th> </tr> </thead> <tbody> <tr> <td>JOB_ID</td> <td>VARCHAR(10)</td> <td>PRIMARY KEY</td> </tr> <tr> <td>JOB_TITLE</td> <td>VARCHAR(35)</td> <td>NOT EMPTY</td> </tr> <tr> <td>MIN_SAL</td> <td>INTEGER</td> <td></td> </tr> <tr> <td>MAX_SAL</td> <td>INTEGER</td> <td></td> </tr> <tr> <td>BONUS</td> <td>INTEGER</td> <td></td> </tr> </tbody> </table>	FIELD NAME	DATA TYPE	REMARKS	JOB_ID	VARCHAR(10)	PRIMARY KEY	JOB_TITLE	VARCHAR(35)	NOT EMPTY	MIN_SAL	INTEGER		MAX_SAL	INTEGER		BONUS	INTEGER		
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Ans	<pre>CREATE DATABASE COMPANY; USE COMPANY; CREATE TABLE JOB (JOB_ID varchar(10) PRIMARY KEY, JOB_TITLE varchar(35) NOT NULL, MIN_SAL int , MAX_SAL int, BONUS int);</pre>																			
11	Which SQL command is used to display existing databases.	1																		
Ans	SHOW DATABASES;																			
12	An organisation named PRIDE wants to put all the data in the form of records. The records are stored in a table and tables are stored in a database. Which DDL command is used to create a database name PRIDE.	1																		
Ans	CREATE DATABASE PRIDE;																			
13	How to use an existing database name PRIDE ? Give an example.	1																		
Ans	USE PRIDE;																			
14	What is the difference between CHAR and VARCHAR in SQL? 1	1																		
Ans	VARCHAR is variable length, while CHAR is fixed length																			
15	How to delete the whole database named Student_Data?	1																		
Ans	DROP DATABASE Student_Data;																			
16	How to see the existing table structure in the database?	1																		
Ans	DESCRIBE table_name; OR DESC table_name;																			
17	What is the maximum value that can be stored in NUMERIC(6,2) ?	1																		
Ans	9999.99																			
18	What should be the data type for the column <i>Rate</i> storing values less than Rs. 1000, e.g., 400.40 ?	1																		
Ans	NUMBER(5,2)																			
19	What should be the data type for the column <i>IFSC_Code</i> storing alphanumeric bank code having 11 characters, e.g. SBIN0066200 ?	1																		
Ans	CHAR(11)																			
20	What should be the data type for the column <i>PINCode</i> storing 6-digit numeric PIN code for any address in India, e.g. 324100 ? Also, it should be calculation-proof.	1																		
Ans	NUMBER(6)																			

21	What should be the data type for the column <i>DOB</i> , e.g., 30/06/2002 What format does the SQL follow to store the <i>DOB</i> ?	1																																				
Ans	DATE 'YYYY-MM-DD'																																					
22	What do you understand by Degree and Cardinality of a table ? Give a suitable example.	2																																				
Ans	<p>Degree - Number of columns or attributes or fields in a table are called table's degree. Cardinality - Number of rows/tuples/records in a table are called table's cardinality. Example:</p> <p style="text-align: center;">TABLE - EMPLOYEE</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>ID</th> <th>Name</th> <th>DEPT</th> <th>EXPERIENCE</th> </tr> </thead> <tbody> <tr> <td>101</td> <td>Siddharath</td> <td>Sales</td> <td>12</td> </tr> <tr> <td>104</td> <td>Raghav</td> <td>Finance</td> <td>6</td> </tr> <tr> <td>107</td> <td>Naman</td> <td>Research</td> <td>10</td> </tr> <tr> <td>114</td> <td>Nupur</td> <td>Sales</td> <td>3</td> </tr> </tbody> </table> <p>Its degree is 4 (4 columns) and cardinality is 4 (4 rows)</p>	ID	Name	DEPT	EXPERIENCE	101	Siddharath	Sales	12	104	Raghav	Finance	6	107	Naman	Research	10	114	Nupur	Sales	3																	
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23	Give a suitable example of a table with sample data and illustrate Primary ,Candidate and Alternate Keys in it. (any two keys)	2																																				
Ans	<p>Primary Key. It is the set of one or more attributes that can uniquely identify tuples within a relation. Candidate Key. A candidate key is the one that is capable of becoming the primary key. Alternate Key. It is a candidate key which is not the primary key. Example :</p> <p style="text-align: center;">TABLE - EMPLOYEE</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>ID</th> <th>Name</th> <th>DEPT</th> <th>EXPERIENCE</th> <th>PANNO</th> </tr> </thead> <tbody> <tr> <td>101</td> <td>Siddharath</td> <td>Sales</td> <td>12</td> <td>SF63564</td> </tr> <tr> <td>104</td> <td>Raghav</td> <td>Finance</td> <td>6</td> <td>DGH645</td> </tr> <tr> <td>107</td> <td>Naman</td> <td>Research</td> <td>10</td> <td>HHD563</td> </tr> <tr> <td>114</td> <td>Nupur</td> <td>Sales</td> <td>3</td> <td>5634YH</td> </tr> </tbody> </table> <p>Candidate keys : ID,PANNO Primary Key : ID Alternate Key : PANNO</p>	ID	Name	DEPT	EXPERIENCE	PANNO	101	Siddharath	Sales	12	SF63564	104	Raghav	Finance	6	DGH645	107	Naman	Research	10	HHD563	114	Nupur	Sales	3	5634YH												
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24	Consider the following tables <i>GAME</i> and <i>PLAYER</i> and answer the parts(i) and (ii) accordingly. Table : <i>GAMES</i>	2																																				
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4	Ravi Jindal	105									
	<p>(i) Identify the candidate key(s) from the table GAMES .</p> <p>(ii) Which field will be considered as the foreign key if the tables GAMES and PLAYER are related in a database?</p>										
Ans	<p>(i) Candidate Key: GCODE , GAMENAME</p> <p>(ii) GCODE is the Foreign Key in PLAYER table and it is related to Primary Key GCODE of GAMES table.</p>										
<p>TOPIC: Alter table (add and remove an attribute, add and remove primary key), drop table, insert, delete, select, operators (mathematical, relational and logical), aliasing, distinct clause, where clause, in, between, order by, meaning of null, is null, is not null, like, update command, delete command</p>											
1	Which command of SQL is used to change/modify the structure of a table?	1									
Ans	ALTER TABLE										
2	Ms. Shruti has created a table GAMES having attributes ID, GAME, NO_OF_PLAYERS . Later she wants to add a new attribute DURATION of integer type in this table. How can she do this? Write down a full command.	1									
Ans	ALTER TABLE Games ADD Duration int(3);										
3	A table TEACHER has attributes CODE, NAME, POST, CATEGORY . Write down command to delete the attribute CATEGORY from this table.	1									
Ans	ALTER TABLE Teacher DROP Category;										
4	A table TEACHER has no primary key. Which command will be used to make one if its attribute named CODE its primary key?	1									
Ans	ALTER TABLE TEACHER ADD PRIMARY KEY(CODE);										
5	What will happen if following command is executed : - ALTER TABLE EMPLOYEE DROP PRIMARY KEY;	1									
Ans	After executing the above command the primary key of the EMPLOYEE table will be removed from the primary key and there will be no primary key in this table.										
6	What is the purpose of IS NULL and IS NOT NULL operators?	1									
Ans	<p>IS NULL and IS NOT NULL operators are used for filtering tuples from the table having or not having NULL values in a specific attribute. E.g.</p> <p>SELECT * FROM STUDENT WHERE DOB IS NULL;</p> <p>SELECT * FROM STUDENT WHERE CLASS IS NOT NULL;</p>										
7	What is the use of LIKE operator in SQL?	1									
Ans	<p>Like operator is used for matching patterns of character values on specific attributes and filter out the tuples on the basis of the given patterns. It uses two wildcard characters % and _ (Underscore) for specifying patterns.</p>										
8	Write the output of the queries (a) to (d) based on the table PLAYER given below:										

		PLAYER																																			
		PID	PNAME	GENDER	GAME	RANK																															
		P01	JASPRIT	M	CRICKET	5																															
		P02	SAYNA	F	BADMINTON	9																															
		P03	SANIYA	F	TENNIS	15																															
		P04	VIRAT	M	CRICKET	1																															
		P05	LAKSHYA	M	BADMINTON	51																															
		a. SELECT PNAME, GAME FROM PLAYER WHERE GENDER="F"; b. SELECT DISTINCT GAME FROM PLAYER; c. SELECT PID,PNAME,RANK FROM PLAYER WHERE GAME="CRICKET" ORDER BY RANK; d. SELECT * FROM PLAYER WHERE GENDER<>"M" AND RANK<10;																																			
Ans	a.	<table border="1"> <thead> <tr> <th>PNAME</th> <th>GAME</th> </tr> </thead> <tbody> <tr> <td>SAYNA</td> <td>BADMINTON</td> </tr> <tr> <td>SANIYA</td> <td>TENNIS</td> </tr> </tbody> </table>	PNAME	GAME	SAYNA	BADMINTON	SANIYA	TENNIS	C.		<table border="1"> <thead> <tr> <th>PI</th> <th>PNAME</th> <th>RANK</th> </tr> </thead> <tbody> <tr> <td>P04</td> <td>VIRAT</td> <td>1</td> </tr> <tr> <td>P01</td> <td>JASPRIT</td> <td>5</td> </tr> </tbody> </table>	PI	PNAME	RANK	P04	VIRAT	1	P01	JASPRIT	5																	
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9	Write the queries (a) to (d) based on the table BOOK given below:					4																															
		BOOK <table border="1"> <thead> <tr> <th>BNO</th> <th>TITLE</th> <th>AUTHOR</th> <th>DATE_PURCHASED</th> <th>PRICE</th> </tr> </thead> <tbody> <tr> <td>P01</td> <td>IP CLASS XI</td> <td>A ARORA</td> <td>2020-01-05</td> <td>350</td> </tr> <tr> <td>P02</td> <td>COMP SCI</td> <td>P ARORA</td> <td>2020-10-15</td> <td>250</td> </tr> <tr> <td>P03</td> <td>CS CLASS XII</td> <td>NCERT</td> <td>2021-06-30</td> <td>NULL</td> </tr> <tr> <td>P04</td> <td>ACCOUNTANCY</td> <td>CBSE</td> <td>2022-01-01</td> <td>550</td> </tr> <tr> <td>P05</td> <td>IP With PYTHON</td> <td>NCERT</td> <td>2021-12-01</td> <td>400</td> </tr> </tbody> </table>					BNO	TITLE	AUTHOR	DATE_PURCHASED	PRICE	P01	IP CLASS XI	A ARORA	2020-01-05	350	P02	COMP SCI	P ARORA	2020-10-15	250	P03	CS CLASS XII	NCERT	2021-06-30	NULL	P04	ACCOUNTANCY	CBSE	2022-01-01	550	P05	IP With PYTHON	NCERT	2021-12-01	400	
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P05	IP With PYTHON	NCERT	2021-12-01	400																																	
		a. Display details of the books whose price not mentioned b. Display title and date of purchase of the books having "IP" in their title. c. Display all the details of books by NCERT in the descending order of their price. d. Add Rs. 50 in the price of all the books by CBSE.																																			
Ans	a. SELECT * FROM BOOK WHERE PRICE IS NULL; b. SELECT TITLE,DATE_PURCHASED FROM BOOK WHERE TITLE LIKE "%IP%"; c. SELECT * FROM BOOK WHERE AUTHOR="NCERT" ORDER BY PRICE DESC d. UPDATE BOOK SET PRICE=PRICE+50 WHERE AUTHOR ="CBSE";																																				
10	Write the queries (a) to (d) based on the table BOOK given below:					4																															

		BOOK									
		BNO	TITLE	AUTHOR	DATE_PURCHASED	PRICE					
		P01	IP CLASS XI	A ARORA	2020-01-05	350					
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		P03	CS CLASS XII	NCERT	2021-06-30	NULL					
		P04	ACCOUNTANCY	CBSE	2022-01-01	550					
		P05	IP With PYTHON	NCERT	2021-12-01	400					
		<p>a. Display details of the books which have been purchased before 01-01-2022</p> <p>b. Display BNO, TITLE and PRICE of books which book no is P01, P03 or P05.</p> <p>c. Delete all the books whose price is not given.</p> <p>d. Increase the price of all the books by 10% whose price is below 300.</p>									
Ans		<p>a. SELECT * FROM BOOK WHERE DATE_PURCHASED<'2022-01-01';</p> <p>b. SELECT BNO,TITLE, PRICE FROM BOOK WHERE TITLE IN ("P01","P02","P03");</p> <p>c. DELETE FROM BOOKS WHERE PRICE IS NULL;</p> <p>d. UPDATE BOOK SET PRICE=PRICE+PRICE*.10 WHERE PRICE<300;</p>									
11		What is the difference between where clause and having clause?					2				
Ans		WHERE CLAUSE		HAVING CLAUSE							
		It is used to apply conditions on individual rows.		It is used to apply conditions on a group of rows.							
		Example: Select * from customer where salary>2000; Example:		Select city,sum(salary) from customer group by city having city="Jaipur";							
12		What is equi join?Explain with suitable example.					2				
Ans		<p>It joins two tables on equality of values in matching column (s) of the specified tables.</p> <p>CUSTOMER(ID,NAME,CITY)</p> <p>ORDER(ORDERID,ID,AMOUNT)</p> <p>Select * from CUSTOMER,ORDER where CUSTOMER.ID=ORDER.ID;</p>									
TOPIC: Aggregate functions (max, min, avg, sum, count), group by, having clause, joins : Cartesian product onto two tables, equi-join and natural join											
1		What are the different categories of functions in SQL?					1				
Ans		<p>Types of functions in SQL</p> <p>Single Row Functions - LEN(), UPPER(), LOWER() ETC.</p> <p>Aggregate Functions - SUM(), MAX() ETC</p>									
2		What do you understand by Aggregate functions in SQL?					1				
Ans		<p>An aggregate function in SQL performs a calculation on multiple values and returns a single value. SQL provides following aggregate functions: -</p> <p>Sum(), Avg(), Count(), Max(), MIN()</p>									
3		<p>A table CLIENT has an attribute AGE. What will be the output of the following query based on the data of AGE column given below: - SELECT COUNT(AGE) FROM CLIENT;</p> <p>TABLE - CLIENT</p> <table border="1"> <tr><td>AGE</td></tr> <tr><td>40</td></tr> <tr><td>NULL</td></tr> <tr><td>50</td></tr> </table>					AGE	40	NULL	50	1
AGE											
40											
NULL											
50											

	30																																									
Ans	COUNT(AGE) 3																																									
4	Consider table given in Question 6 and write down the output of the following query: - SELECT AVG(AGE) FROM CLIENT;	1																																								
Ans	AVG(AGE) 40																																									
5	What is join? What are different types of joins in SQL?	2																																								
Ans	join is used to combine rows from two or more tables, based on a related column between them. Type of Joins: -Cross Join/Cartesian Product , Equi Join ,Natural Join																																									
6	Consider following table and write query for question (i) to (iv): - <p style="text-align: center;">ACCOUNT</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>ACNO</th> <th>C_NAME</th> <th>BALANCE</th> <th>TYPE</th> <th>BRANCH</th> </tr> </thead> <tbody> <tr> <td>111</td> <td>KAMLESH KJMAR</td> <td>50000</td> <td>SAVING</td> <td>JAIPUR</td> </tr> <tr> <td>112</td> <td>SANDEEP JAIN</td> <td>25000</td> <td>SAVING</td> <td>UDAIPUR</td> </tr> <tr> <td>113</td> <td>RAJESH SHARMA</td> <td>30000</td> <td>CURRENT</td> <td>AJMER</td> </tr> <tr> <td>114</td> <td>OMESH</td> <td>20000</td> <td>CURRENT</td> <td>JAIPUR</td> </tr> <tr> <td>115</td> <td>RITIK GUPTA</td> <td>70000</td> <td>SAVING</td> <td>KOTA</td> </tr> </tbody> </table> <p>(i) Display total balance of account table. (ii) Display average balance at JAIPUR branch. (iii) Display maximum balance and minimum balance of each branch. (iv) Display number of accounts of each type</p>	ACNO	C_NAME	BALANCE	TYPE	BRANCH	111	KAMLESH KJMAR	50000	SAVING	JAIPUR	112	SANDEEP JAIN	25000	SAVING	UDAIPUR	113	RAJESH SHARMA	30000	CURRENT	AJMER	114	OMESH	20000	CURRENT	JAIPUR	115	RITIK GUPTA	70000	SAVING	KOTA	4										
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Ans	i) SELECT SUM(BALANCE) FROM ACCOUNT; ii) SELECT AVG(BALANCE) FROM ACCOUNT WHERE BRANCH="JAIPUR"; iii) SELECT BRANCH, MAX(BALANCE), MIN(BALANCE) FROM ACCOUNT GROUP BY BRANCH; iv) SELECT TYPE,COUNT(*) FROM ACCOUNT GROUP BY TYPE;																																									
7	Consider following table and write query for question (i) to (iv): - <p style="text-align: center;">CONTACTS</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>ID</th> <th>NAME</th> <th>CITY</th> <th>STATE</th> <th>MOBILE</th> </tr> </thead> <tbody> <tr> <td>111</td> <td>KAMLESH KUMAR</td> <td>MUMBAI</td> <td>MAHARASHTRA</td> <td>9858499341</td> </tr> <tr> <td>112</td> <td>SANDEEP JAIN</td> <td>CHENNAI</td> <td>TAMILNADU</td> <td>9857683422</td> </tr> <tr> <td>113</td> <td>RAJESH SHARMA</td> <td>KOLKATA</td> <td>WEST BENGAL</td> <td>9862345563</td> </tr> <tr> <td>114</td> <td>OMESH</td> <td>CHENNAI</td> <td>TAMILNADU</td> <td>7658364654</td> </tr> <tr> <td>115</td> <td>RITIK GUPTA</td> <td>MUMBAI</td> <td>MAHARASHTRA</td> <td>8734645335</td> </tr> <tr> <td>116</td> <td>GAGNESH</td> <td>CHENNAI</td> <td>TAMILNADU</td> <td>9244535446</td> </tr> <tr> <td>117</td> <td>HARVINDER</td> <td>CHANDIGARH</td> <td>PUNJAB</td> <td>7885500307</td> </tr> </tbody> </table> <p>A. Display total no. of contacts from TAMILNADU state. B. Display number of contacts from each city. C. Display details of contacts whose city is either starting from M or K D. Display name of state and total number of contacts where at least 2 contacts are there.</p>	ID	NAME	CITY	STATE	MOBILE	111	KAMLESH KUMAR	MUMBAI	MAHARASHTRA	9858499341	112	SANDEEP JAIN	CHENNAI	TAMILNADU	9857683422	113	RAJESH SHARMA	KOLKATA	WEST BENGAL	9862345563	114	OMESH	CHENNAI	TAMILNADU	7658364654	115	RITIK GUPTA	MUMBAI	MAHARASHTRA	8734645335	116	GAGNESH	CHENNAI	TAMILNADU	9244535446	117	HARVINDER	CHANDIGARH	PUNJAB	7885500307	4
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Ans	A. SELECT COUNT(*) FROM CONTACTS WHERE STATE="TAMILNADU"; B. SELECT CITY COUNT(*) FROM CONTACTS GROUP BY CITY; C. SELECT * FROM CONTACTS WHERE CITY LIKE "M%" or CITY LIKE "K%"; D. SELECT STATE,COUNT(*) FROM CONTACTS GROUP BY STATE HAVING COUNT(*)>2;																																	
8	<p>Answer the following questions based on table CUSTOMER and ORDER.</p> <p style="text-align: center;">CUSTOMER:</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>ID</th> <th>NAME</th> <th>AGE</th> <th>ADDRESS</th> <th>SALARY</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>RAMESH</td> <td>32</td> <td>DELHI</td> <td>2000</td> </tr> <tr> <td>2</td> <td>SURESH</td> <td>25</td> <td>KOTA</td> <td>1500</td> </tr> <tr> <td>3</td> <td>HARDIK</td> <td>27</td> <td>BHOPAL</td> <td>6500</td> </tr> </tbody> </table> <p style="text-align: center;">ORDER:</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>ORDER_ID</th> <th>ORDER_DATE</th> <th>CUSTOMER_ID</th> <th>AMOUNT</th> </tr> </thead> <tbody> <tr> <td>101</td> <td>12/11/1990</td> <td>2</td> <td>100</td> </tr> <tr> <td>102</td> <td>1/2/2000</td> <td>3</td> <td>200</td> </tr> </tbody> </table> <p>A. Identify foreign key in above tables with suitable explanation. B. What will be the degree and cardinality of the resultant table after the cartesian product of the table customer and order . C. What will be the cardinality of table customer after removal of column salary.</p>	ID	NAME	AGE	ADDRESS	SALARY	1	RAMESH	32	DELHI	2000	2	SURESH	25	KOTA	1500	3	HARDIK	27	BHOPAL	6500	ORDER_ID	ORDER_DATE	CUSTOMER_ID	AMOUNT	101	12/11/1990	2	100	102	1/2/2000	3	200	3
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ORDER_ID	ORDER_DATE	CUSTOMER_ID	AMOUNT																															
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102	1/2/2000	3	200																															
Ans	A. CUSTOMER:NO FOREIGN KEY , ORDER:CUSTOMER_ID Explanation: (i)values of column CUSTOMER_ID are from the domain of primary key ID from CUSTOMER table. , (ii)Its a non-key attribute. B. Degree=9 , Cardinality=6 C. Cardinality=3																																	
TOPIC:Interface of python with an SQL database: connecting SQL with Python, performing insert, update, delete queries using cursor, display data by using fetchone(), fetchall(), rowcount, creating database connectivity applications																																		
1	What is the Database Connector?	1																																
Ans	A database connector is a software that connects an application to any database.																																	
2	Write the command to install the mysql-connectors module for python.	1																																
Ans	pip install mysql-connector																																	
3	Which function is used to check the successful connection?	1																																
Ans	is_connected() method																																	
4	Write python code to connect with the database named "XIICS".	2																																
Ans	import mysql.connector myconn = mysql.connector.connect (host='localhost', user='root', password='root', database='XIICS') myconn.close()																																	
5	What is a cursor? Explain how to initiate the same.	2																																
Ans	A cursor is an object which helps to execute the query and fetch the records from the database. import mysql.connector myconn = mysql.connector.connect (host='localhost', user='root', password='root', database='XIICS')																																	

	<code>mycursor = myconn.cursor() mycursor.execute("MySQL Command") myconn.close()</code>	
6	What are the multiple ways to retrieve data?	2
Ans	Data can be fetched from MYSQL using the <code>fetch()</code> method provided by the <code>mysqlconnector-python</code> . The cursor provides three methods namely <code>fetchall()</code> , <code>fetchmany()</code> and <code>fetchone()</code> . <ul style="list-style-type: none"> • The <code>fetchone()</code> method fetches the next row in the result of a query and returns it as a tuple. • The <code>fetchall()</code> method retrieves all the rows in the result set of a query and returns them as a list of tuples. (If we execute this after retrieving a few rows it returns the remaining ones). • The <code>fetchmany()</code> method is similar to the <code>fetchone()</code> but it retrieves the next set of rows in the result set of a query, instead of a single row. 	
7	Which method is used to insert multiple records into a table?	1
Ans	<code>executemany()</code> method	
8	What is the result set?	1
Ans	A <code>ResultSet</code> is a table of data returned by the <code>.execute()</code> method, containing a list of tuples of query results, which is usually generated by executing a statement that queries the database. The object of <code>ResultSet</code> maintains a cursor pointing to a row of a table.	
9	Write a python database connectivity script to create a Database named "XIICS" and a Table named "Student".	2
Ans	<pre>import mysql.connector try: myconn = mysql.connector.connect (host='localhost', user='root', password='root') mycursor = myconn.cursor() mycursor.execute('CREATE DATABASE IF NOT EXISTS XIICS') mycursor.execute('USE XIICS') mycursor.execute(""" CREATE TABLE IF NOT EXISTS Student (rollNo INT PRIMARY KEY, firstName VARCHAR(15) NOT NULL, lastName VARCHAR(15) NOT NULL, class INT NOT NULL, city VARCHAR(20)); """) myconn.close() print("Database and Table created successfully") except: print("Error! Unable to create database and table. Please try again later.")</pre>	
10	Write python commands to display data by using <code>fetchone()</code> and <code>fetchall()</code>	
Ans	<pre>#fetchone() import mysql.connector myconn = mysql.connector.connect (host='localhost',user='root', password='root', database='XIICS') rollNo = 101 mycursor = myconn.cursor() mycursor.execute('SELECT rollNo, firstName, lastName FROM Student WHERE rollNo = %s', (rollNo,)) record = list(mycursor.fetchone()) print(str(record[0]) + " " + str(record[1]) + " " + str(record[2]))</pre>	

	<pre> myconn.close() #fetchall() import mysql.connector myconn = mysql.connector.connect (host='localhost',user='root', password='root', database='XIICS') rollNo = 101 mycursor = myconn.cursor() mycursor.execute('SELECT rollNo, firstName, lastName FROM Student WHERE rollNo = %s', (rollNo,)) records = list(mycursor.fetchall()) for record in records: print(str(record[0]) + " " + str(record[1]) + " " + str(record[2])) myconn.close() </pre>	
11	Write a python database connectivity script to insert a student record in the “Student” table. Data should be read from the user at run time.	2
Ans	<pre> import mysql.connector stuList = [] stuList.append(input('Enter Student Roll No.: ')) stuList.append(input('Enter First Name: ')) stuList.append(input('Enter Last Name: ')) stuList.append(input('Enter Class: ')) stuList.append(input('Enter City: ')) try: myconn = mysql.connector.connect (host='localhost',user='root', password='root', database='XIICS') mycursor = myconn.cursor() mycursor.execute('INSERT INTO Student (rollNo, firstName, lastName, class, city) VALUES (%s, %s, %s, %s, %s)', stuList) myconn.commit() myconn.close() print("Student with student roll no. "+stuList[0]+" added successfully") except Exception: print("Error! Unable to add the student. Please try again") </pre>	
12	Write a python database connectivity script to update the first name of the student having roll no. as 101 in the “Student” table.	2
Ans	<pre> import mysql.connector myconn = mysql.connector.connect (host='localhost',user='root', password='root', database='XIICS') rollNo = 101 mycursor = myconn.cursor() mycursor.execute('UPDATE Student SET firstName = "Bhagat" WHERE rollNo = %s', (rollNo,)) print("No. of rows affected:", mycursor.rowcount) myconn.commit() myconn.close() </pre>	
13	Write a python database connectivity script that deletes records from “Student” table having second character of Surname as “u”	2
Ans	<pre> import mysql.connector myconn = mysql.connector.connect (host='localhost',user='root', password='root', </pre>	

	<pre> database='XIICS') mycursor = myconn.cursor() mycursor.execute('DELETE FROM Student WHERE Surname LIKE %s', ("_u%,)) myconn.commit() myconn.close() </pre>	
14	<p>A resultset is extracted from the database using a cursor object by giving the following statement:</p> <pre>data = cursor.fetchmany(5)</pre> <p>a. How many records will be returned by the fetchmany() function/method? b. What is the datatype of 'data' after the execution of the above statement?</p>	2
Ans	<p>a. Five records (Please note that the fetchmany() function fetches all the records if the number of records fetched from the database are less than the number of records specified by the argument of fetchmany() function). b. List</p>	
15	<p>A resultset is extracted from the database using a cursor object by giving the following statement:</p> <pre>data = cursor.fetchmany(5)</pre> <p>a. How many records will be returned by the fetchmany() function/method if 10 records were returned from the database? b. What is the datatype of 'data' after the execution of the above statement?</p>	2
Ans	<p>a. 5 records b. List containing 5 tuples</p>	

PHYSICAL EDUCATION

TERM-2

CLASS 12

SESSION 2021-22

Shorts Answer Questions-

- 1- What is obesity? How can we know if we are obese?
- 2- Explain Bhujangasana and its procedure.
- 3- Discuss the procedure of Gomukhasana.
- 4- Explain Pawanmuktasana.
- 5- What is the role of Sukhasana in modern life?
- 6- Explain the types of disabilities.
- 7- Explain Sensory Processing Disorder.
- 8- Discuss the causes of ODD.
- 9- Discuss the role of genetics in ADHD.
- 10- Define in brief a disorder and its symptoms.
- 11- Write a short note on vital capacity.
- 12- Elaborate the effect of aging on bone density.
- 13- Discuss any three physiological factors determining flexibility.
- 14- What changes take place in cardiovascular system by doing regular exercise?
- 15- Explain the management of fracture?
- 16- Classify sports injuries with their causes.
- 17- What is laceration and how do you treat it?
- 18- What is greenstick fracture? How do you manage it?
- 19- What measures are taken for first aid on the sports field?
- 20- What is the big five theory? Explain in brief.
- 21- What are the dimensions of personality?
- 22- What is emotional stability?
- 23- How does regular exercise improve mood?
- 24- What are the typical characteristics of introvert?
- 25- Discuss the types of strength.
- 26- State any one method to develop speed.
- 27- Explain short-term and long-term endurance.
- 28- What is circuit training? Mention its advantages.
- 29- Discuss the dynamic flexibility. How can develop flexibility.
- 30- What is isometric exercise and what is its focus?

Long Answer Questions-

- 1- What is lifestyle disease? How can we prevent them?
- 2- What do you mean by asthma? Explain the procedure, benefits and contradictions of Chakrasana.
- 3- What is hypertension? Discuss the benefits and contradictions of Vajrasana and ArdhaChakrasana.
- 4- Discuss the health benefits of yoga for obesity and explain any one asana in detail.
- 5- Back pain is an impediment. Explain how yoga can help and describe any one asana in detail to get rid of backache.
- 6- How can we make physical activities accessible to special need children?
- 7- What is obsessive compulsive disorder? Explain its causes in detail.
- 8- Discuss in detail the causes of disabilities and their prevention.
- 9- What is the advantage of physical activities for special needs children?
- 10- Disability etiquette is necessary in modern world. Explain.
- 11- What is the effect of regular exercise on the respiratory system?
- 12- Elucidate any five physiological changes due to aging/

- 13- Enumerate any five effects of exercise on muscular system.
- 14- Define sports injuries. Classify and write about prevention of sports injuries.
- 15- Define and discuss the management of transverse, oblique and impacted fracture.
- 16- What are joint injuries? Discuss the measures we can take to prevent them.
- 17- What is the RICE concept in sports medicine?
- 18- Explain the term "stress". How can it be managed?
- 19- Define personality. Explain its type in detail.
- 20- Explain the structure of personality. Describe the role of sports in developing personality.
- 21- Define motivation. Elucidate any five techniques of motivation.
- 22- How many types of aggression in sports exist? Describe any one of them.
- 23- Describe the personality division by Carl Jung and briefly explain any two.
- 24- Define endurance and discuss any two methods to increase endurance.
- 25- Discuss coordinative abilities in detail.
- 26- Describe pace races. Why they are important?
- 27- How can improve coordinative abilities?
- 28- What is fartlek training and what are its disadvantages?
- 29- What is explosive strength? In what sports is it important and why?
- 30- How is muscles strength measured? Explain in detail with specific mention of its units.

TERM II
SAMPLE QUESTION PAPER (2021-22)
ENGLISH – CORE
CLASS-XII

Time allowed: 2 Hrs.

Maximum Marks: 40

General Instructions:

1. The Question Paper contains THREE sections-READING, WRITING and LITERATURE.
2. Attempt questions based on specific instructions for each part.

SECTION A – READING (14 marks)		Marks
1.	<p>Read the passage given below.</p> <p>I saw ‘<i>Jaws</i>’, the popular shark movie, the summer it came out, in 1975 and became paranoid about sharks. Though I kept swimming after <i>Jaws</i>, it was always with the vague fear that a shark’s teeth could tug on my leg at any moment. Never mind that there’d been only two shark bites since 1900 on the Connecticut coast, where I lived.</p> <p>5</p> <p>So, when I got this assignment for the <i>National Geographic</i> magazine, I decided to accept and do what I’d never wanted to do: swim with the sharks. I had to go to a place in the Bahamas known as Tiger Beach and dive with tiger sharks, the species responsible for more recorded attacks on humans than any shark except the great white. It was to be my first dive after getting certified—which meant it would be my first dive anywhere other than a swimming pool or a quarry—and without a diver’s cage. Most people who got wind of this plan thought I was either very brave or very stupid.</p> <p>10</p> <p>But I just wanted to puncture an illusion. The people who know sharks intimately tend to be the least afraid of them, and no one gets closer to sharks than divers. The divers who run operations at Tiger Beach speak lovingly of the tiger sharks the way people talk about their children or their pets. In their eyes, these sharks aren’t man-eaters any more than dogs are.</p> <p>15</p> <p>The business of puncturing illusions is never just black and white. My fellow divers had hundreds of dives under their belt and on the two-hour boat ride to the site in the morning of our first dive, they kept saying things like, “Seriously, I really can’t believe this is your first dive.” All this was okay with me until I reached the bottom and immediately had to fend off the first tiger shark, I had ever laid eyes on. However, when I watched the other divers feeding them fish and steering them gently, it became easy to see the sharks in a very benign light.</p> <p>20</p> <p>I think it would be unfair not to mention that though tiger sharks are apex predators. They act as a crucial balancing force in ocean ecosystems, constraining the numbers of animals like sea turtles and limit</p> <p>25</p> <p>30</p>	

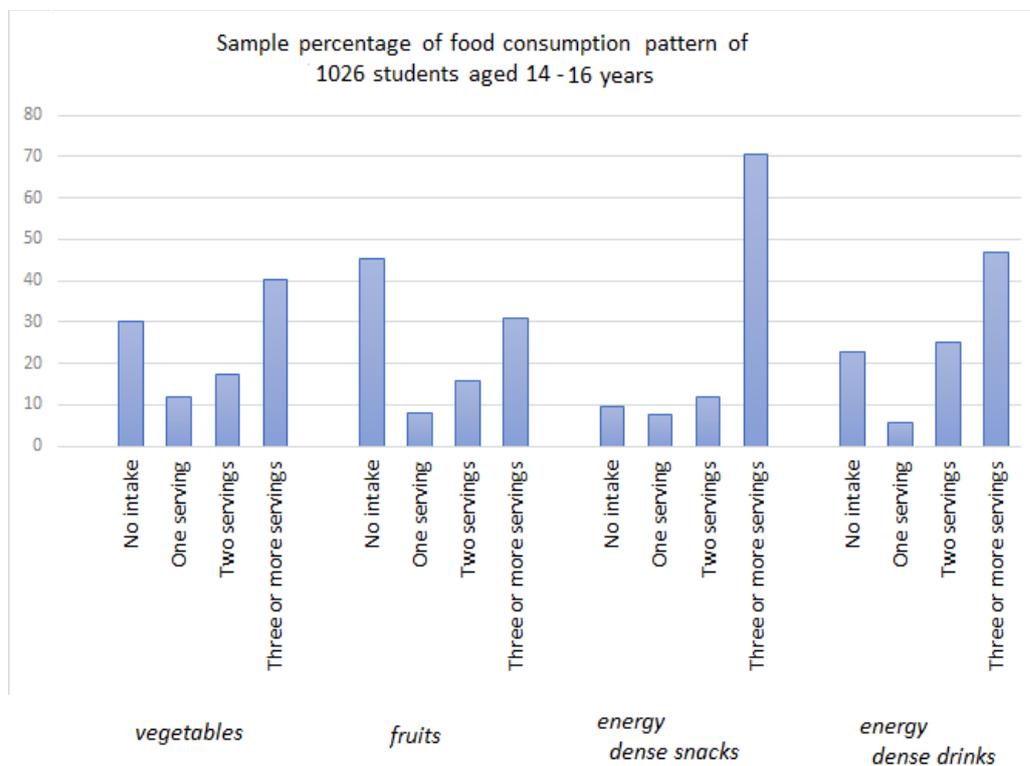
	<p>their behaviour by preventing them from overgrazing the sea grass beds. Furthermore, tiger sharks love warm water, they eat almost anything, have a huge litter and are the hardiest shark species. If the planet and its oceans continue to warm, some species will be winners and others will be losers, and tiger sharks are likely to be winners.</p> <p>Based on your understanding of the passage, answer <u>ANY EIGHT</u> questions from the nine given below.</p>	1*8
i.	Cite a point in evidence, from the text, to suggest that the writer's post- <i>Jaws</i> fear was not justified.	1
ii.	State any one trait of the writer that is evident from lines 5-10 and provide a reason for your choice.	1
iii.	People thought the writer was 'either brave or very stupid'. Why did some people think that he was 'very stupid'?	1
iv.	Why does the writer say that people who know sharks intimately tend to be least afraid of them?	1
v.	Rewrite the given sentence by replacing the underlined phrase with another one, from lines 10 – 20. <i>Some academicians think that reward, as a form of discipline, is a simple <u>right or wrong</u> issue.</i>	1
vi.	What does the use of the phrase 'benign light' suggest in the context of the writer's viewpoint about the tiger sharks?	1
vii.	Select a suitable phrase from lines 15-25 to complete the following sentence appropriately. <i>I agree the team will find this experience tough, but competing will be easier next time after they get this tournament _____.</i>	1
viii.	Apex predators serve to keep prey numbers in check. How can we say that tiger sharks are apex predators?	1
ix.	Analyse why having a large litter is one of the features that empowers tiger sharks to emerge winners if global warming persists.	1
2.	<p>Read the passage given below.</p> <p>Changing food preferences have brought about rapid changes in the structure of the Indian diet. The rapid proliferation of multinational fast-food companies and the influence of Western culture have replaced traditional home-cooked meals with ready-to-eat, processed foods thus increasing the risk of chronic diseases in urban Indians. Therefore, nurturing</p>	6

healthy eating habits among Indians from an early age would help to reduce health risks.

To date, little is known about the quality and quantity of foods and beverages consumed by urban Indian adolescents. This lack of evidence is a significant barrier to the development of effective nutrition promotion and disease prevention measures.

Therefore, a self-administered, semi-quantitative, 59-item meal-based food frequency questionnaire (FFQ) was developed to assess the dietary intake of adolescents. A total of 1026 students (aged 14–16 years) attending private, English-speaking schools in Kolkata completed the survey.

A sample percentage of the food consumption pattern is displayed (Fig. 1)



The survey results report poor food consumption patterns and highlights the need to design healthy eating initiatives. Interestingly, while there were no gender differences in the consumption of legumes and fried snacks, the survey found more females consumed cereals, vegetables and fruits than their male counterparts.

In conclusion, the report suggested that schools ought to incorporate food literacy concepts into their curriculum as they have the potential of increasing the fruit and vegetable intake in teenagers. Additionally, healthy school canteen policies with improved availability, accessibility, variety and affordability of healthy food choices would support the consumption of nutritious food in students.

	<p>Adapted from: https://nutritionj.biomedcentral.com/articles/10.1186/s12937-017-0272-3</p> <p>Based on your understanding of the passage, answer <u>ANY SIX</u> out of the seven questions given below.</p> <p>i. What does the researcher mean by ‘changing food preferences’? 1</p> <p>ii. Why was this survey on the food consumption of adolescents undertaken? 1</p> <p>iii. With reference to fig.1, write one conclusion about students' consumption of energy-dense drinks. 1</p> <p style="text-align: center;">FOR THE VISUALLY IMPAIRED CANDIDATES</p> <p>What do you understand by the term <i>food frequency</i>, as stated in lines 12-13?</p> <p>iv. What can be concluded by the ‘no intake’ data of fruit consumption versus energy dense snacks, with reference to fig.1? 1</p> <p style="text-align: center;">FOR THE VISUALLY IMPAIRED CANDIDATES</p> <p>Comment on the significance of incorporating food literacy concepts into student curriculum.</p> <p>v. There were no gender differences observed in the consumption of healthy foods, according to the survey. Substantiate. 1</p> <p>vi. Why is ‘affordability’ recommended as a significant feature of a school canteen policy? 1</p> <p>vii. Identify a word from lines 9 - 18 indicating that the questionnaire was specifically designed to be completed by a respondent without the intervention of the researcher collecting the data. 1</p>	<p>1*6</p>
	SECTION B – WRITING	8
3.	<p>You are Natasha, residing in Pune. Your cousin, from the same city is hosting your grandmother’s eightieth birth anniversary and has extended an invite to you. He has also requested your assistance for arrangements needed. Draft a reply of acceptance, in not more than 50 words.</p>	3
4. A.	<p>Attempt ANY ONE from A and B given below.</p> <p>You are Shantanu, residing at Ghar B-94, Balimela Road, Malkangiri. You come across the following classified advertisement in a local daily. Write a letter, in about 120-150 words, applying for the position of a volunteer for the <i>Each One Teach One</i> campaign.</p>	5

SITUATION VACANT

WANTED committed volunteers, aged 18 years and above, to teach underprivileged children, for one hour a week, in the district of Malkangiri. Ability to speak, read and write Odiya fluently, important. Experience not necessary. All volunteers to receive training. Contact Nethra N, Coordinator (*Each One Teach One*), *4Literacy*, Ambaguda, Malkangiri, Odisha -764045

OR

B. The efforts of 400 volunteers working with the NGO, *4Literacy*, in the district of Malkangiri, Odisha, was lauded by the District Collector, Shri V. Singh (IAS). As a staff reporter of 'The Odisha Bhaskar', write a report about this in 120-150 words covering all the details of the event, such as training, teaching and infrastructure involved in the '*Each One Teach One*' campaign, initiated by the district administration in association with the NGO.

SECTION C - LITERATURE

18

5.	Attempt ANY FIVE of the six questions given below, within 40 words each.	2x5=10
	i. A mistaken identity led to a discovery of a new one for the rattrap peddler. How did this impact him?	2
	ii. As the host of a talk show, introduce Rajkumar Shukla to the audience by stating any two of his defining qualities. You may begin your answer like this: <i>Meet Rajkumar Shukla, the man who played a pivotal role in the Champaran Movement. He</i>	2
	iii. Adrienne Rich chose to express her silent revolt through her poem, <i>Aunt Jennifer's Tigers</i> , just as Aunt Jennifer did with her embroidery. Explain.	2
	iv. Rationalize why Keats uses the metaphor 'an endless fountain of immortal drink' in his poem, <i>A Thing of Beauty</i> .	2
	v. How do you think Derry's mother contributes to his sense of alienation and isolation? (<i>On the Face of It</i>)	2
	vi. Validate John Updike's open-ended title, ' <i>Should Wizard Hit Mommy?</i> '.	2
6.	Answer ANY TWO of the following in about 120-150 words each.	4*2
i.	How does Keats' poem, <i>A Thing of Beauty</i> appeal richly to the senses, stimulating the reader's inner sight as well as the sense of touch and smell? Write your answer in about 120-150 words.	4

ii.	Colin Dexter, the author of <i>Evans Tries an O-level</i> employs the red herring technique of intentionally misleading readers by placing false clues to keep the plot enigmatic. Substantiate with reference to text, in about 120-150 words.	4
iii.	Biographies include features of non-fiction texts – factual information and different text structures such as description, sequence, comparison, cause and effect, or problem and solution. Examine <i>Indigo</i> in the light of this statement, in about 120-150 words.	4

TERM II-MARKING SCHEME (2021-22)
SAMPLE QUESTION PAPER (2021-22)
ENGLISH – CORE
CLASS-XII

SECTION A – READING (14 marks)

Note:

- (i) The Reading Section focuses on testing a candidate’s ability to comprehend.
- (ii) Marks should be awarded only if the answer reveals formation of a response to the question.
- (iii) **No marks to be awarded** if a chunk/exact line/s is/are transcribed from the passage without evidence of structure or semblance of coherent thought, in an attempt to pass off as a response.

1. Based on your understanding of the passage, answer **ANY EIGHT** questions from the nine given below.

i. Cite a point in evidence, from the text, to suggest that the writer's post Jaws fear was not justified. (1 mark)

Value Points	Guidance
Not justified as stated in the text that there were only 2 shark attacks reported in 75 years i.e., from 1900 – 1975, so it was highly unlikely that he had anything to fear.	<p>The learner is required to look for evidence in the passage supporting/proving that the writer’s fear of sharks (after the movie) was a bit irrational.</p> <ul style="list-style-type: none"> ▪ Award maximum 1 mark for the complete correct answer. ▪ There is no partial credit

ii. State any one trait of the writer that is evident from lines 5-10 and provide a reason for your choice. (1 mark)

Value Points	Guidance
<p>Adventurous/ Courageous/ Bold/ Experimental</p> <p>Because he feared the tiger sharks/ was aware of the fact that they were dangerous, yet accepted, as his very first assignment, that required him to face them.</p>	<p>The learner is required to infer the writer’s trait from lines 5-10. The reason/ evidence for the choice of trait is to be stated too.</p> <ul style="list-style-type: none"> ▪ Award maximum 1 mark for the trait and reason. ▪ Partial credit for either trait or reason ▪ No credit for just quoting from text without an impression of an answer.

iii. People thought the writer was ‘either brave or very stupid’. Why did some people think that he was ‘very stupid’? (1 mark)

Value Points	Guidance
because he was risking his life and could be bitten by the sharks as other people were/ side-lined the popular notion that tiger sharks are dangerous/ did not pay due attention to the fact that he was walking into obvious danger without the required expertise	The learner is required to answer to just the ‘very stupid’ part. The ‘brave’ part hasn’t been asked, and there is no credit for explanation of that.

	<ul style="list-style-type: none"> ▪ Accept any 1 point. ▪ Award 1 mark for the complete correct answer ▪ Accept a relevant complete response along the same lines. ▪ There is no partial credit
iv. Why does the writer say that people who know sharks intimately tend to be least afraid of them? (1 mark)	
Value Points	Guidance
because they find the sharks to be harmless/ as docile as pets—the sharks feed on the food they offer and seem as docile as pets	<p>The learner is required to answer to why familiarity with the sharks makes the people less/least afraid of them.</p> <ul style="list-style-type: none"> ▪ Award maximum 1 mark for the complete correct answer ▪ Award partial credit of ½ mark if just ‘harmless’/ ‘as docile as pets’ is the response, without substantiation.
v. Rewrite the given sentence by replacing the underlined phrase with another one, from lines 10 – 20. <i>Some academicians think that reward, as a form of discipline, is a simple <u>right or wrong</u> issue.</i> (1 mark)	
Value Points	Guidance
Some academicians think that reward, as a form of discipline, is a simple <u>black and white</u> issue.	<ul style="list-style-type: none"> ▪ Award 1 mark for the correct answer ▪ No partial credit <p>Learners are expected to write the full sentence with the answer, however, no marks to be deducted if they just write the phrase only.</p>
vi. What does the use of the phrase ‘benign light’ suggest in the context of the writer’s viewpoint about the tiger sharks? (1 mark)	
Value Points	Guidance
<ul style="list-style-type: none"> ▪ Benign light – viewed as benevolent/ gentle/ friendly ▪ Tiger sharks did not seem to be that harmful/dangerous/ They seemed fairly docile/less dangerous than the other sharks 	<ul style="list-style-type: none"> ▪ Award maximum 1 mark for the complete correct answer. ▪ Award partial credit of ½ mark if just the meaning of ‘benign light’ is explained, without the context of tiger sharks and vice versa. Accept any other similar interpretations that are complete, with reference to the given passage.
vii. Select a suitable phrase from lines 15-25 to complete the following sentence appropriately. (1 mark) <i>I agree the team will find this experience tough, but competing will be easier next time after they get this tournament _____.</i>	
Value Points	Guidance

<p>I agree the team will find this experience tough, but competing will be easier next time after they get this tournament <u>under their belt</u>. (line 21)</p>	<ul style="list-style-type: none"> ▪ Award 1 mark for the correct answer ▪ No partial credit <p>Learners are expected to write the full sentence with the answer filled in, however, no marks to be deducted if they just write the phrase only.</p>
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viii. Apex predators serve to keep prey numbers in check. How can we say that tiger sharks are apex predators? (1 mark)

Value Points	Guidance
<p>Because tiger sharks restrict the number of sea turtles (by feeding on them), and act as a balancing force in the ecosystem. If the numbers weren't constrained, it would result in the depletion of sea-grass which supports other marine life forms.</p>	<p>The learner is required to answer how tiger sharks serve to keep prey numbers in check. Here, sea turtles are stated as the prey. There is also a suggestion that there are other marine creatures like the sea turtles.</p> <ul style="list-style-type: none"> ▪ Award maximum 1 mark for the complete correct answer ▪ Award partial credit of ½ mark if just 'balancing force'/constraining number of sea turtles/ 'overgrazing the sea grass beds' / 'anchoring the ecosystem' is the response, without substantiation.

ix. Analyse why having a large litter is one of the features that empowers tiger sharks to emerge winners if global warming persists. (1 mark)

Value Points	Guidance
<p>Reduces possibility of extinction or destruction due to harsh conditions, as large numbers would ensure that some definitely survive.</p>	<p>The learner is required to examine how the tiger sharks would continue to survive despite warming of oceans if they have a large litter.</p> <ul style="list-style-type: none"> ▪ Award maximum 1 mark for the complete correct answer ▪ No partial credit

2. Based on your understanding of the passage, answer ANY SIX out of the seven questions given below.

i. What do the researchers mean by 'changing food preferences'? (1 mark)

Value Points	Guidance
<p>Urban population's transition from healthy home-cooked meals to ready-to-eat-processed foods</p>	<p>The learner is required to include the change in food habits/preferences as indicated in the text</p> <ul style="list-style-type: none"> ▪ Award 1 mark for the complete answer. ▪ No partial credit

ii. Why was this survey on the food consumption of adolescents undertaken? (1 mark)

Value Points	Guidance
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<ul style="list-style-type: none"> ▪ understand the food consumption pattern of urban adolescents and ▪ make recommendations based on the data. 	<p>The learner needs to draw on the objectives listed.</p> <ul style="list-style-type: none"> ▪ Award ½ mark for each point, to a maximum of 1 mark ▪ ½ mark partial credit if one point is stated
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iii. With reference to fig.1, write one conclusion about students' consumption of energy-dense drinks. (1 mark)

Value Points	Guidance
<p>Close to 47% drink three or more servings of energy dense beverages while a mere 5% said 'no' to more than one serving of the beverage.</p>	<p>The learner needs to analyse the energy dense drinks' graph and compare consumption trend, to analyse.</p> <ul style="list-style-type: none"> ▪ Award ½ mark each, for a maximum of 1 mark, for both aspects. ▪ ½ mark as partial credit for only one aspect

FOR THE VISUALLY IMPAIRED CANDIDATES

What do you understand by the term *food frequency*, as stated in lines 12-13?

<p>Refers to the rate of intake of food and beverages (drinks) consumed over a specified period of time. It could even refer to portion size.</p>	<p>The learner needs to explain, from context, the meaning of the term 'food frequency'.</p> <ul style="list-style-type: none"> ▪ Award ½ mark each, for 'rate of intake' and 'over a period of time'. ▪ ½ mark as partial credit if only 'rate of intake' or 'over a period of time' is alluded to. <p>The vocabulary used to explain the term may vary and the explanation is to be accepted if the two main aspects of the term have been addressed.</p>
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iv. What can be concluded by the 'no intake' data of fruit consumption versus energy dense snacks, with reference to fig.1? (1 mark)

Value Points	Guidance
<p>Nearly half the respondents (45%) did not consume any servings of fruit in contrast to 95% that had some form of energy dense snack.</p>	<p>The learner needs to analyse the fruit consumption graph for 'no intake' with energy dense snacks' graph for 'no intake' and compare to analyse.</p> <ul style="list-style-type: none"> ▪ Award ½ mark for each to a maximum of 1 mark ▪ ½ mark as partial credit for only one aspect

FOR THE VISUALLY IMPAIRED CANDIDATES

Comment on the significance of incorporating food literacy concepts into student curriculum.

It is important because reading about the advantages of a healthy diet would assist an increased intake of fruits and vegetables in teenagers	<p>The learner needs to explain the importance of this recommendation, based on the study.</p> <ul style="list-style-type: none"> ▪ Award ½ mark for each to a maximum of 1 mark ▪ ½ mark as partial credit for only one aspect ▪ Quoting the textual line in response, without explaining how it works, carries no credit.
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v. There were gender differences observed in the consumption of healthy foods, according to the survey. Substantiate. (1 mark)

Value Points	Guidance
Females had more nutritious dietary intake as they consumed more cereals, vegetables and fruits compared to their male counterparts.	<p>The learner needs correctly substantiate the statement with reference to the graph.</p> <ul style="list-style-type: none"> ▪ Award 1 mark for complete answer ▪ No partial credit

vi. Why is 'affordability' recommended as a significant feature of a school canteen policy? (1 mark)

Value Points	Guidance
The consumers are school children and therefore food should be affordable	<p>The learner needs to infer the reason why school canteen fare needs to be affordable.</p> <ul style="list-style-type: none"> ▪ Award 1 mark for a valid reason. ▪ No partial credit

vii. Identify a word from lines 9 - 17 indicating that the questionnaire was specifically designed to be completed by a respondent without the intervention of the researcher collecting the data. (1 mark)

Value Points	Guidance
Self-administered	<ul style="list-style-type: none"> ▪ Award 1 mark for the correct answer ▪ No partial credit

SECTION B – WRITING

This questions in this section address the following writing LOs:

1. convey ideas convincingly using appropriate layout as relevant
- 2) organize the content and structure the ideas logically, sequentially, cohesively
- 3) use a range of vocabulary and sentence structure appropriate to the content and the context
- 4) make accurate use of spelling, punctuation and grammar

3. You are Natasha, residing in Pune. Your cousin, from the same city is hosting your grandmother's eightieth birth anniversary and has extended an invite to you. He has also requested your assistance for arrangements needed. Draft a reply of acceptance, in not more than 50 words. (3 marks)

Content -2	Expression-1	Accuracy *
Value Points		

- Reference to invitation
- Acceptance of invitation

- Confirmation of date, time and venue
- Comment on extending assistance

▪ **Content** (as listed in value points) –
½ mark *4=2 marks

▪ **Expression**- 1 mark

use of appropriate functional language to show

(i) acknowledgement/ gratitude for invite- *thank you*

(ii) acceptance- *would love to / delighted to/nothing can stop me from attending etc.*

(iii) confirming assistance- *gladly/ goes without saying/ just let me know how I can help/ goes without saying etc.*

- ✓ full credit of 1 mark to be allotted if the functional language/ expressions has/ have been used consistently, throughout.
 - ✓ Partial credit of ½ mark to be allotted if the functional language/ expressions has/have been used generally, in most places.
 - ✓ No credit of marks if the functional language/ expressions has/ have been used sporadically/ not at all.
- **Accuracy*** - Deductions up to 1 mark from overall score
- ✓ Deduct ½ mark from total marks if all or either one of the following apply:
 - the reply is not formatted correctly as an informal letter/ largely in informal letter format
 - has a few inaccurate spellings and grammatical structures
 - ✓ Deduct 1 mark from total marks if all or either one of the following apply:
 - the reply is not in informal letter format/ has a fair number of format inaccuracies
 - has a total of 3 or more spelling/ grammatical errors

4. Attempt **ANY ONE** from A and B given below.

(5 marks)

A. You are Shantanu, residing at Ghar B-94, Balimela Road, Malkangiri. You come across the following classified advertisement in a local daily. Write a letter, in 120–150 words, applying for the position of a volunteer for the *Each One Teach One* campaign.

SITUATION VACANT

WANTED committed volunteers, aged 18 years and above, to teach underprivileged children, for one hour a week, in the district of Malkangiri. Ability to speak, read and write Odiya fluently, important. Experience not required. All volunteers to receive training. Contact Nethra N, Coordinator (*Each One Teach One*), 4Literacy, Ambaguda, Malkangiri, Odisha -764045

Content -2 Expression-2 Accuracy -1

Value points- Content

- Covering Letter
- Reference to the advertisement
- Conveying suitability for the position
- Submission of application
- Resume / Bio data as separate enclosure
- Profile of self
- Educational Qualifications
- Any other relevant information

Descriptors for Content

NOTE-Dedicated marks at a level are to be awarded only if **ALL** descriptors match. If one or more descriptors do not match, the marks are awarded at a **level lower**.

2 marks

- ✓ All points included
- ✓ Well-developed with sustained clarity

1½ marks

- ✓ Almost all points incorporated
- ✓ Reasonably well-developed

1 mark

- ✓ Some points incorporated
- ✓ Fair attempt at developing ideas with some impact on clarity of response

½ mark

- ✓ Most of the points of the given task not incorporated
- ✓ Limited awareness of task development

Expression -2 marks

Marks	Descriptors for Expression
<p>NOTE-Dedicated marks at a level are to be awarded only if ALL descriptors match. If one or more descriptors do not match, the marks are awarded at a level lower.</p>	
2	<ul style="list-style-type: none"> • Highly effective style capable of conveying the ideas convincingly with appropriate layout of a formal letter viz. addresses, salutation, subscription, and ending. • Carefully structured content with organised paragraphing presented cohesively. • Highly effective register (formal tone and vocabulary), relevant and appropriate sentences for conveying the ideas precisely and effectively.
1 ½	<ul style="list-style-type: none"> • Frequent clarity of expression most of the times, layout of a formal letter largely accurate. • Ideas generally well sequenced and related to the given topic maintaining overall cohesion of ideas. • Range of vocabulary is mostly relevant and conveys the overall meaning and the purpose of the writing.
1	<ul style="list-style-type: none"> • Inconsistent style, expression sometimes awkward, layout of a formal letter basically accurate. • Sequencing of ideas is somewhat clear and related to the given topic attempting to maintain a general overall cohesion. • Range of vocabulary is limited but manages to convey the overall meaning and the purpose of the writing.
½	<ul style="list-style-type: none"> • Expression unclear, layout partially followed affecting the format of the letter. • Poor sequencing of ideas but ideas are related to the given topic in a disjointed manner exhibiting a lack of coherence of ideas. • Very limited vocabulary or copying from the question.

Accuracy -1 mark

Descriptors for Accuracy

1 mark

- ✓ Spelling, punctuation and grammar consistently/largely accurate, with occasional minor errors, that do not impede communication.

½ mark

- ✓ Spelling, punctuation and grammar display some errors spread across, causing minor impediments to the message communicated.

No credit

- ✓ Frequent errors in spelling, punctuation and grammar, impeding communication.

B. The efforts of 400 volunteers working with the NGO, *4Literacy*, in the district of Malkangiri, Odisha, was lauded by the District Collector, Shri V. Singh (IAS). As the staff reporter of 'The Odisha Bhaskar', write a report in 120-150 words covering all details of the event, such as the training, teaching and infrastructure involved in the '*Each One Teach One*' campaign, initiated by the district administration in association with the NGO.

Value Points

- what - the efforts of 400 volunteers in the *Each One Teach One* campaign lauded by the District Collector
- who were taught and what was taught
- when & where
- details of the volunteer work
- training received by the volunteers by the NGO and district administration
- the infrastructure – classrooms, blackboard etc.
- Any other **valid** relevant information

Descriptors for Content

NOTE-Dedicated marks at a level are to be awarded only if **ALL** descriptors match. If one or more descriptors do not match, the marks are awarded at **a level lower**.

2 marks

- ✓ All points included
- ✓ Well-developed with sustained clarity

1½ marks

- ✓ Almost all points incorporated
- ✓ Reasonably well-developed

1 mark

- ✓ Some points incorporated
- ✓ Fair attempt at developing ideas with some impact on clarity of response

½ mark

- ✓ Most of the points of the given task not incorporated
- ✓ Limited awareness of task development

Expression -2 marks

Marks	Descriptors for Expression
NOTE -Dedicated marks at a level are to be awarded only if ALL descriptors match. If one or more descriptors do not match, the marks are awarded at a level lower .	
2	<ul style="list-style-type: none"> Highly effective style capable of conveying the ideas convincingly with appropriate layout of a newspaper report viz. headline and by-line, place, date. Carefully structured content with organised paragraphing presented cohesively. Highly effective register (formal tone, tense, and vocabulary), relevant and appropriate sentences for conveying the ideas precisely and effectively.
1 ½	<ul style="list-style-type: none"> Frequent clarity of expression most of the times, layout of a newspaper report largely accurate. Ideas generally well sequenced and related to the given topic maintaining overall cohesion of ideas. Range of vocabulary is mostly relevant and conveys the overall meaning and the purpose of the writing.
1	<ul style="list-style-type: none"> Inconsistent style, expression sometimes awkward, layout of a newspaper report basically accurate. Sequencing of ideas is somewhat clear and related to the given topic attempting to maintain a general overall cohesion. Range of vocabulary is limited but manages to convey the overall meaning and the purpose of the writing.
½	<ul style="list-style-type: none"> Expression unclear, layout partially followed affecting the format of the newspaper report. Poor sequencing of ideas but ideas are related to the given topic in a disjointed manner exhibiting a lack of coherence of ideas. Very limited vocabulary or copying from the question.
Accuracy -1 mark	
Descriptors for Accuracy	
1 mark	<ul style="list-style-type: none"> ✓ Spelling, punctuation and grammar consistently/largely accurate, with occasional minor errors, that do not impede communication.
½ mark	<ul style="list-style-type: none"> ✓ Spelling, punctuation and grammar display some errors spread across, causing minor impediments to the message communicated.
No credit	<ul style="list-style-type: none"> Frequent errors in spelling, punctuation and grammar, impeding communication.

SECTION C - LITERATURE

5. Attempt **ANY FIVE** of the six questions given below, within 40 words each. (2 marks each) x 5= 10 marks

i. A mistaken identity led to a discovery of a new one for the rattrap peddler. How did this impact him?

Value Points	Guidance
<ul style="list-style-type: none"> Gave him the power to clear his conscience Brought out his latent goodness 	The examiner knows about the mistaken identity, hence that requires no elaboration here.

<ul style="list-style-type: none"> • Lent him conviction to become a better human/ a chance at elevating himself from being a thief • Allowed him the opportunity to behave in a dignified manner befitting that of a Captain 	<p>The response needs to address how the mistaken identity effected/ influenced him.</p> <p>Content - Award 1 mark for inclusion of any one impact with explanation. Award ½ mark if the impact is listed without explanation.</p> <p>Expression – 1 mark when both given aspects are included. ✓ Answer organised effectively ✓ usage of words for effect-cause (due to, as a result, owing to, therefore etc.) ½ mark when either aspect is missing</p> <p>Deduct ½ mark from the overall score if the error density is high (more than a total of 2 spellings and/or grammatical errors).</p>
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ii. As the host of a talk show, introduce Rajkumar Shukla to the audience by stating any two of his defining qualities. You may begin your answer like this:

Meet Rajkumar Shukla, the man who played a pivotal role in the Champaran Movement. He

Value Points	Guidance
<ul style="list-style-type: none"> • Determined/ Resolute • Persevering • Dedicated • Any other valid quality 	<p>The examiner knows the sequence of incidents that transpired, and the role of Gandhi, hence that requires no elaboration here.</p> <p>The question requires characteristics of Rajkumar Shukla, as inferred from the text written as introductory lines to be spoken.</p> <p>Content - Award 1 mark for 2 valid qualities. Award ½ mark for one valid.</p> <p>Expression – 1 mark when both given aspects are included ✓ Answer organised effectively ✓ The language usage needs to display a semi-formal tone + language for introduction ½ mark when either aspect is missing</p> <p>Deduct ½ mark from the overall score if the error density is high (more than a total of 2 spellings and/or grammatical errors).</p>

iii. Adrienne Rich chose to express her silent revolt through her poem, *Aunt Jennifer's Tigers*, just as Aunt Jennifer did with her embroidery. Explain.

Value Points	Guidance
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<p>Adrienne Rich, through her poem, criticizes the traditional institution of marriage, in her times, suggesting that it oppresses women. Similarly, Aunt Jennifer, a victim of an unhappy marriage, under a domineering husband, chooses embroidery to vent her angst. Both use their creative outlet as a form of protest against societal expectations.</p>	<p>Both the poet's and Aunt Jennifer's point of view to be expressed.</p> <p>Content - Award 1 mark for both aspects compared. Award ½ mark for elaboration on only one aspect.</p> <p>Expression – 1 mark when both given aspects are included</p> <ul style="list-style-type: none"> ✓ Answer organised effectively ✓ The language usage needs to display comparison (similarly/ just like etc.) <p>½ mark when either aspect is missing</p> <p>Deduct ½ mark from the overall score if the error density is high (more than a total of 2 spellings and/or grammatical errors).</p>
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iv. Rationalize why Keats uses the metaphor 'an endless fountain of immortal drink' in his poem, *A Thing of Beauty*.

Value Points	Guidance
<ul style="list-style-type: none"> • Things of beauty are just like the immortal drink of the gods that flow continuously and never die • Just as the endless fountain of immortality is an elixir of life, similarly things of beauty are constant/ perennial in providing everlasting joy/ motivation/bliss 	<p>The question requires an answer to how beauty is perennial.</p> <p>Content - Award 1 mark for stating the reason with valid explanation. Award ½ mark for just stating minus explanation.</p> <p>Expression – 1 mark when both given aspects are included</p> <ul style="list-style-type: none"> ✓ Answer organised effectively ✓ The language usage needs to display rationalisation via comparison (just as/ similarly/ like) <p>½ mark when either aspect is missing</p> <p>Deduct ½ mark from the overall score if the error density is high (more than a total of 2 spellings and/or grammatical errors).</p>

v. How do you think Derry's mother contributes to his sense of alienation and isolation? (*On the Face of It*)

Value Points	Guidance
<ul style="list-style-type: none"> • Mother is overprotective and doesn't understand her son's longing for companionship. • She treats him with a sense of pity and robs him of his dignity by perpetually treating him like a helpless victim 	<p>The question requires inferring how the actions of Derry's mother led to the development of feelings of alienation and isolation in her son.</p> <p>The learner would be required to draw upon textual evidence to infer.</p> <p>Content -</p>

	<p>Award 1 mark for 2 valid points. Award ½ mark for 1 valid point.</p> <p>Expression – 1 mark when both given aspects are included</p> <ul style="list-style-type: none"> ✓ Answer organised effectively ✓ The language usage needs to display stating of inference (based on...I believe that/.... reveals that.... etc.) <p>½ mark when either aspect is missing</p> <p>Deduct ½ mark from the overall score if the error density is high (more than a total of 2 spellings and grammatical errors).</p>
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vi. Validate John Updike’s open-ended title, ‘Should Wizard Hit Mommy?’.

Value Points

<p>The story title is a question that suggests agreeing with Jo, who believes in justice for the skunk, or the father, who believes that mothers cannot err. Both seem right.</p> <p>The author leaves it open-ended for the reader to allow flexibility and creative insight (any other valid purpose)</p>	<p>The question requires an opinion from the learner in favour of leaving the title open-ended (‘validate’)</p> <p>Content - Award 1 mark for identification of the title as a question that could have varying answers + likely purpose of writer. Award ½ mark for either aspect.</p> <p>Expression – 1 mark when both given aspects are included</p> <ul style="list-style-type: none"> ✓ Answer organised effectively ✓ The language usage needs to display justification <p>½ mark when either aspect is missing</p> <p>Deduct ½ mark from the overall score if the error density is high (more than a total of 2 spellings and grammatical errors).</p>
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LONG QUESTIONS No. 6 (i-iii) (ANY TWO - 4 marks each)

Content 2

Expression & Accuracy 2

Note-

- ✓ Use the given descriptors to mark the LQs. For CONTENT (refer to Value points) and EXPRESSION
- ✓ If the response does not justify **all** points of a level, the response is **marked down**.

DESCRIPTORS FOR CONTENT (with reference to value points)	MARK
<ul style="list-style-type: none"> • Sustained, clear, well-developed personal response to the task • Well-developed and justified arguments/evidence for the characters 	2
<ul style="list-style-type: none"> • Largely, a reasonably well-developed personal response to the task • Clear justification with arguments/evidence for the characters 	1 ½
<ul style="list-style-type: none"> • Fairly competent personal response to the task 	1

<ul style="list-style-type: none"> • Clear justification with restricted arguments/evidence for the characters 	
<ul style="list-style-type: none"> • Limited awareness of the task • Limited justification or relevant arguments/evidence for the characters 	½
DESCRIPTORS FOR EXPRESSION (Coherence & Cohesion + Accuracy)	MARKS
<ul style="list-style-type: none"> • Carefully structured content with a beginning, middle and end with highly relevant ideas presented cohesively. • Highly effective vocabulary usage, relevant and appropriate sentences for conveying the ideas precisely and effectively. • Spelling, punctuation and grammar are almost always accurate 	2
<ul style="list-style-type: none"> • Ideas generally well sequenced and related to the given topic maintaining overall cohesion of ideas. • Range of vocabulary suffices in large parts to convey the overall idea and meaning • Spelling, punctuation and grammar mostly accurate, with occasional minor errors but does not impede communication 	1 ½
<ul style="list-style-type: none"> • Ideas sequenced fairly well and related to the given topic, sometimes maintaining cohesion of ideas. • Range of vocabulary is limited and conveys a basic idea of the overall meaning • Spelling, punctuation and grammar fairly accurate, with occasional minor errors but does not impede communication 	1
<ul style="list-style-type: none"> • Poor sequencing of ideas; though related to the given topic, expressed in a disjointed manner exhibiting a lack of coherence of ideas. • Very limited expected/ topical vocabulary as per question asked • A lot of errors in spelling, punctuation and grammar that impede communication. 	½

6 (i). How does Keats' poem, *A Thing of Beauty* appeal richly to the senses, stimulating the reader's inner sight as well as the sense of touch and smell? Write your answer in about 120-150 words.

Value Points

Introduction

Keats' descriptions allow for a deeper perception of the imaginary, converting it into a life-like experience stimulating the reader's inner sight as well as the sense of touch and smell.

Justification (any 2-3)

- Keats establishes this with powerful imagery and word play
- The cooling comfort of the bower, dancing daffodils in its green environs, the babbling stream and the mid-forest brake with the musk rose blooms evoke our imagination, sense of hearing, touch and smell.
- The stories of mighty and the doom that befalls them appeals to our intellect
- The endless fountain may be an allusion of the fountain of youth however it has a sublimating effect on the reader.
- Keats poetic descriptions presents beauty that appeals to our senses and gives delight.

(Accept associated **relevant** points)

6. (ii). Colin Dexter, the author of *Evans Tries an O-level* employs the red herring technique of intentionally misleading readers by placing false clues to keep the plot enigmatic. Substantiate with reference to text, in about 120-150 words.

Value Points

Introduction

The stage is set - a maximum security prison and a kleptomaniac with a record of breaking out of prison

Analysis (any 3-4)

- Evans' grubby appearance, jovial manner and friendly banter distracts from sharp intelligence and extraordinary talent for deception
- The silly but filthy looking bobble hat (a knit beanie with a pom-pom on top) distracts, giving readers the appearance of a comical character
- 'Number two Handkerchief' neatly placed on the bed, where's number one?
- The first mention of Reverend Stuart McLeery exiting his bachelor flat in Broad Street.
- Mention of the nail file and then reference to McLeery's meticulously manicured fingers
- Illusion of Mc Leery having grown thinner and then 'Mc Leery' slumped in a chair
- Clues in the question paper, a chase all over town

(Accept similar **relevant** points)

Conclusion

Colin Dexter's Evan's Tries an O-level – a creative and highly complicated prison break interspersed with twists in the plot.

6. (iii). Biographies include features of non-fiction texts – factual information and different text structures such as description, sequence, comparison, cause and effect, or problem and solution. Examine *Indigo* in the light of this statement, in about 120-150 words.

Value Points**Introduction**

Focus on *Indigo* being an excerpt of a biography and thus having features of fiction as well as non-fiction texts.

Examination

Substantiation to support the point that it includes—

- Factual information (any 2)
- Text structures (examples of any 2 different features)
 - ✓ explanation;
 - ✓ content recorded in order of occurrence;
 - ✓ points of comparison between people;
 - ✓ action and impact;
 - ✓ problem-solution/ conflict resolution

(The learner is expected to elaborate on both aspects—factual information + text structure)

Conclusion

Reiterating that *Indigo* does include features of a non-fiction text.

प्रतिदर्श प्रश्न पत्र 2021-22

विषय - हिंदी (आधार)

(विषय कोड - 302)

कक्षा - बारहवीं

निर्धारित समय : 2 घंटे

अधिकतम अंक : 40

अंक

सामान्य निर्देश :-

- निम्नलिखित निर्देशों को बहुत सावधानी से पढ़िए और उनका पालन कीजिए :-
- इस प्रश्न पत्र में वर्णनात्मक प्रश्न पूछे गए हैं।
- इस प्रश्न पत्र में कुल **07** प्रश्न पूछे गए हैं। आपको **07** प्रश्नों के उत्तर देने हैं।
- प्रश्नों में आंतरिक विकल्प भी दिए गए हैं। निर्देशानुसार उत्तर दीजिए।

प्रश्न संख्या	कार्यालयी हिंदी और रचनात्मक लेखन	अंक (20)
प्रश्न 1.	निम्नलिखित दिए गए 03 शीर्षकों में से किसी 01 शीर्षक का चयन कर लगभग 200 शब्दों का एक रचनात्मक लेख लिखिए :- <ul style="list-style-type: none">• प्रातः काल योग करते लोग• दुर्घटना से देर भली• जिन्हें जल्दी थी, वे चले गए	5x1=5
प्रश्न 2.	अपने क्षेत्र के मुख्य चिकित्सा अधिकारी, उनके चिकित्सकों और सहायक कर्मचारियों को कोरोना काल में उनके द्वारा किये गए कार्यों की प्रशंसा और सरहाना करते हुए एक पत्र लिखिए। <i>अथवा</i>	5x1=5

	बस चालकों की असावधानी से हो रही दुर्घटनाओं पर चिंता व्यक्त करते हुए किसी समाचार पत्र के संपादक को पत्र लिखिए।	
प्रश्न 3. (i)	कहानी की परिभाषा बताते हुए इसके तत्त्वों के नाम लिखें। अथवा नाटक में अभिनय और संवाद योजना के महत्त्व को रेखांकित कीजिए।	3x1=3
प्रश्न 3. (ii)	रेडियो नाटक की अवधि छोटी क्यों रखी जाती है? अथवा कहानी में क्लाइमेक्स का क्या महत्त्व है?	2x1=2
प्रश्न 4. (i)	समाचार लेखन की रचना प्रक्रिया को स्पष्ट कीजिए। अथवा फ़ीचर कैसे लिखा जाता है?	3x1=3
प्रश्न 4. (ii)	समाचार और फ़ीचर में मुख्य अंतर क्या होता है? अथवा समाचार लेखन के छः ककार कौन से हैं?	2x1=2
प्रश्न संख्या	पाठ्यपुस्तक आरोह भाग - 2 तथा अनुपूरक पाठ्यपुस्तक वितान भाग - 2	अंक (20)
प्रश्न 5.	निम्नलिखित 03 प्रश्नों में से किन्हीं 02 प्रश्नों के उत्तर दीजिए।	3x2=6
(i)	शमशेर की कविता 'उषा' गाँव के जीवन का जीवंत चित्रण है। पुष्टि कीजिए।	3
(ii)	'कवितावली' के आधार पर सिद्ध कीजिए कि तुलसीदास को अपने समय की आर्थिक-सामाजिक समस्याओं की समझ थी।	3
(iii)	फ़िराक की गज़ल में अपना परदा खोलने से क्या आशय है?	3
प्रश्न 6.	निम्नलिखित 04 प्रश्नों में से किन्हीं 03 प्रश्नों के उत्तर दीजिए।	3x3=9
(i)	जाति प्रथा को श्रम विभाजन का ही एक अंग न मानने के पीछे डॉ. आंबेडकर के क्या तर्क थे?	3
(ii)	नमक कहानी में नमक की पुड़िया इतनी महत्त्वपूर्ण क्यों हो गई थी? कस्टम अधिकारी उसे लौटाते हुए भावुक क्यों हो उठा था?	3
(iii)	बाबा भीमराव आंबेडकर के अनुसार उनकी कल्पना का आदर्श समाज	3

	कैसा होना चाहिए? अपने शब्दों में अभिव्यक्त करें।	
(iv)	'ढोल में तो जैसे पहलवान की जान बसी थी।' 'पहलवान की ढोलक' पाठ के आधार पर तर्क सहित पंक्ति को सिद्ध कीजिए।	3
प्रश्न 7.	निम्नलिखित प्रश्नों के उत्तर दीजिए।	3+2=5
(i)	एन फ्रैंक की डायरी किट्टी को संबोधित कर ही क्यों लिखी गई है? यह डायरी वह किसी अपने को भी संबोधित कर सकती थी? तर्क सहित उत्तर दीजिए। <i>अथवा</i> मोहनजोदाड़ो की सभ्यता को लो - प्रोफाइल सभ्यता क्यों माना गया है?	3x1=3
(ii)	"काश, कोई तो होता जो मेरी भावनाओं को गंभीरता से समझ पाता। अफ़सोस, ऐसा व्यक्ति मुझे अब तक नहीं मिला।" एन फ्रैंक की इस पंक्ति का आशय स्पष्ट करें। <i>अथवा</i> सिंधु सभ्यता के केंद्र में समाज था, राजा या धर्म नहीं! सिद्ध कीजिए।	2x1=2

प्रतिदर्श प्रश्न पत्र 2021-22

विषय - हिंदी (आधार)

(विषय कोड - 302)

कक्षा – बारहवीं

अंक योजना

निर्धारित समय : 2 घंटे

अधिकतम अंक : 40 अंक

सामान्य निर्देश :-

- अंक योजना का उद्देश्य मूल्यांकन को अधिकाधिक वस्तुनिष्ठ बनाना है।
- वर्णनात्मक प्रश्नों के अंक योजना में दिए गए उत्तर-बिंदु अंतिम नहीं हैं। ये सुझावात्मक एवं सांकेतिक हैं।
- यदि परीक्षार्थी इन सांकेतिक बिंदुओं से भिन्न, किंतु उपयुक्त उत्तर दे तो उसे अंक दिए जाएँ।
- मूल्यांकन कार्य निजी व्याख्या के अनुसार नहीं, बल्कि अंक-योजना में निर्दिष्ट निर्देशानुसार ही किया जाए।

प्रश्न संख्या	कार्यालयी हिंदी और रचनात्मक लेखन	अंक (20)
प्रश्न 1.	किसी <u>एक</u> विषय पर लगभग 150 शब्दों में रचनात्मक लेख लिखिए:- भूमिका - 1 अंक विषयवस्तु - 3 अंक भाषा - 1 अंक	5x1=5
प्रश्न 2.	2 में से किसी 1 विषय पर पत्र (लगभग 80-100 शब्द-सीमा) आरंभ और अंत की औपचारिकताएँ - 1 अंक	5x1=5

	विषयवस्तु - 3 अंक भाषा - 1 अंक	
प्रश्न 3. (i)	<p>कहानी गद्य साहित्य की वह सबसे अधिक रोचक एवं लोकप्रिय विधा है, जो जीवन के किसी विशेष पक्ष का मार्मिक, भावनात्मक और कलात्मक वर्णन करती है। "हिन्दी गद्य की वह विधा है जिसमें लेखक किसी घटना, पात्र अथवा समस्या का क्रमबद्ध ब्यौरा देता है, जिसे पढ़कर एक समन्वित प्रभाव उत्पन्न होता है, उसे कहानी कहते हैं"।</p> <ul style="list-style-type: none"> ○ कथावस्तु ○ चरित्र-चित्रण ○ कथोपकथन ○ देशकाल ○ भाषा-शैली ○ उद्देश्य <p style="text-align: center;">अथवा</p> <p>अभिनय किसी अभिनेता या अभिनेत्री के द्वारा किया जाने वाला वह कार्य है जिसके द्वारा वे किसी कथा को दर्शाते हैं, साधारणतया किसी पात्र के माध्यम से। अभिनय का उद्देश्य होता है किसी पद या शब्द के भाव को मुख्य अर्थ तक पहुँचा देना; अर्थात् दर्शकों या सामाजिकों के हृदय में भाव या अर्थ से अभिभूत करना"।</p> <p>संवाद – नाटक में नाटकार के पास अपनी और से कहने का अवकाश नहीं रहता। वह संवादों द्वारा ही वस्तु का उद्घाटन तथा पात्रों के चरित्र का विकास करता है। अतः इसके संवाद सरल , सुबोध , स्वभाविक तथा पात्रानुकूल होने चाहिए।</p>	3x1=3
प्रश्न 3. (ii)	<p>श्रव्य माध्यम में मनुष्य की एकाग्रता सीमित होती है।</p> <p style="text-align: center;">अथवा</p> <p>चरम उत्कर्ष या क्लाइमेक्स कहानी का अंतिम तत्त्व होता है। इसमें कहानी के उद्देश्य की अभिव्यक्ति होती है। कहानी का उद्देश्य मनोरंजन के साथ साथ जीवन-संबंधी अनुभूतियों से मानव-मन का निकट परिचय कराना है।</p>	2x1=2
प्रश्न 4. (i)	<ul style="list-style-type: none"> ○ उल्टा पिरामिड शैली ○ इंद्रो , बॉडी और समापन 	3x1=3

	<u>अथवा</u>	
	<p>फीचर लेखन किसी कहानी , उपन्यास की तरह ही कुछ बिंदुओं पर आधारित होता है- आरंभ, मध्य, चरम, समापन, भाषा – शैली, नेता तथा निष्कर्ष। फीचर लेखन का आरंभ किसी घटना, यात्रा आदि पर आधारित होता है। आरंभ में पाठक को कुछ ऐसी घटना का जिक्र करना चाहिए जिससे पूरा लेख पढ़ने की उत्सुकता पाठक के मन में बरकरार रहे।</p>	
प्रश्न 4. (ii)	<p>समाचार और फीचर में प्रमुख अंतर प्रस्तुतीकरण की शैली और विषयवस्तु की मात्रा का होता है। जहाँ उल्टा पिरामिड शैली में लिखा गया समाचार किसी विषय अथवा घटना को संक्षिप्त रूप में प्रस्तुत करता है, वहीं फीचर उस समाचार को विस्तार से प्रस्तुत करता है।</p> <p style="text-align: center;"><u>अथवा</u></p> <p>चार ककार (क्या, कब, कौन, कहाँ) सूचनात्मक व अन्तिम दो ककार (क्यों, कैसे) विवरणात्मक होते हैं।</p>	2x1=2
प्रश्न संख्या	पाठ्यपुस्तक आरोह भाग - 2 तथा अनुपूरक पाठ्यपुस्तक वितान भाग - 2	अंक (20)
प्रश्न 5.	निम्नलिखित 03 प्रश्नों में से किन्हीं 02 प्रश्नों के उत्तर दीजिए।	3x2=6
(i)	<p>राख से लीपा हुआ चौका</p> <p>बहुत काली सिल</p> <p>स्लेट पर या लाल खड़िया चाक मलना</p> <p>किसी की गौर झिलमिल देह का हिलना</p>	3
(ii)	<p>‘कवितावली’ में उद्धृत छंदों के अध्ययन से पता चलता है कि तुलसीदास को अपने युग की आर्थिक विषमता की अच्छी समझ है। उन्होंने समकालीन समाज का यथार्थपरक चित्रण किया है। वे समाज के विभिन्न वर्गों का वर्णन करते हैं जो कई तरह के कार्य करके अपना निर्वाह करते हैं। तुलसी दास तो यहाँ तक बताते हैं कि पेट भरने के लिए लोग गलत-सही सभी कार्य करते हैं। उनके समय में भयंकर गरीबी व बेरोजगारी थी। गरीबी के कारण लोग अपनी संतानों तक को बेच देते थे। बेरोजगारी इतनी अधिक थी कि लोगों को भीख तक नहीं मिलती थी। दरिद्रता रूपी रावण ने हर तरफ हाहाकार मचा रखा था।</p>	3
(iii)	परदा खोलने से आशय है – अपने बारे में बताना। यदि कोई व्यक्ति किसी दूसरे	3

	की निंदा करता है या बुराई करता है। तो वह स्वयं की बुराई कर रहा है। इसीलिए शायर ने कहा कि मेरा परदा खोलने वाले अपना परदा खोल रहे हैं।	
प्रश्न 6.	निम्नलिखित 04 प्रश्नों में से किन्हीं 03 प्रश्नों के उत्तर दीजिए।	3x3=9
(i)	1. जाति प्रथा श्रम का ही विभाजन नहीं करती बल्कि यह श्रमिक को भी बाँट देती है 2. जाति प्रथा में श्रम का जो विभाजन किया गया है, वह व्यक्ति की रुचि को ध्यान में रखकर नहीं किया गया है। 3. जाति प्रथा में पेशे का निर्धारण एक मनुष्य को जीवनभर के लिए दे दिया जाता है।	3
(ii)	इस कहानी में नमक की पुड़िया के महत्वपूर्ण बनने का यह कारण है कि भारत-पाक के बीच नमक का व्यापार गैरकानूनी था। दूसरे, यह विभाजन की यादों से जुड़ी है। कस्टम अधिकारी नमक की पुड़िया लौटाते हुए भावुक हो उठा क्योंकि हर व्यक्ति को जन्मभूमि से लगाव होता है। उस प्रेम की अनुभूति से वह भावुक हो उठा।	3
(iii)	उनका यह आदर्श समाज स्वतंत्रता, समता व भ्रातृता पर आधारित होगा।	3
(iv)	पहलवान का सारा जीवन ही ढोल की आवाज़ से उठता - गिरता है, पहलवान की ढोलक पूरे गाँव में संजीवनी बूटी का कार्य करती है, ढोल की थाप से पहलवान की कुश्ती के दाँव-पेंच निश्चित होते थे।	3
प्रश्न 7.	निम्नलिखित प्रश्नों के उत्तर दीजिए।	3+2=5
(i)	अपनी डायरी में अपनी गुड़िया को वह पत्र लिखती है। गुड़िया को पत्र लिखते हुए अपरोक्ष रूप से वह खुद से ही बातें करती है। वह जानती है कि जिन बातों को वह लिख रही है, शायद उन्हें दूसरे व्यक्ति ठीक ढंग से न समझ पायें। इसीलिए उसे अपनी गुड़िया को संबोधित करते हुए पत्र लिखना पड़ा। अथवा लेखक ने सिंधु सभ्यता को 'लो प्रोफाइल' सभ्यता कहा है। संसार के अन्य स्थानों पर खुदाई करने से राजतंत्र को प्रदर्शित करने वाले महल, धर्म की ताकत दिखाने	3x1=3

	<p>वाले पूजा स्थल, मूर्तियाँ तथा पिरामिड मिले हैं। मोहनजोदड़ो में ऐसी कोई चीज नहीं मिली है जो राजसत्ता या धर्म के प्रभाव को दर्शाती है।</p>	
(ii)	<p>अकेलापन ही ऐन फ्रैंक के डायरी लेखन का कारण बना। यद्यपि वह अपने परिवार और वॉन दंपत्ति के साथ अज्ञातवास में दो वर्षों तक रही लेकिन इस दौरान किसी ने उसकी भावनाओं को समझने का प्रयास नहीं किया। पीटर यद्यपि उससे प्यार करता है लेकिन केवल दोस्त की तरह। जबकि हर किसी की शारीरिक जरूरतें होती हैं लेकिन पीटर उसकी इस जरूरत को नहीं समझ सका। माता-पिता और बहन ने भी कभी उसकी भावनाओं को गंभीरता से नहीं। समझी शायद इसी कारण वह डायरी लिखने लगी।</p> <p style="text-align: center;">अथवा</p> <p>इस सभ्यता को लेखक ने साधन-संपन्न माना है। इस सभ्यता ने भव्यता को महत्व नहीं दिया है। यह कलात्मकता को महत्व देती है। अतः हम कह सकते हैं कि यहाँ के लोग बोध कला में रुचि रखते थे। यहाँ की नगर व्यवस्था, पत्थर तथा धातु से बनी मूर्तियाँ, पशु-पक्षियों की आकृतियाँ, सुंदर मुहरें, खिलौने, बालों को सवारने का कंघा, गहने इत्यादि इसके सौंदर्य बोध का प्रमाण देते हैं। यहाँ पर आपको राजचिह्न या धर्म से संबंधित चिह्न नहीं मिलते हैं। यदि मिलते होते तो इसकी स्थिति बिलकुल अलग होती। यहाँ आम जनता से जुड़े चिह्न अधिक बिखरे हुए हैं। जिनका सौंदर्य बोध इसी कारण विद्यमान है। यह सभ्यता हर तरह से समाज-पोषित सभ्यता को दर्शाती है। यहाँ पर ताकत के चिह्न नहीं मिलते। यह सभ्यता आपसी समझ के कारण लंबे समय तक चली। यह आडंबर रहित है।</p>	2x1=2

Sample Question Paper
CLASS: XII
Session: 2021-22
Mathematics (Code-041)
Term - 2

Time Allowed: 2 hours

Maximum Marks: 40

General Instructions:

1. This question paper contains **three sections - A, B and C**. Each part is compulsory.
2. **Section - A** has 6 **short answer type (SA1)** questions of 2 marks each.
3. **Section - B** has 4 **short answer type (SA2)** questions of 3 marks each.
4. **Section - C** has 4 **long answer type questions (LA)** of 4 marks each.
5. There is an **internal choice** in some of the questions.
6. Q14 is a **case-based problem** having 2 sub parts of 2 marks each.

SECTION - A

1.	Find $\int \frac{\log x}{(1+\log x)^2} dx$ OR Find $\int \frac{\sin 2x}{\sqrt{9-\cos^4 x}} dx$	2
2.	Write the sum of the order and the degree of the following differential equation: $\frac{d}{dx} \left(\frac{dy}{dx} \right) = 5$	2
3.	If \hat{a} and \hat{b} are unit vectors, then prove that $ \hat{a} + \hat{b} = 2\cos \frac{\theta}{2}$, where θ is the angle between them.	2
4.	Find the direction cosines of the following line: $\frac{3-x}{-1} = \frac{2y-1}{2} = \frac{z}{4}$	2
5.	A bag contains 1 red and 3 white balls. Find the probability distribution of the number of red balls if 2 balls are drawn at random from the bag one-by-one without replacement.	2
6.	Two cards are drawn at random from a pack of 52 cards one-by-one without replacement. What is the probability of getting first card red and second card Jack?	2

SECTION - B

7.	Find: $\int \frac{x+1}{(x^2+1)x} dx$	3
8.	Find the general solution of the following differential equation: $x \frac{dy}{dx} = y - x \sin \left(\frac{y}{x} \right)$ OR Find the particular solution of the following differential equation, given that $y = 0$ when $x = \frac{\pi}{4}$: $\frac{dy}{dx} + y \cot x = \frac{2}{1 + \sin x}$	3
9.	If $\vec{a} \neq \vec{0}$, $\vec{a} \cdot \vec{b} = \vec{a} \cdot \vec{c}$, $\vec{a} \times \vec{b} = \vec{a} \times \vec{c}$, then show that $\vec{b} = \vec{c}$.	3

10.	<p>Find the shortest distance between the following lines: $\vec{r} = (\hat{i} + \hat{j} - \hat{k}) + s(2\hat{i} + \hat{j} + \hat{k})$ $\vec{r} = (\hat{i} + \hat{j} + 2\hat{k}) + t(4\hat{i} + 2\hat{j} + 2\hat{k})$</p> <p style="text-align: center;">OR</p> <p>Find the vector and the cartesian equations of the plane containing the point $\hat{i} + 2\hat{j} - \hat{k}$ and parallel to the lines $\vec{r} = (\hat{i} + 2\hat{j} + 2\hat{k}) + s(2\hat{i} - 3\hat{j} + 2\hat{k})$ and $\vec{r} = (3\hat{i} + \hat{j} - 2\hat{k}) + t(\hat{i} - 3\hat{j} + \hat{k})$</p>	3
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SECTION - C

11.	Evaluate: $\int_{-1}^2 x^3 - 3x^2 + 2x dx$	4
12.	<p>Using integration, find the area of the region in the first quadrant enclosed by the line $x + y = 2$, the parabola $y^2 = x$ and the x-axis.</p> <p style="text-align: center;">OR</p> <p>Using integration, find the area of the region $\{(x, y): 0 \leq y \leq \sqrt{3}x, x^2 + y^2 \leq 4\}$</p>	4
13.	Find the foot of the perpendicular from the point $(1, 2, 0)$ upon the plane $x - 3y + 2z = 9$. Hence, find the distance of the point $(1, 2, 0)$ from the given plane.	4

CASE-BASED/DATA-BASED

14.	<div style="text-align: center;">  </div> <p>Fig 1</p> <p>An insurance company believes that people can be divided into two classes: those who are accident prone and those who are not. The company's statistics show that an accident-prone person will have an accident at sometime within a fixed one-year period with probability 0.6, whereas this probability is 0.2 for a person who is not accident prone. The company knows that 20 percent of the population is accident prone.</p> <p>Based on the given information, answer the following questions.</p>	
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	(i) what is the probability that a new policyholder will have an accident within a year of purchasing a policy?	2
	(ii) Suppose that a new policyholder has an accident within a year of purchasing a policy. What is the probability that he or she is accident prone?	2

Marking Scheme
CLASS: XII
Session: 2021-22
Mathematics (Code-041)
Term - 2

SECTION – A

1.	<p>Find: $\int \frac{\log x}{(1+\log x)^2} dx$</p> <p>Solution: $\int \frac{\log x}{(1+\log x)^2} dx = \int \frac{\log x + 1 - 1}{(1+\log x)^2} dx = \int \frac{1}{1+\log x} dx - \int \frac{1}{(1+\log x)^2} dx$</p> $= \frac{1}{1+\log x} \times x - \int \frac{-1}{(1+\log x)^2} \times \frac{1}{x} \times x dx - \int \frac{1}{(1+\log x)^2} dx = \frac{x}{1+\log x} + c$ <p style="text-align: center;">OR</p> <p>Find: $\int \frac{\sin 2x}{\sqrt{9-\cos^4 x}} dx$</p> <p>Solution: Put $\cos^2 x = t \Rightarrow -2\cos x \sin x dx = dt \Rightarrow \sin 2x dx = -dt$</p> <p>The given integral $= -\int \frac{dt}{\sqrt{3^2-t^2}} = -\sin^{-1} \frac{t}{3} + c = -\sin^{-1} \frac{\cos^2 x}{3} + c$</p>	<p style="text-align: center;">1/2</p> <p style="text-align: center;">1+1/2</p> <p style="text-align: center;">1</p> <p style="text-align: center;">1</p>
2.	<p>Write the sum of the order and the degree of the following differential equation: $\frac{d}{dx} \left(\frac{dy}{dx} \right) = 5$</p> <p>Solution: Order = 2 Degree = 1 Sum = 3</p>	<p style="text-align: center;">1</p> <p style="text-align: center;">1/2</p> <p style="text-align: center;">1/2</p>
3.	<p>If \hat{a} and \hat{b} are unit vectors, then prove that $\hat{a} + \hat{b} = 2\cos \frac{\theta}{2}$, where θ is the angle between them.</p> <p>Solution: $(\hat{a} + \hat{b}) \cdot (\hat{a} + \hat{b}) = \hat{a} ^2 + \hat{b} ^2 + 2(\hat{a} \cdot \hat{b})$</p> $ \hat{a} + \hat{b} ^2 = 1 + 1 + 2\cos\theta$ $= 2(1 + \cos\theta) = 4\cos^2 \frac{\theta}{2}$ $\therefore \hat{a} + \hat{b} = 2\cos \frac{\theta}{2}$	<p style="text-align: center;">1</p> <p style="text-align: center;">1/2</p> <p style="text-align: center;">1/2</p>
4.	<p>Find the direction cosines of the following line:</p> $\frac{3-x}{-1} = \frac{2y-1}{2} = \frac{z}{4}$ <p>Solution: The given line is</p> $\frac{x-3}{1} = \frac{y-\frac{1}{2}}{1} = \frac{z}{4}$ <p>Its direction ratios are $\langle 1, 1, 4 \rangle$ Its direction cosines are</p> $\left\langle \frac{1}{3\sqrt{2}}, \frac{1}{3\sqrt{2}}, \frac{4}{3\sqrt{2}} \right\rangle$	<p style="text-align: center;">1</p> <p style="text-align: center;">1/2</p> <p style="text-align: center;">1/2</p>

5.	<p>A bag contains 1 red and 3 white balls. Find the probability distribution of the number of red balls if 2 balls are drawn at random from the bag one-by-one without replacement.</p> <p>Solution: Let X be the random variable defined as the number of red balls. Then $X = 0, 1$</p> $P(X=0) = \frac{3}{4} \times \frac{2}{3} = \frac{6}{12} = \frac{1}{2}$ $P(X=1) = \frac{1}{4} \times \frac{3}{3} + \frac{3}{4} \times \frac{1}{3} = \frac{6}{12} = \frac{1}{2}$ <p>Probability Distribution Table:</p> <table border="1" data-bbox="252 427 1345 539"> <tr> <td>X</td> <td>0</td> <td>1</td> </tr> <tr> <td>P(X)</td> <td>$\frac{1}{2}$</td> <td>$\frac{1}{2}$</td> </tr> </table>	X	0	1	P(X)	$\frac{1}{2}$	$\frac{1}{2}$	<p>1/2</p> <p>1/2</p> <p>1/2</p> <p>$\frac{1}{2}$</p>
X	0	1						
P(X)	$\frac{1}{2}$	$\frac{1}{2}$						

6.	<p>Two cards are drawn at random from a pack of 52 cards one-by-one without replacement. What is the probability of getting first card red and second card Jack?</p> <p>Solution: The required probability = P((The first is a red jack card and The second is a jack card) or (The first is a red non-jack card and The second is a jack card))</p> $= \frac{2}{52} \times \frac{3}{51} + \frac{24}{52} \times \frac{4}{51} = \frac{1}{26}$	<p>1</p> <p>1</p>
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SECTION – B

7.	<p>Find: $\int \frac{x+1}{(x^2+1)x} dx$</p> <p>Solution: Let $\frac{x+1}{(x^2+1)x} = \frac{Ax+B}{x^2+1} + \frac{C}{x} = \frac{(Ax+B)x+C(x^2+1)}{(x^2+1)x}$</p> $\Rightarrow x + 1 = (Ax + B)x + C(x^2 + 1) \quad (\text{An identity})$ <p>Equating the coefficients, we get</p> $B = 1, C = 1, A + C = 0$ <p>Hence, $A = -1, B = 1, C = 1$</p> <p>The given integral = $\int \frac{-x+1}{x^2+1} dx + \int \frac{1}{x} dx$</p> $= \frac{-1}{2} \int \frac{2x - 2}{x^2 + 1} dx + \int \frac{1}{x} dx$ $= \frac{-1}{2} \int \frac{2x}{x^2 + 1} dx + \int \frac{1}{x^2 + 1} dx + \int \frac{1}{x} dx$ $= \frac{-1}{2} \log(x^2 + 1) + \tan^{-1} x + \log x + c$	<p>1/2</p> <p>$\frac{1}{2}$</p> <p>1/2</p> <p>1+1/2</p>
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8.	<p>Find the general solution of the following differential equation:</p> $x \frac{dy}{dx} = y - x \sin\left(\frac{y}{x}\right)$ <p>Solution: We have the differential equation:</p> $\frac{dy}{dx} = \frac{y}{x} - \sin\left(\frac{y}{x}\right)$ <p>The equation is a homogeneous differential equation.</p> <p>Putting $y = vx \Rightarrow \frac{dy}{dx} = v + x \frac{dv}{dx}$</p> <p>The differential equation becomes</p> $v + x \frac{dv}{dx} = v - \sin v$ $\Rightarrow \frac{dv}{\sin v} = -\frac{dx}{x} \Rightarrow \operatorname{cosec} v dv = -\frac{dx}{x}$ <p>Integrating both sides, we get</p>	<p>1</p> <p>$\frac{1}{2}$</p>
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	<p>$\log \operatorname{cosec}v - \cot v = -\log x + \log K, K > 0$ (Here, $\log K$ is an arbitrary constant.)</p> <p>$\Rightarrow \log (cosec v - \cot v)x = \log K$</p> <p>$\Rightarrow (cosec v - \cot v)x = K$</p> <p>$\Rightarrow (cosec v - \cot v)x = \pm K$</p> <p>$\Rightarrow \left(cosec \frac{y}{x} - \cot \frac{y}{x}\right)x = C$, which is the required general solution.</p> <p style="text-align: center;">OR</p> <p>Find the particular solution of the following differential equation, given that $y = 0$ when $x = \frac{\pi}{4}$:</p> $\frac{dy}{dx} + y \cot x = \frac{2}{1 + \sin x}$ <p>Solution:</p> <p>The differential equation is a linear differential equation</p> <p>I.F. $= e^{\int \cot x dx} = e^{\log \sin x} = \sin x$</p> <p>The general solution is given by</p> $y \sin x = \int 2 \frac{\sin x}{1 + \sin x} dx$ $\Rightarrow y \sin x = 2 \int \frac{\sin x + 1 - 1}{1 + \sin x} dx = 2 \int \left[1 - \frac{1}{1 + \sin x}\right] dx$ $\Rightarrow y \sin x = 2 \int \left[1 - \frac{1}{1 + \cos\left(\frac{\pi}{2} - x\right)}\right] dx$ $\Rightarrow y \sin x = 2 \int \left[1 - \frac{1}{2 \cos^2\left(\frac{\pi}{4} - \frac{x}{2}\right)}\right] dx$ $\Rightarrow y \sin x = 2 \int \left[1 - \frac{1}{2} \sec^2\left(\frac{\pi}{4} - \frac{x}{2}\right)\right] dx$ $\Rightarrow y \sin x = 2\left[x + \tan\left(\frac{\pi}{4} - \frac{x}{2}\right)\right] + c$ <p>Given that $y = 0$, when $x = \frac{\pi}{4}$,</p> <p>Hence, $0 = 2\left[\frac{\pi}{4} + \tan \frac{\pi}{8}\right] + c$</p> $\Rightarrow c = -\frac{\pi}{2} - 2 \tan \frac{\pi}{8}$ <p>Hence, the particular solution is</p> $y = \operatorname{cosec} x \left[2 \left\{x + \tan\left(\frac{\pi}{4} - \frac{x}{2}\right)\right\} - \left(\frac{\pi}{2} + 2 \tan \frac{\pi}{8}\right)\right]$	<p>1</p> <p>$\frac{1}{2}$</p> <p>1</p> <p>$\frac{1}{2}$</p> <p>1</p> <p>$\frac{1}{2}$</p>
9.	<p>If $\vec{a} \neq \vec{0}$, $\vec{a} \cdot \vec{b} = \vec{a} \cdot \vec{c}$, $\vec{a} \times \vec{b} = \vec{a} \times \vec{c}$, then show that $\vec{b} = \vec{c}$.</p> <p>Solution: We have $\vec{a} \cdot (\vec{b} - \vec{c}) = 0$</p> <p>$\Rightarrow (\vec{b} - \vec{c}) = \vec{0}$ or $\vec{a} \perp (\vec{b} - \vec{c})$</p> <p>$\Rightarrow \vec{b} = \vec{c}$ or $\vec{a} \perp (\vec{b} - \vec{c})$</p> <p>Also, $\vec{a} \times (\vec{b} - \vec{c}) = \vec{0}$</p> <p>$\Rightarrow (\vec{b} - \vec{c}) = \vec{0}$ or $\vec{a} \parallel (\vec{b} - \vec{c})$</p> <p>$\Rightarrow \vec{b} = \vec{c}$ or $\vec{a} \parallel (\vec{b} - \vec{c})$</p> <p>$\vec{a}$ can not be both perpendicular to $(\vec{b} - \vec{c})$ and parallel to $(\vec{b} - \vec{c})$</p> <p>Hence, $\vec{b} = \vec{c}$.</p>	<p>1</p> <p>1</p> <p>1</p>
10.	<p>Find the shortest distance between the following lines:</p> $\vec{r} = (\hat{i} + \hat{j} - \hat{k}) + s(2\hat{i} + \hat{j} + \hat{k})$ $\vec{r} = (\hat{i} + \hat{j} + 2\hat{k}) + t(4\hat{i} + 2\hat{j} + 2\hat{k})$	

	<p>Solution: Here, the lines are parallel. The shortest distance = $\frac{ (\vec{a}_2 - \vec{a}_1) \times \vec{b} }{ \vec{b} }$</p> $= \frac{ (3\hat{k}) \times (2\hat{i} + \hat{j} + \hat{k}) }{\sqrt{4 + 1 + 1}}$ $(3\hat{k}) \times (2\hat{i} + \hat{j} + \hat{k}) = \begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ 0 & 0 & 3 \\ 2 & 1 & 1 \end{vmatrix} = -3\hat{i} + 6\hat{j}$ <p>Hence, the required shortest distance = $\frac{3\sqrt{5}}{\sqrt{6}}$ units OR</p> <p>Find the vector and the cartesian equations of the plane containing the point $\hat{i} + 2\hat{j} - \hat{k}$ and parallel to the lines $\vec{r} = (\hat{i} + 2\hat{j} + 2\hat{k}) + s(2\hat{i} - 3\hat{j} + 2\hat{k})$ and $\vec{r} = (3\hat{i} + \hat{j} - 2\hat{k}) + t(\hat{i} - 3\hat{j} + \hat{k})$</p> <p>Solution: Since, the plane is parallel to the given lines, the cross product of the vectors $2\hat{i} - 3\hat{j} + 2\hat{k}$ and $\hat{i} - 3\hat{j} + \hat{k}$ will be a normal to the plane</p> $(2\hat{i} - 3\hat{j} + 2\hat{k}) \times (\hat{i} - 3\hat{j} + \hat{k}) = \begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ 2 & -3 & 2 \\ 1 & -3 & 1 \end{vmatrix} = 3\hat{i} - 3\hat{k}$ <p>The vector equation of the plane is $\vec{r} \cdot (3\hat{i} - 3\hat{k}) = (\hat{i} + 2\hat{j} - \hat{k}) \cdot (3\hat{i} - 3\hat{k})$ or, $\vec{r} \cdot (\hat{i} - \hat{k}) = 2$ and the cartesian equation of the plane is $x - z - 2 = 0$</p>	<p>1+1/2</p> <p>1</p> <p>1/2</p> <p>1</p> <p>1</p> <p>1</p>
<u>SECTION – C</u>		
11.	<p>Evaluate: $\int_{-1}^2 x^3 - 3x^2 + 2x dx$</p> <p>Solution: The given definite integral = $\int_{-1}^2 x(x-1)(x-2) dx$</p> $= \int_{-1}^0 x(x-1)(x-2) dx + \int_0^1 x(x-1)(x-2) dx + \int_1^2 x(x-1)(x-2) dx$ $= -\int_{-1}^0 (x^3 - 3x^2 + 2x) dx + \int_0^1 (x^3 - 3x^2 + 2x) dx - \int_1^2 (x^3 - 3x^2 + 2x) dx$ $= -\left[\frac{x^4}{4} - x^3 + x^2\right]_{-1}^0 + \left[\frac{x^4}{4} - x^3 + x^2\right]_0^1 - \left[\frac{x^4}{4} - x^3 + x^2\right]_1^2$ $= \frac{9}{4} + \frac{1}{4} + \frac{1}{4} = \frac{11}{4}$	<p>1+1/2</p> <p>1/2</p> <p>2</p>

12. Using integration, find the area of the region in the first quadrant enclosed by the line $x + y = 2$, the parabola $y^2 = x$ and the x-axis.
 Solution: Solving $x + y = 2$ and $y^2 = x$ simultaneously, we get the points of intersection as $(1, 1)$ and $(4, -2)$.

1

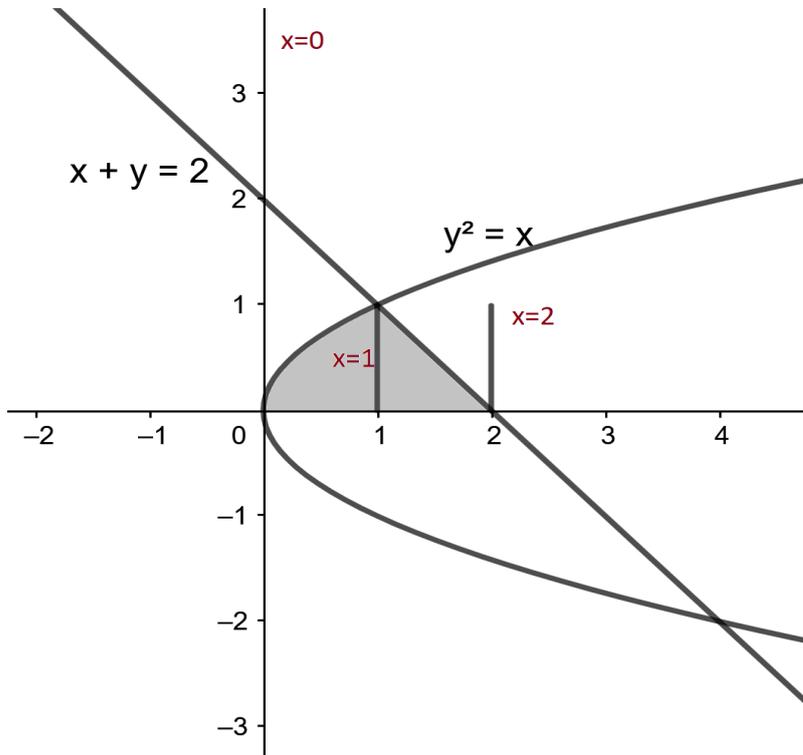


Fig 1

1

The required area = the shaded area = $\int_0^1 \sqrt{x} dx + \int_1^2 (2 - x) dx$
 $= \frac{2}{3} [x^{\frac{3}{2}}]_0^1 + [2x - \frac{x^2}{2}]_1^2$
 $= \frac{2}{3} + \frac{1}{2} = \frac{7}{6}$ square units

1

1

OR

Using integration, find the area of the region: $\{(x, y): 0 \leq y \leq \sqrt{3}x, x^2 + y^2 \leq 4\}$

Solution: Solving $y = \sqrt{3}x$ and $x^2 + y^2 = 4$, we get the points of intersection as $(1, \sqrt{3})$ and $(-1, -\sqrt{3})$

1

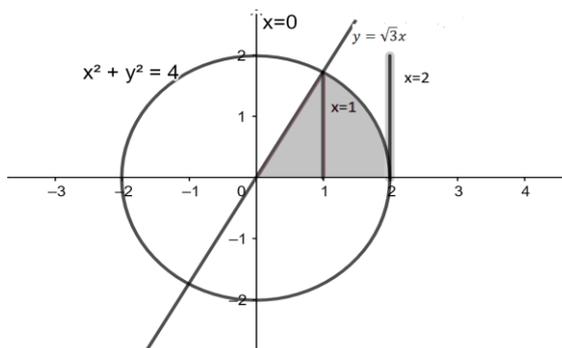


Fig 2

1

14.

CASE-BASED/DATA-BASED

Fig 3

An insurance company believes that people can be divided into two classes: those who are accident prone and those who are not. The company's statistics show that an accident-prone person will have an accident at sometime within a fixed one-year period with probability 0.6, whereas this probability is 0.2 for a person who is not accident prone. The company knows that 20 percent of the population is accident prone.

Based on the given information, answer the following questions.

(i) what is the probability that a new policyholder will have an accident within a year of purchasing a policy?

(ii) Suppose that a new policyholder has an accident within a year of purchasing a policy. What is the probability that he or she is accident prone?

Solution: Let E_1 = The policy holder is accident prone.

E_2 = The policy holder is not accident prone.

E = The new policy holder has an accident within a year of purchasing a policy.

$$(i) \quad P(E) = P(E_1) \times P(E/E_1) + P(E_2) \times P(E/E_2)$$

$$= \frac{20}{100} \times \frac{6}{10} + \frac{80}{100} \times \frac{2}{10} = \frac{7}{25}$$

1
1

$$(ii) \quad \text{By Bayes' Theorem, } P(E_1/E) = \frac{P(E_1) \times P(E/E_1)}{P(E)}$$

$$= \frac{\frac{20}{100} \times \frac{6}{10}}{\frac{7}{25}} = \frac{3}{7}$$

1

1

SAMPLE QUESTION PAPER

CLASS XII

PHYSICS THEORY

TERM II

SESSION 2021 - 22

MM : 35

TIME : 2 Hours

General Instructions:

- (i) There are 12 questions in all. All questions are compulsory.
- (ii) This question paper has three sections: Section A, Section B and Section C.
- (iii) Section A contains three questions of two marks each, Section B contains eight questions of three marks each, Section C contains one case study-based question of five marks.
- (iv) There is no overall choice. However, an internal choice has been provided in one question of two marks and two questions of three marks. You have to attempt only one of the choices in such questions.
- (v) You may use log tables if necessary but use of calculator is not allowed.

SECTION A

- Q1.** In a pure semiconductor crystal of Si, if antimony is added then what type of extrinsic semiconductor is obtained. Draw the energy band diagram of this extrinsic semiconductor so formed.
- Q2.** Consider two different hydrogen atoms. The electron in each atom is in an excited state. Is it possible for the electrons to have different energies but same orbital angular momentum according to the Bohr model? Justify your answer.

OR

Explain how does (i) photoelectric current and (ii) kinetic energy of the photoelectrons emitted in a photocell vary if the frequency of incident radiation is doubled, but keeping the intensity same? Show the graphical variation in the above two cases.

- Q3.** Name the device which converts the change in intensity of illumination to change in electric current flowing through it. Plot I-V characteristics of this device for different intensities. State any two applications of this device.

SECTION B

- Q4.** Derive an expression for the frequency of radiation emitted when a hydrogen atom de-excites from level n to level $(n - 1)$. Also show that for large values of n , this frequency equals to classical frequency of revolution of an electron.
- Q5.** Explain with a proper diagram how an ac signal can be converted into dc (pulsating) signal with output frequency as double than the input frequency using pn junction diode. Give its input and output waveforms.
- Q6.** How long can an electric lamp of 100 W be kept glowing by fusion of 2 kg of deuterium? Take the fusion reaction as
- $${}^2_1\text{H} + {}^2_1\text{H} \rightarrow {}^3_2\text{He} + n + 3.27 \text{ MeV}$$
- Q7.** Define wavefront. Draw the shape of refracted wavefront when the plane incident wave undergoes refraction from optically denser medium to rarer medium. Hence prove Snell's law of refraction.

- Q8.** (a) Draw a ray diagram of compound microscope for the final image formed at least distance of distinct vision?
- (b) An angular magnification of 30X is desired using an objective of focal length 1.25 cm and an eye piece of focal length 5 cm. How will you set up the compound microscope for the final image formed at least distance of distinct vision?

OR

- (a) Draw a ray diagram of Astronomical Telescope for the final image formed at infinity.
- (b) A small telescope has an objective lens of focal length 140 cm and an eyepiece of focal length 5.0 cm. Find the magnifying power of the telescope for viewing distant objects when
- (i) the telescope is in normal adjustment,
- (ii) the final image is formed at the least distance of distinct vision.
- Q9.** Light of wavelength 2000 \AA falls on a metal surface of work function 4.2 eV.
- (a) What is the kinetic energy (in eV) of the fastest electrons emitted from the surface?
- (b) What will be the change in the energy of the emitted electrons if the intensity of light with same wavelength is doubled?
- (c) If the same light falls on another surface of work function 6.5 eV, what will be the energy of emitted electrons?

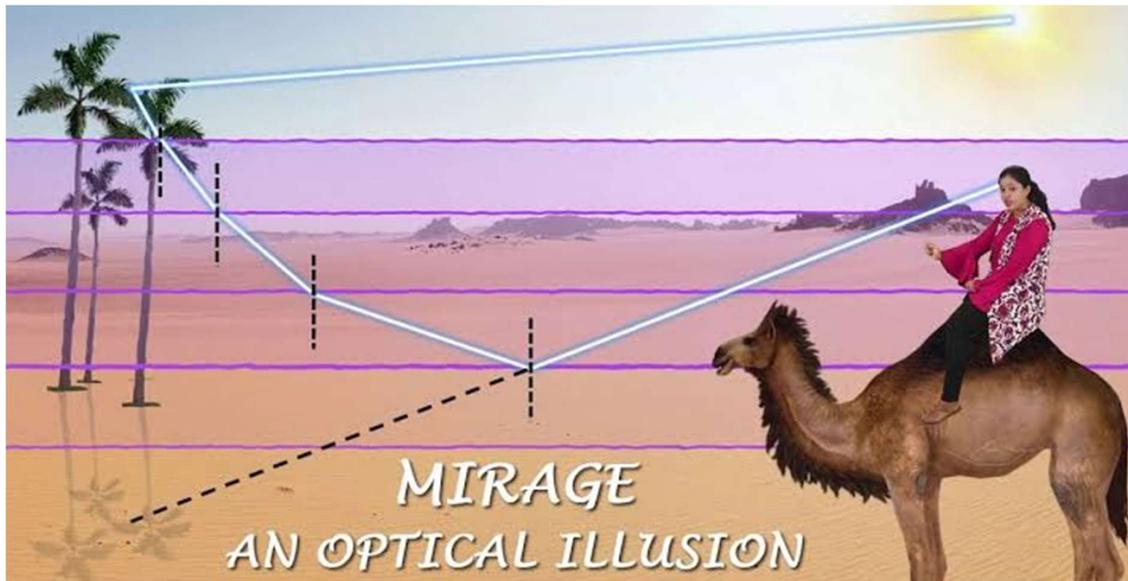
- Q10.** The focal length of a convex lens made of glass of refractive index (1.5) is 20 cm. What will be its new focal length when placed in a medium of refractive index 1.25 ? Is focal length positive or negative? What does it signify?

- Q11.** (a) Name the e.m. waves which are suitable for radar systems used in aircraft navigation. Write the range of frequency of these waves.
- (b) If the Earth did not have atmosphere, would its average surface temperature be higher or lower than what it is now? Explain.
- (c) An e.m. wave exerts pressure on the surface on which it is incident. Justify.

OR

- (a) "If the slits in Young's double slit experiment are identical, then intensity at any point on the screen may vary between zero and four times to the intensity due to single slit". Justify the above statement through a relevant mathematical expression.
- (b) Draw the intensity distribution as function of phase angle when diffraction of light takes place through coherently illuminated single slit.

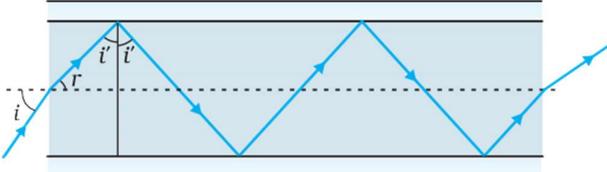
- Q12. CASE STUDY: MIRAGE IN DESERTS**



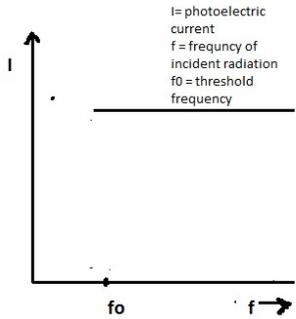
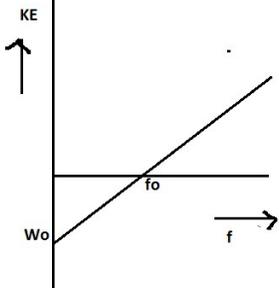
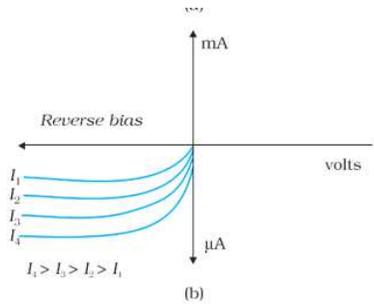
To a distant observer, the light appears to be coming from somewhere below the ground. The observer naturally assumes that light is being reflected from the ground, say, by a pool of water near the tall object.

Such inverted images of distant tall objects cause an optical illusion to the observer. This phenomenon is called mirage. This type of mirage is especially common in hot deserts.

Based on the above facts, answer the following questions:

(a)	Which of the following phenomena is prominently involved in the formation of mirage in deserts? (i) Refraction, Total internal Reflection (ii) Dispersion and Refraction (iii) Dispersion and scattering of light (iv) Total internal Reflection and diffraction.	1
(b)	A diver at a depth 12 m inside water ($a_{\mu_w} = \frac{4}{3}$) sees the sky in a cone of semi- vertical angle (i) $\sin^{-1} \frac{4}{3}$ (ii) $\tan^{-1} \frac{4}{3}$ (iii) $\sin^{-1} \frac{3}{4}$ (iv) 90°	1
(c)	In an optical fibre, if n_1 and n_2 are the refractive indices of the core and cladding, then which among the following, would be a correct equation? (i) $n_1 < n_2$ (ii) $n_1 = n_2$ (iii) $n_1 \ll n_2$ (iv) $n_1 > n_2$	1
(d)	A diamond is immersed in such a liquid which has its refractive index with respect to air as greater than the refractive index of water with respect to air. Then the critical angle of diamond-liquid interface as compared to critical angle of diamond -water interface will (i) depend on the nature of the liquid only (ii) decrease (iii) remain the same (iv) increase.	1
(e)	The following figure shows a cross-section of a 'light pipe' made of a glass fiber of refractive index 1.68. The outer covering of the pipe is made of a material of refractive index 1.44. What is the range of the angles of the incident rays with the axis of the pipe for the following phenomena to occur. 	1

	(i) $0 < i < 90^\circ$	(ii) $0 < i < 60^\circ$
	(iii) $0 < i < 45^\circ$	(iv) $0 < i < 30^\circ$

	<p>increased energy cannot eject more than one electron from the metal surface.</p>	<p>mark</p>
	 <p> I = photoelectric current f = frequency of incident radiation f_0 = threshold frequency </p>	<p>1/2 mark</p>
<p>(ii)</p>	<p>The kinetic energy of the photoelectron becomes more than the double of its original energy. As the work function of the metal is fixed, so incident photon of higher frequency and hence higher energy will impart more energy to the photoelectrons.</p>	<p>1/2 mark</p>
	 <p> KE W_0 f_0 f </p>	<p>1/2 mark</p>
<p>ANS 3</p>	<p>Photodiodes are used to detect optical signals of different intensities by changing current flowing through them.</p>	<p>1/2 mark</p>
	 <p> I_1 I_2 I_3 I_4 $I_1 > I_2 > I_3 > I_4$ (b) </p> <p>I-V Characteristics of a photodiode</p>	<p>1/2 mark</p>

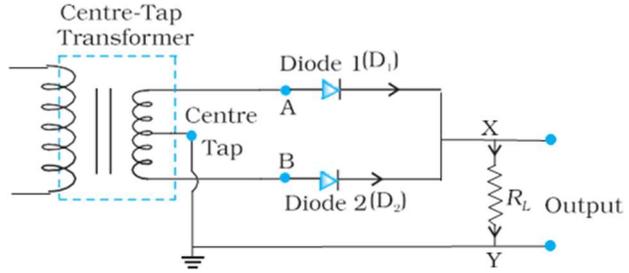
	<p>Applications of photodiodes:</p> <ol style="list-style-type: none"> 1. In detection of optical signals. 2. In demodulation of optical signals. 3. In light operated switches. 4. In speed reading of computer punched cards. 5. In electronic counters <p>(any two out of these or any other relevant application)</p>	<p>(1/2) X 2= 1 mark</p>
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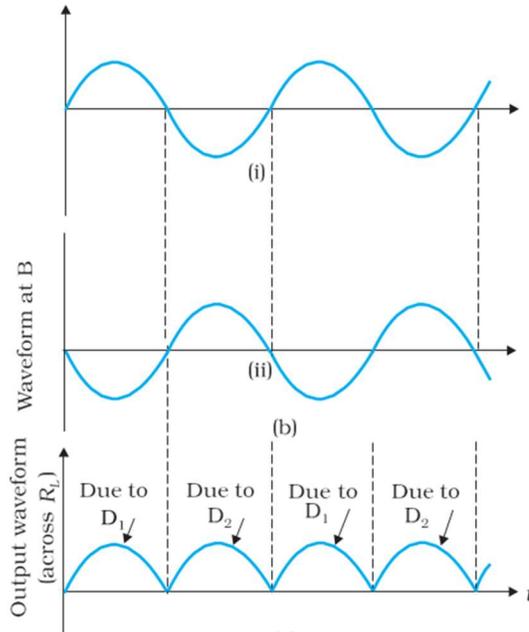
SECTION B

ANS 4	<p>From Bohr's theory, the frequency f of the radiation emitted when an electron de – excites from level n_2 to level n_1 is given as</p> $f = \frac{2\pi^2mk^2z^2e^4}{h^3} \left[\frac{1}{n_1^2} - \frac{1}{n_2^2} \right]$ <p>Given $n_1 = n - 1$, $n_2 = n$, derivation of it</p> $f = \frac{2\pi^2mk^2z^2e^4}{h^3} \frac{(2n - 1)}{(n - 1)^2n^2}$	<p>2 marks</p>
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	<p>For large n, $2n - 1 = 2n$, $n - 1 = n$ and $z = 1$</p> <p>Thus, $f = \frac{4\pi^2mk^2e^4}{n^3h^3}$</p> <p>which is same as orbital frequency of electron in n^{th} orbit.</p> $f = \frac{v}{2\pi r} = \frac{4\pi^2mk^2e^4}{n^3h^3}$	<p>1 mark</p>
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ANS 5	<p>A junction diode allows current to pass only when it is forward biased. So, if an alternating voltage is applied across a diode the current flows only in that part of the cycle when the diode is forward biased. This property is used to rectify alternating voltages and the circuit used for this purpose is called a rectifier.</p>	<p>1 mark</p>
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	 <p style="text-align: center;">Circuit Diagram</p>	<p>1 mark</p>
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1 mark

Working with input and output waveforms

ANS 6

Number of atoms present in 2 g of deuterium = 6×10^{23}
 Number of atoms present in 2.0 Kg of deuterium = 6×10^{26}
 Energy released in fusion of 2 deuterium atoms

$$= 3.27 \text{ MeV}$$

Energy released in fusion of 2.0 Kg of deuterium atoms

$$= \frac{3.27}{2} \times 6 \times 10^{26} \text{ MeV}$$

$$= 9.81 \times 10^{26} \text{ MeV}$$

$$= 15.696 \times 10^{13} \text{ J}$$

Energy consumed by bulb per sec = 100 J

$$\text{Time for which bulb will glow} = \frac{15.696 \times 10^{13}}{100} \text{ s} = 4.97 \times 10^4 \text{ year}$$

1 mark

1 mark

1 mark

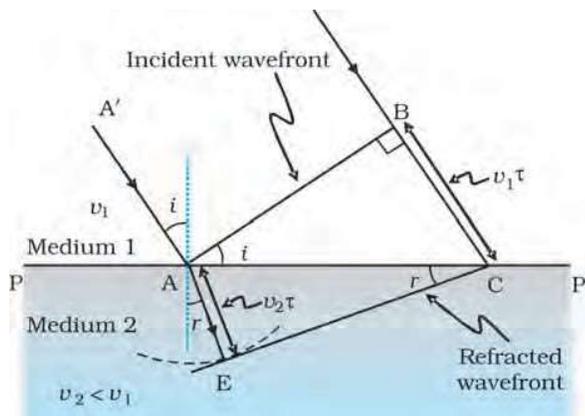
ANS 7

A locus of points, which oscillate in phase is called a wavefront.

OR

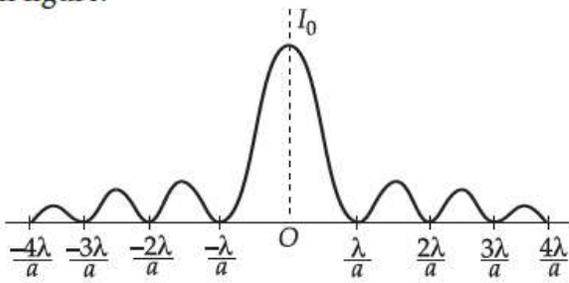
A wavefront is defined as a surface of constant phase.

1 mark



1 mark

(b)	<p>(i) In normal adjustment : Magnifying power. $m = f_o/f_e = (140/5) = 28$</p> <p>(ii) When the final image is formed at the least distance of distinct vision (25 cm) :</p> $m = \frac{f_o}{f_e} \left(1 + \frac{f_e}{D}\right) = (28 \times 1.2) = \mathbf{33.6}$	<p>½ mark</p> <p>1 mark</p>
ANS 9	<p>$\lambda = 2000 \text{ \AA} = (2000 \times 10^{-10})\text{m}$ $W_o = 4.2\text{eV}$ $h = 6.63 \times 10^{-34}\text{JS}$</p> <p>(a) Using Einstein's photoelectric equation K. E. = (6.2 - 4.2) eV = 2.0 eV</p> <p>(b) The energy of the emitted electrons does not depend upon intensity of incident light; hence the energy remains unchanged.</p> <p>(c) For this surface, electrons will not be emitted as the energy of incident light (6.2 eV) is less than the work function (6.5 eV) of the surface.</p>	<p>1 mark</p> <p>1 mark</p> <p>1 mark</p>
ANS 10	<p>Given $a_{\mu_g} = 1.5$ Focal length of the given convex lens when it is placed in air is $f = +20 \text{ cm}$ Refractive index of the given medium with respect to air is $a_{\mu_m} = 1.25$ New focal length of the given convex lens when placed in a medium is f'</p> $\frac{1}{f} = (a_{\mu_g} - 1) \left[\left(\frac{1}{R_1} \right) + \left(\frac{1}{R_2} \right) \right] \text{ -----(A)}$ $\frac{1}{f'} = (m_{\mu_g} - 1) \left[\left(\frac{1}{R_1} \right) + \left(\frac{1}{R_2} \right) \right] \text{ -----(B)}$ <p>Dividing (A) by (B), we get</p> $\frac{f'}{f} = \frac{(a_{\mu_g} - 1)}{(m_{\mu_g} - 1)} = \frac{(1.5 - 1)}{(1.2 - 1)} = \frac{0.5}{0.2} = \frac{5}{2} = 2.5$ <p>$f' = 2.5f = (2.5 \times 20)\text{cm} = +50\text{cm}$ as $m_{\mu_g} = \frac{\mu_g}{\mu_m} = \frac{1.5}{1.25} = 1.2$</p> <p>New focal length is positive. The significance of the positive sign of the focal length is that given convex lens is still converging in the given medium.</p>	<p>1/2 mark</p> <p>1/2 mark</p> <p>1 mark</p> <p>1/2 mark</p> <p>1/2 mark</p>
ANS 11. (a)	Microwaves are suitable for the radar system used in aircraft	

	<p>navigation. Range of frequency of microwaves is 108 Hz to 1011 Hz.</p> <p>(b) If the Earth did not have atmosphere, then there would be absence of greenhouse effect of the atmosphere. Due to this reason, the temperature of the earth would be lower than what it is now.</p> <p>(c) An e.m. wave carries momentum with itself and given by $P = \text{Energy of wave}(U) / \text{Speed of the wave}(c)$ $= U/c$ when it is incident upon a surface it exerts pressure on it.</p>	<p>1 mark</p> <p>1 mark</p> <p>1 mark</p>
OR		
<p>ANS. 11 (a)</p>	<p>The total intensity at a point where the phase difference is ϕ, is given by $I = I_1 + I_2 + 2\sqrt{I_1 I_2} \cos \phi$. Here I_1 and I_2 are the intensities of two individual sources which are equal. When ϕ is 0, $I = 4I_1$. When ϕ is 90°, $I = 0$ Thus intensity on the screen varies between $4I_1$ and 0.</p>	<p>2 marks</p>
<p>ANS. 11 (b)</p>	<p>Intensity distribution as function of phase angle, when diffraction of light takes place through coherently illuminated single slit</p> <p>The intensity pattern on the screen is shown in the given figure.</p>  <p style="text-align: center;">Width of central maximum $= \frac{2D\lambda}{a}$,</p>	<p>1 mark</p>
<p>ANS 12. (a)</p>	<p>Ans (i) Refraction, Total internal reflection</p>	<p>1 mark</p>
<p>(b)</p>	<p>Ans iii) $\sin^{-1}\left(\frac{3}{4}\right)$ $a_{\mu\omega} = \frac{1}{\sin C}$ $\Rightarrow \sin C = \frac{1}{a_{\mu\omega}} \Rightarrow C = \sin^{-1}\left(\frac{1}{a_{\mu\omega}}\right)$</p>	<p>1 mark</p>

(c)	<p>Ans (iv) $n_1 > n_2$</p> <p>The refractive index of the core should be greater than the refractive index of the cladding.</p>	1 mark
(d)	<p>Ans (iv) increases</p> $1_{\mu_d} = \frac{1}{\sin C} = \frac{\mu_d}{\mu_1}, \omega_{\mu_d} = \frac{1}{\sin C'} = \frac{\mu_d}{\mu_\omega}$	1 mark
(e)	<p>$\mu_1 > \mu_\omega$ Thus $C > C'$</p> <p>Ans (ii) $0 < i < 60^\circ, 1_{\mu_2} = \frac{1}{\sin C'}$</p> $\sin C' = \frac{1.44}{1.68} = 0.8571$ $\Rightarrow C' = 59^\circ$ <p>Total internal reflection will occur if the angle $i' > i'_c$, i.e., if $i' > 59^\circ$ or when $r < r_{\max}$ where $r_{\max} = 90^\circ - 59^\circ = 31^\circ$. Using Snell's law,</p> $\frac{\sin i_{\max}}{\sin r_{\max}} = 1.68$ <p>or $\sin i_{\max} = 1.68 \times \sin r_{\max}$ $= 1.68 \times \sin 31^\circ = 1.68 \times 0.5150 = 0.8662$</p> <p>$\therefore i_{\max} = 60^\circ$ Thus all incident rays which make angles in the range $0 < i < 60^\circ$ with the axis of the pipe will suffer total internal reflections in the pipe.</p>	1 mark

SAMPLE PAPER QUESTION (2021-22)

TERM – II

CHEMISTRY THEORY (043)

MM:35

Time: 2 Hours

GENERAL INSTRUCTIONS:

Read the following instructions carefully.

1. There are **12** questions in this question paper with internal choice.
2. **SECTION A - Q. No. 1 to 3** are very short answer questions carrying 2 marks each.
3. **SECTION B - Q. No. 4 to 11** are short answer questions carrying 3 marks each.
4. **SECTION C- Q. No. 12** is case based question carrying 5 marks.
5. **All questions are compulsory.**
6. **Use of log tables and calculators is not allowed**

SECTION A

1. Arrange the following in the increasing order of their property indicated (any 2):
 - a. Benzoic acid, Phenol, Picric acid, Salicylic acid (pka values).
 - b. Acetaldehyde, Acetone, Methyl tert butyl ketone (reactivity towards NH_2OH).
 - c. ethanol, ethanoic acid, benzoic acid (boiling point) (1x2=2)
2. Solutions of two electrolytes 'A' and 'B' are diluted. The Λ_m of 'B' increases 1.5 times while that of A increases 25 times. Which of the two is a strong electrolyte? Justify your answer. Graphically show the behavior of 'A' and 'B'. (2)
3. Give reasons to support the answer:
 - a. Presence of Alpha hydrogen in aldehydes and ketones is essential for aldol condensation.
 - b. 3-Hydroxy pentan-2-one shows positive Tollen's test. (1x2=2)

SECTION B

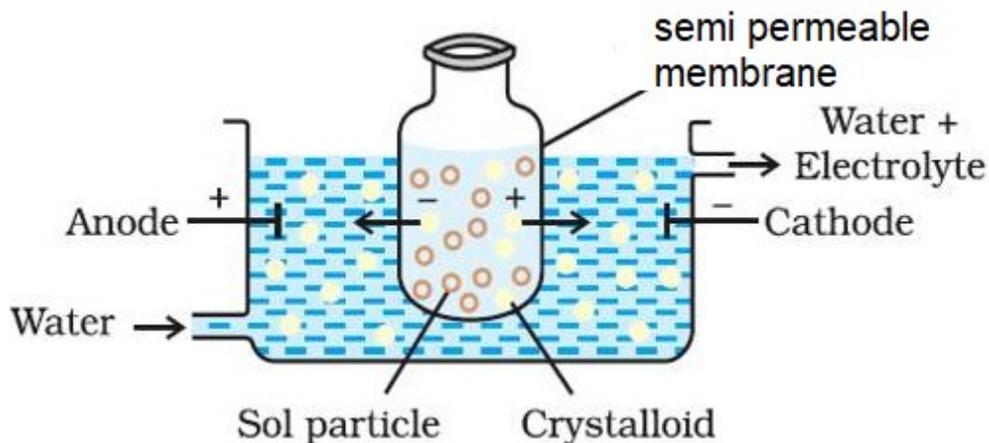
4. Account for the following:
 - a. Aniline cannot be prepared by the ammonolysis of chlorobenzene under normal conditions.
 - b. N-ethylethanamine boils at 329.3K and butanamine boils at 350.8K, although both are isomeric in nature.
 - c. Acylation of aniline is carried out in the presence of pyridine. (1x3=3)

OR

4. Convert the following:
- Phenol to N-phenylethanamide.
 - Chloroethane to methanamine.
 - Propanenitrile to ethanol. (1x3=3)
5. Answer the following questions:
- $[\text{Ni}(\text{H}_2\text{O})_6]^{2+}$ (aq) is green in colour whereas $[\text{Ni}(\text{H}_2\text{O})_4(\text{en})]^{2+}$ (aq) is blue in colour, give reason in support of your answer.
 - Write the formula and hybridization of the following compound:
tris(ethane-1,2-diamine) cobalt(III) sulphate (1+2)

OR

5. In a coordination entity, the electronic configuration of the central metal ion is $t_2g^3 e_g^1$
- Is the coordination compound a high spin or low spin complex?
 - Draw the crystal field splitting diagram for the above complex. (1+2)
6. Account for the following:
- Ti(IV) is more stable than the Ti (II) or Ti(III).
 - In case of transition elements, ions of the same charge in a given series show progressive decrease in radius with increasing atomic number.
 - Zinc is a comparatively a soft metal, iron and chromium are typically hard. (1x3=3)
7. An alkene 'A' (Mol. formula C_5H_{10}) on ozonolysis gives a mixture of two compounds 'B' and 'C'. Compound 'B' gives positive Fehling's test and also forms iodoform on treatment with I_2 and NaOH . Compound 'C' does not give Fehling's test but forms iodoform. Identify the compounds A, B and C. Write the reaction for ozonolysis and formation of iodoform from B and C. (3)
8. Observe the figure given below and answer the questions that follow:



- Which process is represented in the figure?

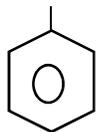
- b. What is the application of this process?
- c. Can the same process occur without applying electric field? Why is the electric field applied?

9. What happens when reactions:

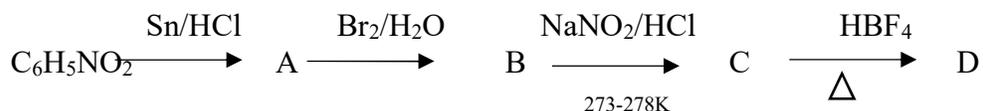
- a. N-ethylethanamine reacts with benzenesulphonyl chloride.
- b. Benzylchloride is treated with ammonia followed by the reaction with Chloromethane.
- c. Aniline reacts with chloroform in the presence of alcoholic potassium hydroxide. (1x3=3)

OR

9. a. Write the IUPAC name for the following organic compound:

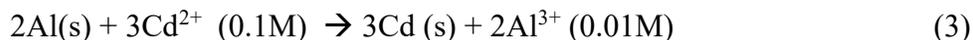


b. Complete the following:



(1x3=3)

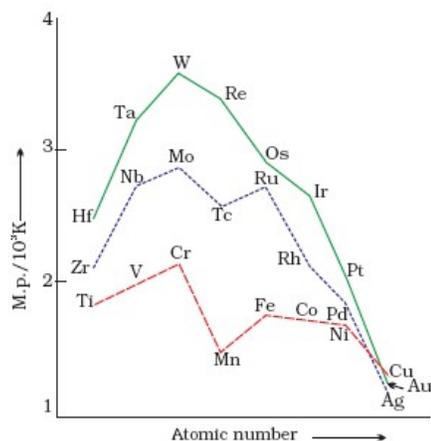
10. Represent the cell in which the following reaction takes place. The value of E° for the cell is 1.260 V. What is the value of E_{cell} ?



11. a. Why are fluorides of transition metals more stable in their higher oxidation state as compared to the lower oxidation state?
- b. Which one of the following would feel attraction when placed in magnetic field: Co^{2+} , Ag^+ , Ti^{4+} , Zn^{2+}
- c. It has been observed that first ionization energy of 5 d series of transition elements are higher than that of 3d and 4d series, explain why? (1x3=3)

OR

11. On the basis of the figure given below, answer the following questions:



(source: NCERT)

- Why Manganese has lower melting point than Chromium?
- Why do transition metals of 3d series have lower melting points as compared to 4d series?
- In the third transition series, identify and name the metal with the highest melting point.

(1x3=3)

SECTION C

12. Read the passage given below and answer the questions that follow.

Are there nuclear reactions going on in our bodies?

There are nuclear reactions constantly occurring in our bodies, but there are very few of them compared to the chemical reactions, and they do not affect our bodies much. All of the physical processes that take place to keep a human body running are chemical processes. Nuclear reactions can lead to chemical damage, which the body may notice and try to fix.

The nuclear reaction occurring in our bodies is radioactive decay. This is the change of a less stable nucleus to a more stable nucleus. Every atom has either a stable nucleus or an unstable nucleus, depending on how big it is and on the ratio of protons to neutrons. The ratio of neutrons to protons in a stable nucleus is thus **around 1:1** for small nuclei ($Z < 20$). Nuclei with too many neutrons, too few neutrons, or that are simply too big are unstable. They eventually transform to a stable form through radioactive decay. Wherever there are atoms with unstable nuclei (radioactive atoms), there are nuclear reactions occurring naturally. The interesting thing is that there are small amounts of radioactive atoms everywhere: in your chair, in the ground, in the food you eat, and yes, in your body.

The most common natural radioactive isotopes in humans are carbon-14 and potassium-40. Chemically, these isotopes behave exactly like stable carbon and potassium. For this reason, the body uses carbon-14 and potassium-40 just like it does normal carbon and potassium; building them into the different parts of the cells, without knowing that they are radioactive. In time,

carbon-14 atoms decay to stable nitrogen atoms and potassium-40 atoms decay to stable calcium atoms. Chemicals in the body that relied on having a carbon-14 atom or potassium-40 atom in a certain spot will suddenly have a nitrogen or calcium atom. Such a change damages the chemical. Normally, such changes are so rare, that the body can repair the damage or filter away the damaged chemicals.

The natural occurrence of carbon-14 decay in the body is the core principle behind carbon dating. As long as a person is alive and still eating, every carbon-14 atom that decays into a nitrogen atom is replaced on average with a new carbon-14 atom. But once a person dies, he stops replacing the decaying carbon-14 atoms. Slowly the carbon-14 atoms decay to nitrogen without being replaced, so that there is less and less carbon-14 in a dead body. The rate at which carbon-14 decays is constant and follows first order kinetics. It has a half - life of nearly 6000 years, so by measuring the relative amount of carbon-14 in a bone, archeologists can calculate when the person died. All living organisms consume carbon, so carbon dating can be used to date any living organism, and any object made from a living organism. Bones, wood, leather, and even paper can be accurately dated, as long as they first existed within the last 60,000 years. This is all because of the fact that nuclear reactions naturally occur in living organisms.

(source: The textbook Chemistry: The Practical Science by Paul B. Kelter, Michael D. Mosher and Andrew Scott states)

- a. Why is Carbon -14 radioactive while Carbon -12 not? (Atomic number of Carbon: 6)
- b. Researchers have uncovered the youngest known dinosaur bone, dating around 65 million years ago. How was the age of this fossil estimated?
- c. Which are the two most common radioactive decays happening in human body?
- d. Suppose an organism has 20 g of Carbon -14 at its time of death. Approximately how much Carbon -14 remains after 10,320 years? (Given $\text{antilog } 0.517 = 3.289$)

OR

- d. Approximately how old is a fossil with 12 g of Carbon -14 if it initially possessed 32 g of Carbon -14? (Given $\log 2.667 = 0.4260$)
(1+1+1+2)

MARKING SCHEME (2021-22)

TERM – II

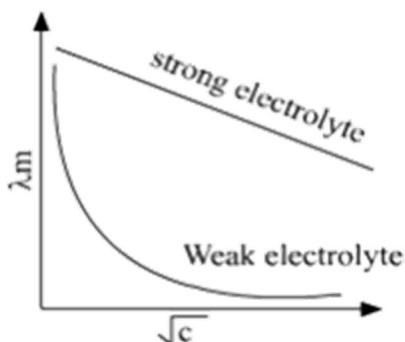
CHEMISTRY THEORY (043)

MM:35

Time: 2 Hours

1. (a) Picric acid < salicylic acid < benzoic acid < phenol 1
- (b) Methyl tert – butyl ketone < acetone < Acetaldehyde 1
- (c) ethanol < ethanoic acid < benzoic acid (boiling point of carboxylic acids is higher than alcohols due to extensive hydrogen bonding, boiling point increases with increase in molar mass) 1

2. B is a strong electrolyte. The molar conductivity increases slowly with dilution as there is no increase in number of ions on dilution as strong electrolytes are completely dissociated. $\frac{1}{2} + \frac{1}{2}$



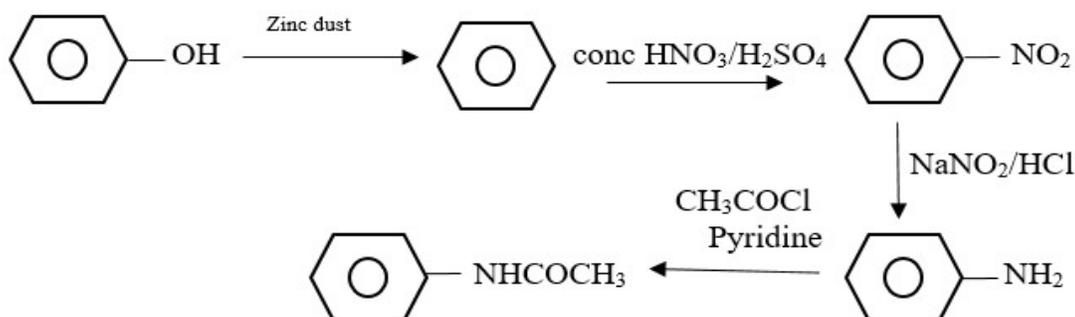
3. (a) The alpha hydrogen atoms are acidic in nature due to presence of electron withdrawing carbonyl group. These can be easily removed by a base and the carbanion formed is resonance stabilized. 1
- (b) Tollen's reagent is a weak oxidizing agent not capable of breaking the C-C bond in ketones. Thus ketones cannot be oxidized using Tollen's reagent itself gets reduced to Ag. 1
4. a) In case of chlorobenzene, the C—Cl bond is quite difficult to break as it acquires a partial double bond character due to conjugation. 1
So Under the normal conditions, ammonolysis of chlorobenzene does not yield aniline.
- b) Primary and secondary amines are engaged in intermolecular association due to hydrogen bonding between nitrogen of one and hydrogen of another molecule. Due to the presence of three hydrogen atoms, the intermolecular association is more in 1

primary amines than in secondary amines as there are two hydrogen atoms available for hydrogen bond formation in it.

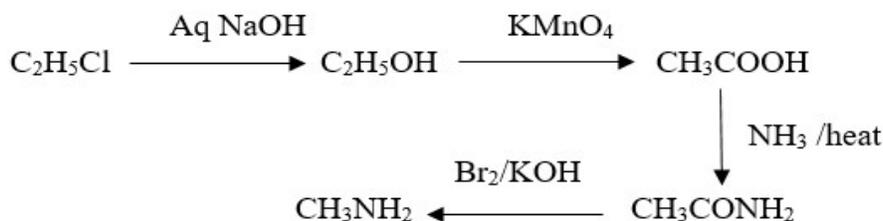
c) During the acylation of aniline, stronger base pyridine is added. This done in order to remove the HCl so formed during the reaction and to shift the equilibrium to the right hand side.

OR

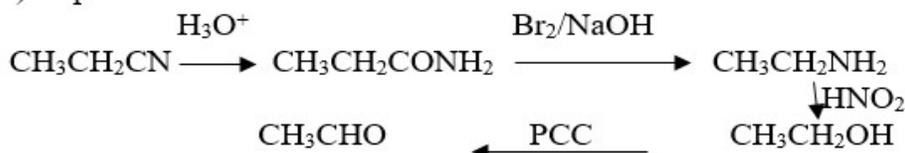
a) Phenol into N-phenylethanamide



b) Chloroethane to methanamine



c) Propanenitrile to ethanal



5 (a) The colour of coordination compound depends upon the type of ligand and d-d transition taking place .

H_2O is weak field ligand , which causes small splitting , leading to the d-d transition corresponding green colour , however due to the presence of (en) which is a strong field ligand , the splitting is increased . Due to the change in t_{2g} - e_g splitting the colouration of the compound changes from green to blue.

(b) Formula of the compound is $[\text{Co}(\text{H}_2\text{NCH}_2\text{CH}_2\text{NH}_2)_3]_2(\text{SO}_4)_3$

The hybridisation of the compound is: d^2sp^3

OR

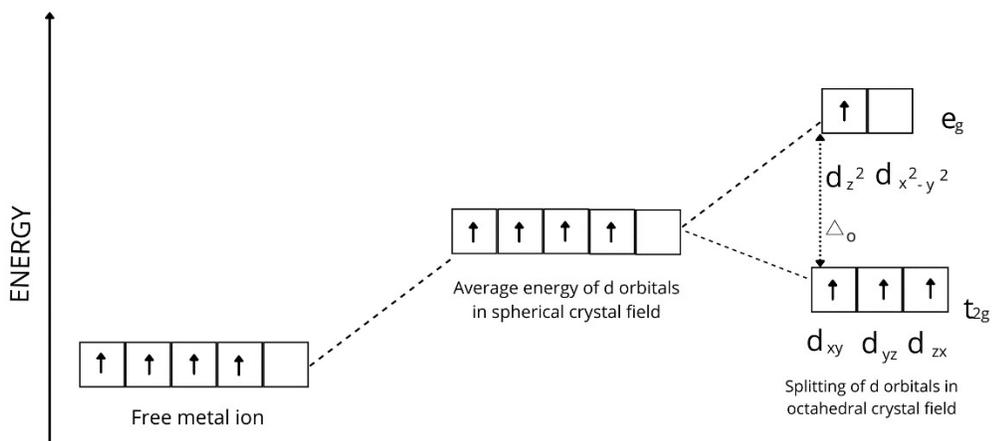
1

a) As the fourth electron enters one of the e_g orbitals giving the configuration $t_{2g}^3 e_g^1$, which indicates $\Delta_o < P$ hence forms high spin complex.

1

b)

2



6 (a) Ti is having electronic configuration $[Ar] 3d^2 4s^2$. Ti (IV) is more stable as Ti^{4+} acquires nearest noble gas configuration on loss of 4 e-.

1

(b) In case of transition elements, ions of the same charge in a given series show progressive decrease in radius with increasing atomic number.

1

As the new electron enters a d orbital each time the nuclear charge increases by unity. The shielding effect of a d electron is not that effective, hence the net electrostatic attraction between the nuclear charge and the outermost electron increases and the ionic radius decreases.

(c) Iron and Chromium are having high enthalpy of atomization due to the presence of unpaired electrons, which accounts for their hardness. However, Zinc has low enthalpy of atomization as it has no unpaired electron. Hence zinc is comparatively a soft metal.

1

7 Compound A is an alkene, on ozonolysis it will give carbonyl compounds. As both B and C have $>C=O$ group,

B gives positive Fehling's test so it is an aldehyde and it gives iodoform test so it is so it has $CH_3C=O$ group. This means the aldehyde is acetaldehyde

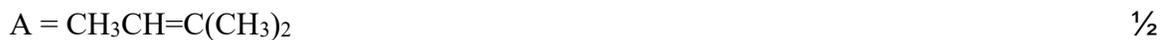
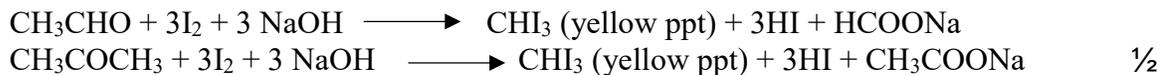
C does not give Fehling's test, so it is a ketone. It gives positive iodoform test so it is a methyl ketone means it has $CH_3C=O$ group

Compound A (C_5H_{10}) on ozonolysis gives B (CH_3CHO) + C (CH_3COR)

So "C" is CH_3COCH_3

$CH_3CH=C(CH_3)_2$ (i) O_3 (ii) Zn/H_3O^+ \longrightarrow $CH_3CHO + CH_3COCH_3$

$\frac{1}{2}$

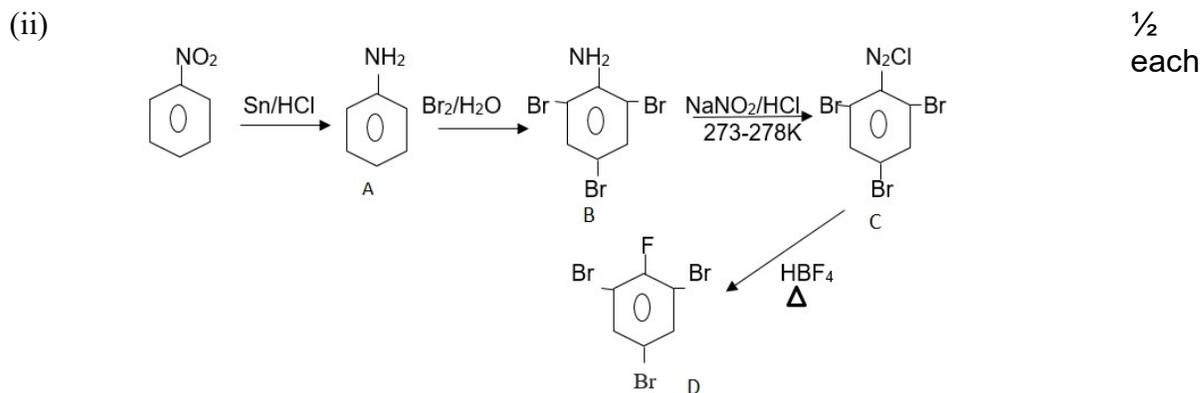


- 8 (a) electro dialysis 1
 (b) purification of colloidal solution 1
 (c) Yes. Dialysis is a very slow process to increase its speed electric field is applied 1/2+1/2

- 9 (a) When N-ethylethanamine reacts with benzenesulphonyl chloride, N,N-diethylbenzenesulphonamide is formed. 1
 (b) When benzylchloride is treated with ammonia, Benzylamine is formed which on reaction with Chloromethane yields a secondary amine, N-methylbenzylamine. 1/2+1/2
 (c) When aniline reacts with chloroform in the presence of alcoholic potassium hydroxide, **phenyl isocyanides or phenyl isonitrile** is formed. 1

OR

- (i) N-Ethyl-N-methylbenzenamine or N-Ethyl-N-ethylaniline 1



- 10 $\text{Al(s) / Cd}^{2+} (0.1\text{M}) // \text{Al}^{3+} (0.01\text{M}) / \text{Cd(s)}$ 1/2
 $2\text{Al(s)} + 3\text{Cd}^{2+} (0.1\text{M}) \rightarrow 3\text{Cd (s)} + 2\text{Al}^{3+} (0.01\text{M})$

$$E_{\text{cell}} = E^{\circ}_{\text{cell}} - \frac{0.059}{n} \log \frac{[\text{Al}^{3+}]^2}{[\text{Cd}^{2+}]^3}$$
 1/2

$$E_{\text{cell}} = 1.26 - \frac{0.059}{6} \log \frac{(0.01)^2}{(0.1)^3}$$
 1/2

	$= 1.26 - \frac{0.059}{6}(-1)$	1
	$= 1.26 + 0.009$	$\frac{1}{2}$
	$= 1.269 \text{ V}$	ans unit
11	(a) The ability of fluorine to stabilize the highest oxidation state is attributed to the higher lattice energy or high bond enthalpy.	1 1
	(b) Co^{2+} has three unpaired electrons so it would be paramagnetic in nature, hence Co^{2+} ion would be attracted to magnetic field.	
	(c) The transition elements of 5d series have intervening 4f orbitals. There is greater effective nuclear charge acting on outer valence electrons due to the weak shielding by 4f electrons. Hence first ionisation energy of 5 d series of transition elements are higher than that of 3d and 4d series.	1
	OR	1
	a) Manganese is having lower melting point as compared to chromium, as it has highest number of unpaired electrons, strong interatomic metal bonding, hence no delocalisation of electrons.	
	b) There is much more frequent metal – metal bonding in compounds of the heavy transition metals i.e 4d and 5d series, which accounts for lower melting point of 3d series.	1 1
	c) Tungsten	
12	(a) Ratio of neutrons to protons is 2.3: 1 which is not the stable ratio of 1:1	1
	(b) Age of fossils can be estimated by C-14 decay. All living organisms have C-14 which decays without being replaced back once the organism dies.	1
	(c) carbon-14 atoms decay to stable nitrogen atoms and potassium-40 atoms decay to stable calcium	1
	(d) $t = 2.303 / k \log (C_0/C_t)$	$\frac{1}{2}$
	$C_0 = 20 \text{ g}$ $C_t = ?$	
	$t = 10320 \text{ years}$ $k = 0.693/6000$ (half-life given in passage)	
	substituting in equation:	
	$10320 = 2.303 / (0.693/6000) \log 20 / C_t$	$\frac{1}{2}$
	$0.517 = \log 20 / C_t$ $\text{antilog}(0.517) = 20/C_t$	
	$3.289 = 20/C_t$	$\frac{1}{2}$
	$C_t = 6.17 \text{ g}$	$\frac{1}{2}$
	OR	
	$t = 2.303 / k \log (C_0/C_t)$	$\frac{1}{2}$
	$C_0 = 32 \text{ g}$ $C_t = 12$	
	$t = ?$ $k = 0.693/6000$ (half life given in passage)	
	substituting in equation:	
	$t = 2.303 / (0.693/6000) \log 32 / 12$	$\frac{1}{2}$
	$t = 2.303 \times 60000 / 0.693 \log 2.667$	$\frac{1}{2}$
	$t = 2.303 \times 60000 \times 0.4260 / 0.693$	

= 8494 years

$\frac{1}{2}$

SAMPLE QUESTION PAPER

CLASS XII

BIOLOGY (044)

TERM II (2021-22)

Max. Marks 35

Time allowed: 2 hours

General Instructions:

- All questions are compulsory.
- The question paper has three sections and 13 questions. All questions are compulsory.
- Section–A has 6 questions of 2 marks each; Section–B has 6 questions of 3 marks each; and Section–C has a case-based question of 5 marks.
- There is no overall choice. However, internal choices have been provided in some questions. A student has to attempt only one of the alternatives in such questions.
- Wherever necessary, neat and properly labeled diagrams should be drawn.

Q. No.		Marks
Section A		
1	Humans have innate immunity for protection against pathogens that may enter the gut along with food. What are the two barriers that protect the body from such pathogens?	2
2	<p>A patient admitted in ICU was diagnosed to have suffered from myocardial infarction. The condition of coronary artery is depicted in the image below.</p> <p>Name two bioactive agents and their mode of action that can improve this condition.</p>  <p>OR</p> <p>Substantiate by giving two reasons as to why a holistic understanding of the flora and fauna the cropland is required before introducing an appropriate biocontrol method.</p>	2

<p>3</p>	<p>Identify the compound chemical structure is shown below. State any three of its physical properties.</p> <div data-bbox="483 239 946 562" data-label="Chemical-Block"> <p>The chemical structure shows a complex polycyclic alkaloid. It features a central benzene ring fused to several other rings, including a five-membered ring containing an oxygen atom and a six-membered ring containing a nitrogen atom substituted with a methyl group (CH₃). Two hydroxyl groups (HO) are attached to the structure: one is on a ring with a double bond, and the other is on a ring with a double bond and a hydrogen atom shown with a wedge bond.</p> </div>	<p>2</p>
<p>4</p>	<p>Water samples were collected at points A, B and C in a segment of a river near a sugar factory and tested for BOD level. The BOD levels of samples A, B and C were 400 mg/L, 480 mg/L and 8 mg/L respectively. What is this indicative of? Explain why the BOD level gets reduced considerably at the collection point C?</p> <div data-bbox="302 852 1349 1224" data-label="Diagram"> <p>The diagram illustrates a river segment flowing from left to right. The left side is labeled 'Upstream' and the right side 'Downstream'. A 'Sugar factory' is located on the left bank. A 'Sewage Discharge Point' is marked on the riverbank between points A and B. A 'SEWAGE TREATMENT PLANT' (STP) is located on the right bank between points B and C. Sampling points A, B, and C are marked along the river. A north arrow is shown in the top right corner.</p> </div>	<p>2</p>
<p>5</p>	<p>An ecologist study an area with population A, thriving on unlimited resources and showing exponential growth, introduced population B and C to the same area. What will be the effect on the growth pattern of the population A, B and C when living together in the same habitat?</p>	<p>2</p>
<p>6</p>	<p>With the decline in the population of fig species it was noticed that the population of wasp species also started to decline. What is the relationship between the two and what could be the possible reason for decline of wasps? OR With the increase in the global temperature, the inhabitants of Antarctica are facing fluctuations in the temperature. Out of the <i>regulators</i> and the <i>conformers</i>, which of the two will have better chances of survival? Give two adaptations that support them to survive in the ambient environment? Give one suitable example.</p>	<p>2</p>

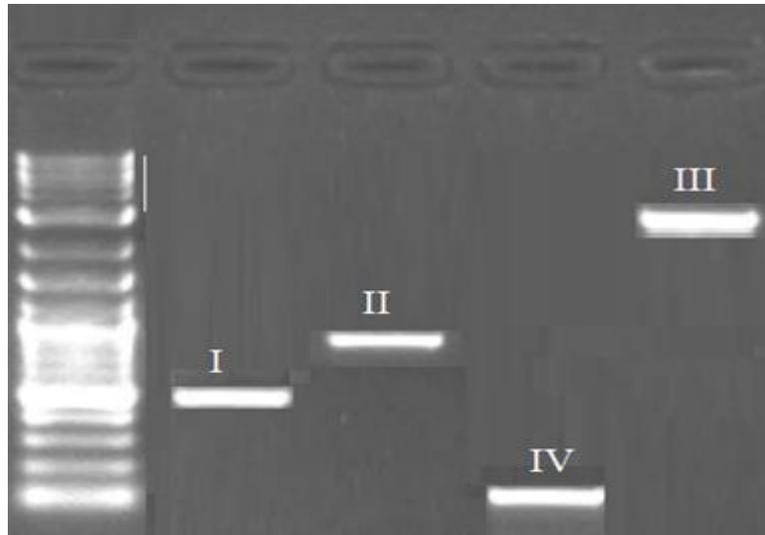
SECTION B

7	<p>How do normal cells get transformed into cancerous neoplastic cells? Elaborate giving three examples of inducing agent.</p> <p>OR</p> <p>A person is suffering from a high-grade fever. Which symptoms will help to identify if he/she is suffering from Typhoid, Pneumonia or Malaria?</p>	3
8	<p>Recognition of an antigenic protein of a pathogen or exposure to a pathogen occurs during many types of immune responses, including active immunity and induced active immunity.</p> <p>Specify the types of responses elicited when human beings get encountered by a pathogen.</p>	3
9	<p>In a pathological lab, a series of steps were undertaken for finding the gene of interest. Describe the steps, or make a flow chart showing the process of amplification of this gene of interest.</p>	3
10	<p>a. 'The Evil Quartet' describes the rates of species extinction due to human activities. Explain how the population of organisms is affected by fragmentation the habitats.</p> <p>b. Introduction of alien species has led to environmental damage and decline of indigenous species. Give any one example of how it has affected the indigenous species?</p> <p>c. Could the extinction of Steller's sea cow and passenger pigeon be saved by man? Give reasons to support your answer.</p>	3
11	<p>a. The image shown below is of a sacred grove found in India. Explain how has human involvement helped in the preservation of these biodiversity rich regions.</p> <div style="text-align: center;">  </div> <p>b. Value of Z (regression coefficient) is considered for measuring the species richness of an area. If the value of Z is 0.7 for area A ,and 0.15 for area B, which area has higher species richness and a steeper slope?</p>	3

12

The image below depicts the result of gel electrophoresis

3



If the ladder represents sequence length upto 3000 base pairs (bp),

- Which of the bands (I - IV) correspond to 2500 bp and 100 bp respectively?
- Explain the basis of this kind of separation and also mention the significance of this process.

SECTION C

13

Some restriction enzymes break a phosphodiester bond on both the DNA strands, such that only one end of each molecule is cut and these ends have regions of single stranded DNA. BamH1 is one such restriction enzyme which binds at the recognition sequence, 5'-GGATCC- 3' and cleaves these sequences just after the 5'- guanine on each strand.

5

- What is the objective of this action?
- Explain how the gene of interest is introduced into a vector.
- You are given the DNA shown below.

5' ATTTTGAGGATCCGTAATGTCCT 3'

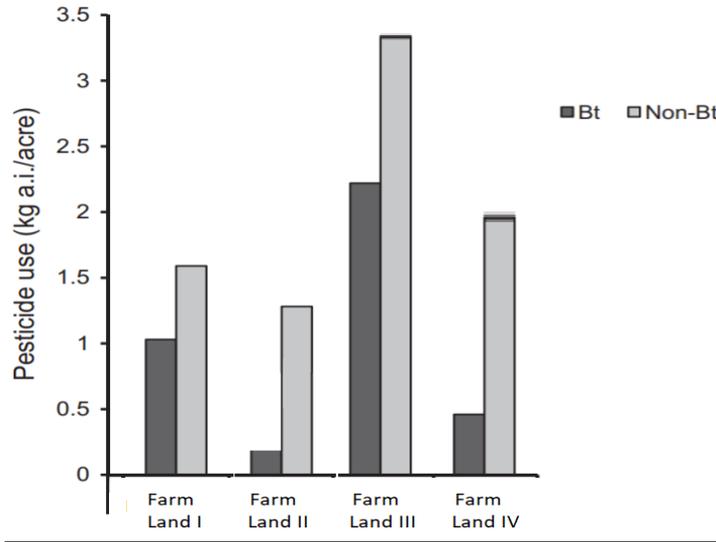
3' TAAACTCCTAGGCATTACAGGA 5'

If this DNA was cut with BamHI, how many DNA fragments would you expect? Write the sequence of these double-stranded DNA fragments with their respective polarity.

- A gene M was introduced into *E.coli* cloning vector PBR322 at BamH1 site. What will be its impact on the recombinant plasmids? Give a possible way by which you could differentiate non recombinant to recombinant plasmids.

OR

GM crops especially Bt crops are known to have higher resistance to pest attacks. To substantiate this an experimental study was conducted in 4 different farmlands growing Bt and non Bt-Cotton crops. The farm lands had the same dimensions, fertility and were under similar climatic conditions. The histogram below shows the usage of pesticides on Bt crops and non-Bt crops in these farm lands.



- Which of the above 4 farm lands has successfully applied the concepts of Biotechnology to show better management practices and use of agrochemicals? If you had to cultivate, which crop would you prefer (Bt or Non- Bt) and why?
- Cotton Bollworms were introduced in another experimental study on the above farm lands **wherein no pesticide was used**. Explain what effect would a Bt and Non Bt crop have on the pest.

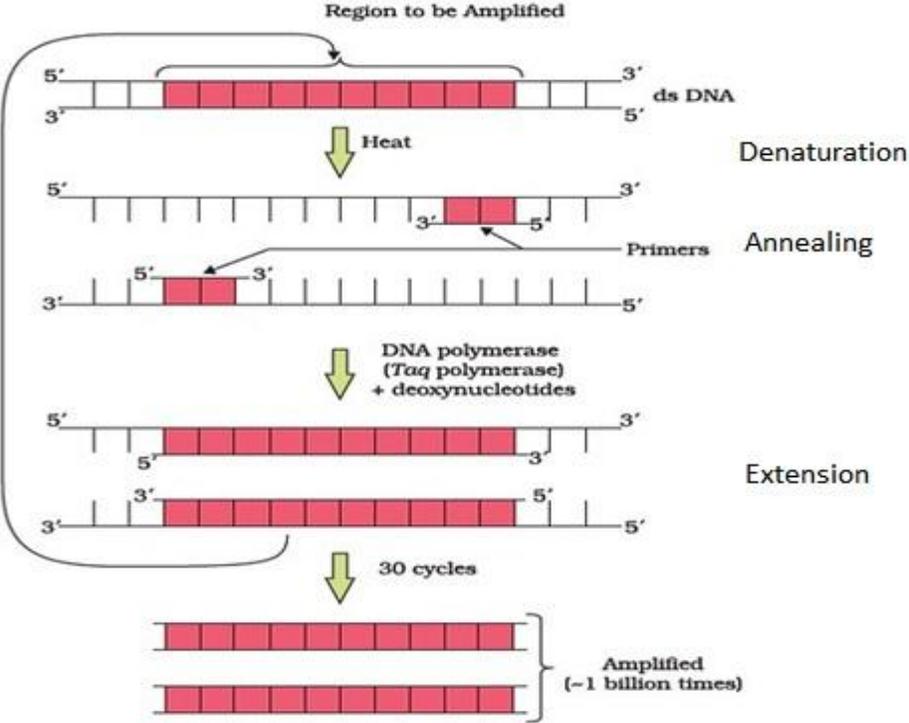
MARKING SCHEME (SQP)
CLASS XII
BIOLOGY (044)
TERM II (2021-22)

Q. No.	Section A	Marks
1	<p>Microbial pathogens enter the gut of humans along with food:</p> <ul style="list-style-type: none"> • Physical barriers: Mucus coating of the epithelium lining the gastrointestinal tract helps in trapping microbes entering our body. (1 Mark) • Physiological barriers: Acid in the stomach, saliva in the mouth prevent microbial growth. ($\frac{1}{2}+\frac{1}{2}$ Mark) 	2
2	<p>Streptokinase (produced by the bacterium <i>Streptococcus</i>) is used as a 'clot buster' for removing clots from the blood vessels of patients who have undergone myocardial infarction. (1 mark)</p> <p>Statins (produced by the yeast <i>Monascus purpureus</i>) act as blood-cholesterol lowering agents. (1 mark)</p> <p>OR</p> <p>Eradication of pests will disrupt predator-prey relationships, where beneficial predatory and parasitic insects which depend upon flora and fauna as food or hosts, may not be able to survive. (1 mark)</p> <p>Holistic approach ensures that various life forms that inhabit the field, their life cycles, patterns of feeding and the habitats that they prefer are extensively studied and considered. (1 mark)</p>	2
3	<p>It is Morphine. (1/2 mark)</p> <p>Physically it appears as a white, odourless, crystalline compound. (1½ mark)</p>	2
4	<p>At collection points A and B, the BOD level is high due to high organic pollution caused by sugar factory and sewage discharge. (1 mark)</p> <p>At the collection point C, the water was released after secondary treatment/ biological treatment (where vigorous growth of useful aerobic microbes into flocs consume the major part of the organic matter present in the river water or effluent due to sugar factory and sewage discharge). (1 mark)</p>	2

5	<p>This interaction will lead to competition between the individuals of population A,B and C for resources. Eventually the 'fittest' individuals will survive and reproduce. (1 mark)</p> <p>The resources for growth will become finite and limiting, and population growth will become realistic. (1 mark)</p>	2
6	<p>The relationship between the plant and pollinator is called mutualism. Fig depends on wasp for pollination, and wasp depends on fig for food and shelter. (1 mark)</p> <p>With the decline in population of figs, wasp loses its source of food and shelter. (1 mark)</p> <p>OR</p> <p>Regulators; Thermoregulation, Osmoregulation Birds/mammals (any one) (½ x 4 Marks)</p>	2

SECTION B

7	<p>Transformation of normal cells into cancerous neoplastic cells may be induced by following physical, chemical or biological agents causing DNA damage:</p> <ul style="list-style-type: none"> ● Ionising radiations like X-rays and gamma rays ● Non-ionizing radiations like UV. ● Chemical carcinogens present in tobacco smoke ● Cellular oncogenes (c-onc) or proto-oncogenes, when activated under certain conditions cause cancer. Viruses with oncogenes can transform normal cells to cancerous cells. (any 3; 1 x 3 marks) <p>OR</p> <p>If the person has sustained high fever (39° to 40°C), weakness, stomach pain, constipation, headache and loss of appetite, it is Typhoid. (1 mark)</p> <p>If the person has fever, chills, cough and headache; and the lips and fingernails turn gray to bluish, it is Pneumonia. (1 mark)</p> <p>If the person has chills and high fever recurring every three to four days then, it is Malaria. (1 mark)</p>	3
8	<ul style="list-style-type: none"> ● When our body encounters an antigenic protein or a pathogen for the first time it produces a response which is of low intensity and our body retains memory of the first encounter. (1 mark) ● The subsequent encounter with the same pathogen elicits a highly intensified response carried out with the help of two special types of lymphocytes present in our blood, B- 	3

	<p>lymphocytes, and T-lymphocytes. (1 mark)</p> <ul style="list-style-type: none"> The B-lymphocytes produce an army of proteins in response to these pathogens into our blood to fight with them. These proteins are called antibodies. The T-cells themselves do not secrete antibodies but help B-cells produce them. (1 mark) 	
<p>9</p>	<p>The flow chart shows the three steps involved in the process of PCR showing the following</p> <ul style="list-style-type: none"> - Denaturation The DNA strands are treated with a temperature of 94°C (Heat) and the strands are separated. - Annealing The primers anneal to the complementary strands - Extension The DNA polymerase facilitates the extension of the strands. (1x3=3 marks) <p>OR</p>  <p style="text-align: center;">Diagram : Polymerase Chain Reaction</p>	<p>3</p>
<p>10</p>	<p>a. When a large habitat is broken into small fragments due to various activities, mammals and birds requiring large territories and certain animals with migratory habitats are badly affected, leading to population decline. (1 mark)</p> <p>b.</p> <ul style="list-style-type: none"> Nile perch introduced in Lake Victoria eventually led to the extinction of an ecologically unique assemblage of more than 200 species of cichlid fish. 	<p>3</p>

	<ul style="list-style-type: none"> Parthenium/Lantana/water hyacinth caused environmental damage and threat to our native species African catfish-<i>Clarias gariepinus</i> introduced for aquaculture purposes is posing a threat to the indigenous catfishes in our rivers. (Any one) (1 mark) <p>c. Yes; Humans have overexploited natural resources for their 'greed' rather than 'need' leading to extinction of these animals. Sustainable harvesting could have prevented extinction of these species. (1 mark)</p>	
11	<p>a. India's history of religious and cultural traditions emphasized the protection of nature. In many cultures, tracts of forest are set aside, all the trees and wildlife within are venerated and given total protection. Sacred groves in many states are the last refuges for a large number of rare and threatened plants. (2 marks)</p> <p>b. Area A will have more species richness and a steeper slope. (1 mark)</p>	3
12	<p>a. Band III corresponds to 2500 base pairs, and Band IV corresponds to 100bp. ($\frac{1}{2} + \frac{1}{2}$ mark)</p> <p>b. The fragments will resolve according to their size. The shorter sequence fragments would move farthest from well as seen in Band IV (100 bp) which is lighter as compared to Band III which is heavier being 2500 base pairs. (1 mark)</p> <p>The significance of electrophoresis is to purify the DNA fragments for use in constructing recombinant DNA by joining them with cloning vectors. (1 mark)</p>	3
SECTION C		
13	<p>a. The two different DNA molecules will have compatible ends to recombine. ($\frac{1}{2}$ mark)</p> <p>b. Restriction enzyme cuts the DNA of the vector and then ligates the gene of interest into the DNA of the vector. (1 mark)</p> <p>c. 2 fragments ($\frac{1}{2}$ mark)</p> <p>5' ATTTTGAG 3' 5'GATCCGTAATGTCCT 3' 3' TAAAACTCCTAG 5'.3'GCATTACAGGA 5' (1 mark)</p> <p>d. BamH1 site will affect tetracycline antibiotic resistance gene, hence the recombinant plasmids will lose tetracycline resistance due to inactivation of the resistance gene. (1 mark)</p> <p>Recombinants can be selected from non recombinants by plating into a medium containing tetracycline, as the recombinants will not grow in the medium because the tetracycline resistance gene is cut. (1 mark)</p>	5

OR

- a. Farm Land II. (½ mark)
Bt crop. (½ mark)
Because the use of pesticides is highly reduced for Bt crop
// Decrease of pesticide used is also more significant for
Bt crop. (1 mark)
- b. In Bt cotton a cry gene has been introduced from bacterium
Bacillus thuringiensis (Bt) which causes synthesis of a toxic
protein. This protein becomes active in the alkaline gut of
bollworm feeding on cotton, punching holes in the lining
causing death of the insect. (2 marks)
However; a Non Bt crop will have no effect on the cotton
bollworm/ the yield of cotton will decrease / non Bt will
succumb to pest attack. (1 mark)

Sample Question Paper
COMPUTER SCIENCE (Code: 083)

Maximum Marks: 35

Time: 2 hours

General Instructions

- The question paper is divided into 3 sections – A, B and C
- Section A, consists of 7 questions (1-7). Each question carries 2 marks.
- Section B, consists of 3 questions (8-10). Each question carries 3 marks.
- Section C, consists of 3 questions (11-13). Each question carries 4 marks.
- Internal choices have been given for question numbers 7, 8 and 12.

Section -A			
Each question carries 2 marks			
Q. No	Part No.	Question	Marks
1.		Give any two characteristics of stacks.	(2)
2.	(i)	Expand the following: SMTP , XML	(1)
	(ii)	Out of the following, which is the fastest wired and wireless medium of transmission? Infrared, coaxial cable, optical fibre, microwave, Ethernet cable	(1)
3.		Differentiate between char(n) and varchar(n) data types with respect to databases.	(2)
4.		A resultset is extracted from the database using the cursor object (that has been already created) by giving the following statement. Mydata=cursor.fetchone () (a) How many records will be returned by fetchone() method? (b) What will be the datatype of Mydata object after the given command is executed?	(2)

5.		<p>Write the output of the queries (a) to (d) based on the table, Furniture given below:</p> <p>Table: FURNITURE</p> <table border="1" data-bbox="363 298 1199 848"> <thead> <tr> <th>FID</th> <th>NAME</th> <th>DATEOFPURCHASE</th> <th>COST</th> <th>DISCOUNT</th> </tr> </thead> <tbody> <tr> <td>B001</td> <td>Double Bed</td> <td>03-Jan-2018</td> <td>45000</td> <td>10</td> </tr> <tr> <td>T010</td> <td>Dining Table</td> <td>10-Mar-2020</td> <td>51000</td> <td>5</td> </tr> <tr> <td>B004</td> <td>Single Bed</td> <td>19-Jul-2021</td> <td>22000</td> <td>0</td> </tr> <tr> <td>C003</td> <td>Long Back Chair</td> <td>30-Dec-2016</td> <td>12000</td> <td>3</td> </tr> <tr> <td>T006</td> <td>Console Table</td> <td>17-Nov-2019</td> <td>15000</td> <td>12</td> </tr> <tr> <td>B006</td> <td>Bunk Bed</td> <td>01-Jan-2021</td> <td>28000</td> <td>14</td> </tr> </tbody> </table> <p>(a) <code>SELECT SUM(DISCOUNT) FROM FURNITURE WHERE COST>15000;</code></p> <p>(b) <code>SELECT MAX (DATEOFPURCHASE) FROM FURNITURE;</code></p> <p>(c) <code>SELECT * FROM FURNITURE WHERE DISCOUNT>5 AND FID LIKE "T%";</code></p> <p>(d) <code>SELECT DATEOFPURCHASE FROM FURNITURE WHERE NAME IN ("Dining Table", "Console Table");</code></p>	FID	NAME	DATEOFPURCHASE	COST	DISCOUNT	B001	Double Bed	03-Jan-2018	45000	10	T010	Dining Table	10-Mar-2020	51000	5	B004	Single Bed	19-Jul-2021	22000	0	C003	Long Back Chair	30-Dec-2016	12000	3	T006	Console Table	17-Nov-2019	15000	12	B006	Bunk Bed	01-Jan-2021	28000	14	(2)
FID	NAME	DATEOFPURCHASE	COST	DISCOUNT																																		
B001	Double Bed	03-Jan-2018	45000	10																																		
T010	Dining Table	10-Mar-2020	51000	5																																		
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T006	Console Table	17-Nov-2019	15000	12																																		
B006	Bunk Bed	01-Jan-2021	28000	14																																		
6.	(i)	Which command is used to view the list of tables in a database?	(1)																																			
	(ii)	Give one point of difference between an equi-join and a natural join.	(1)																																			
7.		<p>Consider the table, MOVIEDETAILS given below:</p> <p>Table: MOVIEDETAILS</p> <table border="1" data-bbox="363 1709 1248 1818"> <thead> <tr> <th>MOVIEID</th> <th>TITLE</th> <th>LANGUAGE</th> <th>RATING</th> <th>PLATFORM</th> </tr> </thead> <tbody> <tr> <td>M001</td> <td>Minari</td> <td>Korean</td> <td>5</td> <td>Netflix</td> </tr> <tr> <td>M004</td> <td>MGR Magan</td> <td>Tamil</td> <td>4</td> <td>Hotstar</td> </tr> </tbody> </table>	MOVIEID	TITLE	LANGUAGE	RATING	PLATFORM	M001	Minari	Korean	5	Netflix	M004	MGR Magan	Tamil	4	Hotstar	(2)																				
MOVIEID	TITLE	LANGUAGE	RATING	PLATFORM																																		
M001	Minari	Korean	5	Netflix																																		
M004	MGR Magan	Tamil	4	Hotstar																																		

M010	Kaagaz	Hindi	3	Zee5
M011	Harry Potter and the Chamber of Secrets	English	4	Prime Video
M015	Uri	Hindi	5	Zee5
M020	Avengers: Endgame	English	4	Hotstar

- (a) Identify the degree and cardinality of the table.
(b) Which field should be made the primary key? Justify your answer.

OR

- (a) Identify the candidate key(s) from the table **MOVIEDETAILS**.
(b) Consider the table **SCHEDULE** given below:

Table: SCHEDULE

SLOTID	MOVIEID	TIMESLOT
S001	M010	10 AM to 12 PM
S002	M020	2 PM to 5 PM
S003	M010	6 PM to 8 PM
S004	M011	9 PM to 11 PM

Which field will be considered as the foreign key if the tables **MOVIEDETAILS** and **SCHEDULE** are related in a database?

SECTION – B
Each question carries 3 marks

8. Julie has created a dictionary containing names and marks as key value pairs of 6 students. Write a program, with separate user defined functions to perform the following operations:
- Push the keys (name of the student) of the dictionary into a stack, where the corresponding value (marks) is greater than 75.
 - Pop and display the content of the stack.
- For example:
If the sample content of the dictionary is as follows:

		<p>R={"OM":76, "JAI":45, "BOB":89, "ALI":65, "ANU":90, "TOM":82}</p> <p>The output from the program should be: TOM ANU BOB OM</p> <p style="text-align: center;">OR</p> <p>Alam has a list containing 10 integers. You need to help him create a program with separate user defined functions to perform the following operations based on this list.</p> <ul style="list-style-type: none"> • Traverse the content of the list and push the even numbers into a stack. • Pop and display the content of the stack. <p>For Example: If the sample Content of the list is as follows: N=[12, 13, 34, 56, 21, 79, 98, 22, 35, 38]</p> <p>Sample Output of the code should be: 38 22 98 56 34 12</p>													
9.	(i)	<p>A table, ITEM has been created in a database with the following fields: ITEMCODE, ITEMNAME, QTY, PRICE</p> <p>Give the SQL command to add a new field, DISCOUNT (of type Integer) to the ITEM table.</p>	(1)												
	(ii)	<p>Categorize following commands into DDL and DML commands?</p> <p>INSERT INTO, DROP TABLE, ALTER TABLE, UPDATE...SET</p>	(2)												
10.		<p>Charu has to create a database named MYEARTH in MYSQL. She now needs to create a table named CITY in the database to store the records of various cities across the globe. The table CITY has the following structure:</p> <p>Table: CITY</p> <table border="1"> <thead> <tr> <th>FIELD NAME</th> <th>DATA TYPE</th> <th>REMARKS</th> </tr> </thead> <tbody> <tr> <td>CITYCODE</td> <td>CHAR(5)</td> <td>Primary Key</td> </tr> <tr> <td>CITYNAME</td> <td>CHAR(30)</td> <td></td> </tr> <tr> <td>SIZE</td> <td>INTEGER</td> <td></td> </tr> </tbody> </table>	FIELD NAME	DATA TYPE	REMARKS	CITYCODE	CHAR(5)	Primary Key	CITYNAME	CHAR(30)		SIZE	INTEGER		(3)
FIELD NAME	DATA TYPE	REMARKS													
CITYCODE	CHAR(5)	Primary Key													
CITYNAME	CHAR(30)														
SIZE	INTEGER														

AVGTEMP	INTEGER	
POLLUTIONRATE	INTEGER	
POPULATION	INTEGER	

Help her to complete the task by suggesting appropriate SQL commands.

Section C
Each question carries 4 marks

11.

Write queries (a) to (d) based on the tables **EMPLOYEE** and **DEPARTMENT** given below:

(4)

Table: EMPLOYEE

EMPID	NAME	DOB	DEPTID	DESIG	SALARY
120	Alisha	23- Jan- 1978	D001	Manager	75000
123	Nitin	10- Oct- 1977	D002	AO	59000
129	Navjot	12- Jul- 1971	D003	Supervisor	40000
130	Jimmy	30- Dec- 1980	D004	Sales Rep	
131	Faiz	06- Apr- 1984	D001	Dep Manager	65000

Table: DEPARTMENT

DEPTID	DEPTNAME	FLOORNO
D001	Personal	4
D002	Admin	10
D003	Production	1
D004	Sales	3

(a) To display the average salary of all employees, department wise.

(b) To display name and respective department name of each employee whose salary is more than 50000.

		<p>(c) To display the names of employees whose salary is not known, in alphabetical order.</p> <p>(d) To display DEPTID from the table EMPLOYEE without repetition.</p>													
12.	(i)	<p>Give two advantages and two disadvantages of star topology</p> <p style="text-align: center;">OR</p> <p>Define the following terms: www, web hosting</p>	(2)												
	(ii)	How is packet switching different from circuit switching?	(2)												
13.		<p>BeHappy Corporation has set up its new centre at Noida, Uttar Pradesh for its office and web-based activities. It has 4 blocks of buildings.</p> <div style="border: 1px solid black; padding: 10px; margin: 10px auto; width: fit-content;"> <p style="text-align: center;">BeHappy Corporation</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; padding: 5px; margin: 5px;">Block A</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">Block B</div> </div> <div style="display: flex; justify-content: space-around; align-items: center; margin-top: 20px;"> <div style="border: 1px solid black; padding: 5px; margin: 5px;">Block C</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">Block D</div> </div> </div> <p>Distance between the various blocks is as follows:</p> <table style="margin-left: 40px;"> <tr><td>A to B</td><td>40 m</td></tr> <tr><td>B to C</td><td>120m</td></tr> <tr><td>C to D</td><td>100m</td></tr> <tr><td>A to D</td><td>170m</td></tr> <tr><td>B to D</td><td>150m</td></tr> <tr><td>A to C</td><td>70m</td></tr> </table> <p>Numbers of computers in each block Block A - 25</p>	A to B	40 m	B to C	120m	C to D	100m	A to D	170m	B to D	150m	A to C	70m	(4)
A to B	40 m														
B to C	120m														
C to D	100m														
A to D	170m														
B to D	150m														
A to C	70m														

Block B - 50

Block C - 125

Block D - 10

- (a) Suggest and draw the cable layout to efficiently connect various blocks of buildings within the Noida centre for connecting the digital devices.
- (b) Suggest the placement of the following device with justification
- i. Repeater
 - ii. Hub/Switch
- (c) Which kind of network (PAN/LAN/WAN) will be formed if the Noida office is connected to its head office in Mumbai?
- (d) Which fast and very effective wireless transmission medium should preferably be used to connect the head office at Mumbai with the centre at Noida?

Marking Scheme

COMPUTER SCIENCE (Code : 083)

Maximum Marks: 35

Time: 2 hours

General Instructions

- The question paper is divided into 3 sections – A, B and C
- Section A, consists of 7 questions (1-7). Each question carries 2 marks.
- Section B, consists of 3 questions (8-10). Each question carries 3 marks.
- Section C, consists of 3 questions(11-13). Each question carries 4 marks.
- Internal choices have been given for question numbers – 7, 8 and 12

Section -A				
Each question carries 2 marks				
Q. No	Part No.	Question	Marking Instructions	Marks
1.		Characteristics of Stacks: <ul style="list-style-type: none">• It is a LIFO data structure• The insertion and deletion happens at one end i.e. from the top of the stack	1 mark for each point	(2)
2.	(i)	SMTP : Simple Mail Transfer Protocol XML: Extensible Mark Up Language	½ mark for each correct expansion	(1)
	(ii)	Wired- optical fibre Wireless – microwave	½ mark for each correct answer	(1)
3.		char(n): <ul style="list-style-type: none">• stores a fixed length string between 1 and 255 characters• if the value is of smaller length, adds blank spaces• some space is wasted varchar(n) : <ul style="list-style-type: none">• stores a variable length string• no blanks are added even if value is of smaller length• no wastage of space	1 mark for each correct difference (minimum 2 differences to be given)	(2)

4.		(a) One record (b) tuple	1 mark for each correct answer	(2)					
5.		(a) 29 (b) 19-Jul-2021 (c) <table border="1" data-bbox="351 536 1030 616"> <tr> <td>T006</td> <td>Console Table</td> <td>17-Nov-2019</td> <td>15000</td> <td>12</td> </tr> </table> (d) 10-Mar- 2020 17-Nov-2019	T006	Console Table	17-Nov-2019	15000	12	½ mark for each correct output	(2)
T006	Console Table	17-Nov-2019	15000	12					
6.	(i)	SHOW TABLES;	1 mark for correct answer	(1)					
	(ii)	Equi- join: <ul style="list-style-type: none"> The join in which columns from two tables are compared for equality Duplicate columns are shown Natural Join <ul style="list-style-type: none"> The join in which only one of the identical columns existing in both tables is present No duplication of columns 	1 mark for correct difference (Any one point may be given)	(1)					
7.		(a) Degree: 5 Cardinality: 6 (b) MOVIEID should be made the primary key as it uniquely identifies each record of the table.	½ mark each for correct degree and cardinality ½ mark for correct field and ½ mark for justification	(2)					

		OR		
		(a) MOVIEID and TITLE	½ mark for each correct field name	
		(b) MOVIEID	1 mark for correct answer	
		SECTION – B Each question carries 3 marks		
8.		<pre> # Question No 8 (first option) R={"OM":76, "JAI":45, "BOB":89, "ALI":65, "ANU":90, "TOM":82} def PUSH(S,N): S.append(N) def POP(S): if S!=[]: return S.pop() else: return None ST=[] for k in R: if R[k]>=75: PUSH(ST,k) while True: if ST!=[]: print(POP(ST),end=" ") else: break </pre>	<p>1 mark for correct PUSH operation</p> <p>1 mark for correct POP operation</p> <p>1 mark for correct function calls and displaying the output</p>	(3)
		OR		
		<pre> # Question No 8 (second option) N=[12, 13, 34, 56, 21, 79, 98, 22, 35, 38] def PUSH(S,N): </pre>	1 mark for correct PUSH operation	

		<pre> S.append(N) def POP(S): if S!=[]: return S.pop() else: return None ST=[] for k in N: if k%2==0: PUSH(ST,k) while True: if ST!=[]: print(POP(ST),end=" ") else: break </pre>	<p>1 mark for correct POP operation</p> <p>1 mark for correct function calls and displaying the output</p> <p>Note: Marks to be awarded for any other correct logic given by the student</p>	
9.	(i)	<pre> ALTER TABLE Item ADD (Discount INT); </pre>	1 mark for correct command	(1)
	(ii)	<pre> DDL: DROP TABLE, ALTER TABLE DML: INSERT INTO, UPDATE...SET </pre>	½ mark for each correct command identified	(2)
10.		<pre> CREATE DATABASE MYEARTH; CREATE TABLE CITY (CITYCODE CHAR(5) PRIMARY KEY, CITYNAME CHAR(30), SIZE INT, AVGTEMP INT, POPULATIONRATE INT, POPULATION INT,); </pre>	<p>1 mark for correctly creating database.</p> <p>2 marks for correctly creating the table.</p>	(3)
		<p>Section C</p> <p>Each question carries 4 marks</p>		
11.		(a) SELECT AVG(SALARY)		

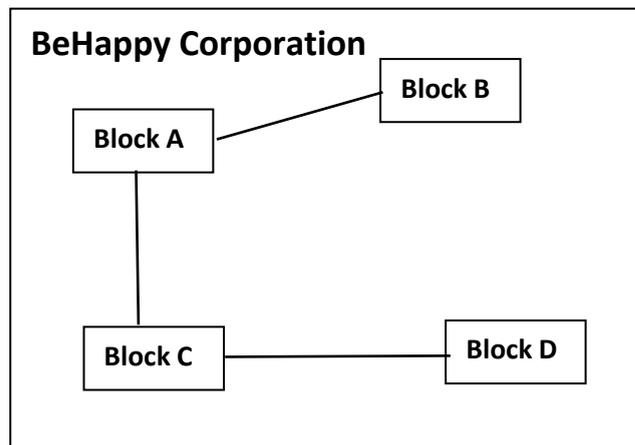
		<p>FROM EMPLOYEE GROUP BY DEPTID ;</p> <p>(b) SELECT NAME, DEPTNAME FROM EMPLOYEE, DEPARTMENT WHERE EMPLOYEE.DEPTID= DEPARTMENT.DEPTID AND SALARY>50000 ;</p> <p>(c) SELECT NAME FROM EMPLOYEE WHERE SALARY IS NULL ORDER BY NAME ;</p> <p>(d) SELECT DISTINCT DEPTID FROM EMPLOYEE ;</p>	1 mark for each correct query	(4)
12.	(i)	<p>Advantages</p> <ul style="list-style-type: none"> • Ease of service • Centralized control • Easy to diagnose faults • One device per connection <p>Disadvantages</p> <ul style="list-style-type: none"> • long cable length • difficult to expand • central node dependency <p style="text-align: center;">OR</p> <p>www: a set of protocols that allow you to access any document on the internet through the naming systems based on URLs</p> <p>Web hosting: Web hosting is a service that allows organizations and individuals to post a website or web page onto the server, which can be viewed by everyone on the Internet.</p>	<p>½ mark for each correct advantage / disadvantage</p> <p>1 mark for each correct definition</p>	(2)
	(ii)	<p>Packet switching:</p> <ul style="list-style-type: none"> • uses store and forward concept to send messages • no physical path is actually establishes • message is divided into smaller parts, known as packets and then sent forward • tight upper limit on block size • Each data unit knows only the final receiver's address 	<p>1 mark for each correct difference</p> <p>(minimum two points should be given)</p>	(2)

Circuit switching

- physical connection is established between sender and receiver
- Each data unit knows the entire path from sender to receiver
- It does not follow store and forward concept

13.

(a)



(b)

Repeater : between C and D as the distance between them is 100 mts.

Hub/ Switch : in each block as they help to share data packets within the devices of the network in each block

(c) WAN.

(d) Satellite

(4)

1 mark for each correct answer

SAMPLE QUESTION PAPER
PHYSICAL EDUCATION (048)
SESSION 2021-22(CLASS XII)
TERM II

Max Marks: 35

Time: 2 hrs

General instructions:

- 1. There are three sections in the Question paper namely Section A, Section B and Section C.**
- 2. Section A consists of 9 questions amongst which 7 questions have to be attempted each question carries 2 marks and should have 30-50 words.**
- 3. Section B consists of 5 questions amongst which 3 questions have to be attempted each question carries 3 marks and should have 80-100 words.**
- 4. Section C consists of 4 questions amongst which 3 questions have to be attempted each question carries 4 marks and should have 100-150 words.**

(SECTION A)

- Q1. Explain any two benefits of ardha matsyendrasana. (1+1)
- Q2. Define explosive strength with help of example. (1+1)
- Q3. Define personality and motivation. (1+1)
- Q4. Write the full form of SPD and ASD. (1+1)
- Q5. List any four changes happening in the muscular system due to exercising. (0.5*4)
- Q6. What is the meaning of the Isotonic method and it is used for developing which ability. (1+1)
- Q7. Mention any two symptoms and causes of ADHD. (1+1)
- Q8. What is Laceration and how can it be managed? (1+1)
- Q9. List down any two strategies to make physical activities accessible for CWSN. (1+1)

(SECTION B)

- Q10. List down and briefly explain any four techniques of motivation. {1+(0.5*4)}
- Q11. Explain cognitive disability along with its symptoms. (1+2)
- Q12. Create a flowchart to explain classification of sports injuries. (1+1+1)

For visually impaired candidates

Explain classification of sports injuries. (1+1+1)

Q13. List down any three asanas used for preventing Asthma and write two benefits of each. (1+2)

Q14. What are the salient features of the Fartlek training method? (1*3)

(SECTION C)

- Q15. Explain any three personality types of Big five theory. (1+3)
- Q16. Discuss physiological factors determining speed. (1*4)
- Q17. Define flexibility and explain methods to develop flexibility. (1+3)
- Q18. Briefly explain the administration of Pawanmuktasana long with its contraindications and draw stick diagram. (2+1+1)

For visually impaired candidates

Briefly explain the administration of Pawanmuktasana long with its contraindications (2+2)

PHYSICAL EDUCATION
CLASS - XII
MARKING SCHEME
TERM 2
(2021-2022)

Q.NO	ANSWER	MARKS
1.	<p>Benefits of Ardha Matsyendrasana (Any two)</p> <ul style="list-style-type: none"> (i) It loses extra fat and makes the body beautiful and strong. (ii) It stimulates the liver, spleen and pancreas. (iii) It is beneficial for the respiratory system. (iv) It strengthens the spinal column and back muscles. (v) It glorifies the face and keeps the menstrual cycle in women in control. (vi) It rejuvenates the nerves around. (vii) It heals back pain, stress, and headache. (viii) It is helpful for people suffering from diabetes. 	(1+1=2)
2.	<p>Explosive Strength: It is the ability to overcome resistance with high speed. It is used in take-off jumping events like long jump, high jump, triple jump, jumping in volleyball for smashing or spiking, jumping for rebound in basketball.</p>	(1+1=2)
3.	<p>PERSONALITY According to Begge and Hunt, <i>“Personality refers to the whole behavioral pattern of an individual to the totality of its characteristics.”</i> According to Velentine, <i>“Personality is the sum-total of inherited and acquired abilities.”</i> According to Guild Ford, <i>“Personality is an individual’s unique pattern of traits.”</i> According to Sigmund Freud, <i>“Personality is an individual’s unique thought, feeling and behavior that persist over time and different situations.”</i> According to Young, <i>“Personality is the totality of behavior of an individual with a given tendency system interacting with a sequence of situations.”</i> According to R.B. Cattell, <i>“Personality is that which permits a prediction of what a person will do in a given situation.”</i> On the basis of these definitions, a brief definition would be that, <i>“Personality is the sum total of inner and outer capabilities of an individual.”</i></p> <p>MOTIVATION According to Sage, <i>“The drive to strive is called motivation.”</i></p>	(1+1=2)

	<p>According to Crooks and Stein, <i>“Any condition that might energize and direct our actions” is called motivation.</i></p> <p>According to Morgan and King, <i>“Motivation refers to a state within a person or animal that drives behavior towards some goal.”</i></p> <p>According to P.T. Yong, <i>“Motivation is the process of arousing , action, sustaining the activities in progress, and regulating the patterns of activity.”</i></p> <p>According to Johnson, <i>“Motivation is the influence of a general pattern of activities indicating and directing the behavior of the organism.”</i></p>	
4.	Autism SPECTRUM Disorder (ASD) Sensory PROCESSING Disorder (SPD)	(1+1=2)
5.	<p>Changes happening in the muscular system due to exercising. (Any four)</p> <ol style="list-style-type: none"> 1. Change in size and shape of Muscle: Regular exercise helps in enlarging cells of muscles which in turn helps in changing size and shape of muscles. 2. Increase in the Strength of Muscles: A person who does exercise daily has stronger muscles and such muscles work more. These become stronger by getting more nutritious food in the form of oxygen. 3. Increase in Coordination: Regular exercise increases coordination in the muscles. These become stronger by doing exercise. As a result a person does not feel fatigue even by working for a long time. If the muscles do not have co-ordination or have incomplete co-ordination then the working becomes impossible. 4. Entrance of Greater Quantity of Oxygen in the Body: Muscles have to do more work during exercise. The consumption of oxygen increases in the person who exercises. Thus blood reaches quickly in the muscles. 5. Increase in Supply of Blood: Muscles get chemical substances like glycogenephoscoratine, potassium etc. by doing regular exercise. These chemical substances increase the speed of blood. 6. Proper Blood Circulation: During rest, the blood completes a round of the body in 21 seconds, but it completes the round in just 15, 10 or 8 seconds while exercising. The heart muscles work faster during exercise. 7. Effects on Bones and Joints: By doing exercise our bones become hard and they can work for more time. It also has effects on our joints. Thus the bones and muscles become strong by doing exercise. Children’s bones happen to be very soft and fragile. Activities of muscles affect these a lot. By the lack of these the bones remain soft and deformity takes place in them. 8. Effective Respiration: Regular exercise increases the capacity of chest 	(0.5*4=2)

	<p>muscles. As a result, the respiratory system gets effective.</p> <p>9. Increase in the Resistance Power of Body: Regular exercise develops the lungs in an equal way. By this the volume of lungs starts increasing. Thus develops the chest Skeleton and by doing exercise the condition of breathing improves. Thus, as a result of this improved breathing capacity the resistance capacity of the body increases.</p>	
<p>6.</p>	<p>Isotonic method Isotonic exercises were introduced by De Lorene in 1954. This term comes from the Greek word 'iso' which means 'same or equal' maintaining equal (muscle) tone or tension'. In this one muscle group contracts the opposite relaxes during which the muscle changes its length. These are those exercises in which direct movements are visible to the 3rd person. In this case, personal muscular efforts are evidenced by visible movements. In isotonic exercises rapid movements are accomplished by reflex alteration of contraction and relaxation of antagonistic flexors and extensors of the joints concerned. Type of contraction where we notice the movements of objects is called isotonic contraction e.g. doing exercise with light weight or dumbbells etc. Most of the exercises fall under this category Used to develop Strength.</p>	<p>(1+1=2)</p>
<p>7.</p>	<p>Symptoms of ADHD in Children</p> <ol style="list-style-type: none"> 1. They could not perform daily life activities. 1. They tend to forget routine work. 2. They indulge in daydreaming. 3. They do not like performing activities that require sitting still. 4. They get easily distracted. 5. They are weak in sports activities. 6. They do not take rest and usually roam around. 7. They could not have any control on their emotions. 8. They lack concentration and work carelessly. <p>Symptoms in Adu1ts</p> <ol style="list-style-type: none"> 1. They always remain worried. 2. They remain impulsive. 3. They have an inferiority complex. 4. They are always disorganized. 5. They easily get irritated. 6. They find difficulty in remembering things. 	<p>(1+1=2)</p>

	<p>7. Mood swings and depression are common in such adults.</p> <p>8. They cannot control their anger.</p> <p>9. They have problems with concentration.</p> <p>Causes of ADHD</p> <p>1. Heredity : If any parent is suffering from ADHD, there remains a high probability of occurrence of this disorder in their children.</p> <p>2. Pre-Nature Birth : If a child is delivered prematurely the nervous system is not fully developed which increases chances of occurrence of ADHD.</p> <p>3. Less Efficiency of Brain and Deformity : If there is deformity of brain shape that causes neural-imbalance which can cause ADHD.</p> <p>4. Less Birth Body Weight : If a child on birth has less body weight, ADHD, disorder remains a possibility.</p> <p>5. Consumption of Alcohol and Drugs : Consumption of alcohol and drugs always adversely affects our brain cells and nervous system.</p> <p>6. Exposure to Toxic Substance: Exposure to some toxic substance like lead can cause ADHD.</p> <p>7. Diet : Few researches have proved that a particular type of food substance plays a role in causing ADHD.</p>	
<p>8.</p>	<p>(a) Laceration: A laceration is an injury that results in an irregular break in the skin, more commonly referred to as a cut, but defined as a torn and ragged wound. Lacerations are caused when an object strikes the skin and causes a wound to open. Depending on a variety of characteristics (angle, force, depth, object), some lacerations can be more serious than others, reaching as far as deep tissue and leading to serious bleeding. The predominant symptoms of lacerations are mild to serious breaking of the epidermis, tears in the first layer of skin that can range from small slices to deep gashes. Depending on the depth of the laceration, there can be bleeding of different levels of severity. Mild lacerations may experience brief bleeding accompanied by mild pain. Deeper lacerations will experience greater bleeding and more intense pain.</p> <p>Treatment of laceration (Treatment Steps)</p> <ol style="list-style-type: none"> i. Stop bleeding at the earliest by compression or by pressing. ii. Clean the surface of the affected part using water and soap. iii. Cover the affected part with medicinal cotton bandage or apply band aid. iv. Repeat dressing or padding over the wound. If bleeding continues then apply 	<p>(1+1=2)</p>

	<p>further pads or dressing.</p> <p>v. Apply ice/cold for compression.</p> <p>vi. If injury is deep go for stitches at the earliest.</p>	
<p>9.</p>	<p>Strategies to make physical activities accessible for CWSN</p> <p>1. Interest: Physical activities must be based on interest, ability and limitation of children with special needs to ensure maximum participation.</p> <p>2. Ability: The physical and mental state of children with special needs shall be considered.</p> <p>3. Medical Check-up : First, it is mandatory to have a medical check-up of all children with special needs. Because without that we cannot know about the disability the child is having.</p> <p>4. Pre-experiences: Before deciding physical strategies, we shall know the children with their past experiences and convince them.</p> <p>5. Equipment: The equipment used should be according to capability and level of children. It may vary in size, shape, colour and weight.</p> <p>6. Specific Environment : A healthy and democratic environment shall be created so that CWSN can perform freely.</p> <p>7. Modified Rules : According to CWSN, the rules shall be diluted and modified according to their nature of disability.</p> <p>8. Easy to Difficult : The exercise shall be in progression from easily to difficult.</p> <p>9. Use of All Body Parts : Physical strategies shall involve. Whole body parts and ensure whole body movement.</p> <p>10. Extra Care of Concern : While deciding upon physical strategies for CWSN, extra care and concern shall be given like extra time, to avoid stress light music.</p>	<p>(1+1=2)</p>
<p>10.</p>	<p>Any four techniques of motivation</p> <p>1. Goal Setting: Goal setting is one of the most powerful techniques of motivation. The athlete should be very specific and clear about his goal. In other words, an athlete should be very clear what he has to do, how, and why. If these three things are clear in the mind of the athlete then there will be no problem in motivation and one will do the things accordingly. One should be prepared mentally to do the activity and work to achieve the goal. The goal should not be impossible to achieve, it should be in the reach of the individual. One should know the advantages of attaining the goal.</p>	<p>{1+(0.5*4)}=3</p>

- 2.Reinforcement:** Reinforcement is the use of rewards and punishments that will work to either encourage a certain action or decrease it in the future. There are two ways of using reinforcement - a positive and a negative approach. The positive approach focuses on reward appropriate behaviour this increases the likelihood of this behaviour happening again. The negative approach focuses on punishing undesirable behaviors and should lead to decrease of these behaviours in the future. Most coaches and instructors combine positive and negative approaches.
- 3.Knowledge of Progress:** The athlete should know fully about himself, his capacity, quality, behavior, etc. Periodic positive results act as a strong motivational force. One should be made aware about his progress from time to time. Knowledge of progress is must because progress is also a reward in itself.
- 4.Rewards:** They can be effective for further progress and to achieve goal. This can be very effective to motivate the players. Various rewards and cash prizes act as a strong motivational force to perform.
- 5.Jobs:** Outstanding sports persons can be offered good jobs according to their achievement and educational qualifications. There are various departments which provide jobs to good sports persons i.e. Police departments in various states, Indian railways, Banks, Air India, etc.
- 6. Social Awards:** The Government of India every year announces awards for outstanding sports persons who bring laurels for the country in various games and sports. They are honored with Arjuna Awards, Padama Shri, Rajiv Gandhi Khel Ratna Award, Dronacharya Award, Major Dhyan Chand Award, Padma Bhushan etc. Some special awards are also given for international achievements.
- 7.Positive talks:** Positive talk by the teachers or coaches is one of the best methods to motivate an individual. It can help the athlete to change his thinking and behaviour. It is most important even for players and athletes at international level. At lower stages it works as a most successful tool for motivation.
- 8.To provide best quality equipment** The players and athletes should be provided the best possible equipment, which will help the athlete to avoid sports injuries, best and easy practice without any tension in mind. Good quality equipment urges the participants to participate in the activity whereas old and sub-standard equipment may turn off the interest of the individual.
- 9.Positive attitude and environment:** It is most important to have a positive attitude and environment for a successful training programme. The coach and the trainee should have a positive attitude towards each other and towards the activity. The cordial environment plays a vital role to motivate

	<p>an athlete.</p> <p>10. Role of Mass Media: Television and Newspapers play an important role in motivating the players. When the media gives coverage and recognition to the performance of the sports persons it gives a boost to their self confidence.</p> <p>11. Role of Spectators: Crowd plays an important role in motivating the players. Good and positive responses of spectators encourage the sports persons to give their maximum.</p>	
<p>11.</p>	<p>1. Cognitive Disability</p> <p>This disorder comes in the mental disorder category. Due to cognitive disorder, a person's ability to learn, speak, memorize, and problem solving skills are disrupted. Due to cognitive disorder, the person suffers from dementia, and delirium disease. In addition, it adversely affects the memorizing power and reasoning power. Normally, these are various symptoms of these :</p> <ul style="list-style-type: none"> (i) Memory Disorder: The person who has a problem in listening and then recalling things. (ii) Hyper Activity: The person tends to hyper during sitting, standing phase, The person remains in undue hurry. (iii) Dyslexia: The person who faces problems in reading, writing and memorizing. <p>Cause of Cognitive Disability</p> <p>Cognitive disability normally occurs due to problems of the brain like tumor, head injury, shock, infection, harmful brain neurotoxins, heredity or any other brain related disease. It affects a person's memorizing power, learning skills and ability to do routine activities like, in case of tumor or head injury on part of the brain which controls speech control, can affect the speaking skills of that person. In same way, if brain tumor or head injury on that part of the brain which can hamper the physical movement or delving other physical activities.</p>	<p>1+2=3</p>

12.	<p style="text-align: center;">Common sport injuries</p> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="border: 1px solid black; padding: 5px; width: 30%;"> <p style="text-align: center;">Soft Tissues Injuries</p> <ul style="list-style-type: none"> - Contusion - Strain - Sprain - Abrasion - Incision </div> <div style="border: 1px solid black; padding: 5px; width: 30%;"> <p style="text-align: center;">Bone Injuries</p> <ul style="list-style-type: none"> - Green Stick fracture - Transverse fracture - Oblique fracture - Communicated fracture - Impacted fracture </div> <div style="border: 1px solid black; padding: 5px; width: 30%;"> <p style="text-align: center;">Joint Injuries</p> <ul style="list-style-type: none"> - Dislocation of lower jaw - Dislocation of shoulder jaw - Dislocation of hip joint </div> </div>	1+1+1=3
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13.	<p>ASTHMA :SUKHASANA, CHAKRASANA, GOMUKHASANA, PARVATASANA, BHUJANGASANA, PASCHIMOTTA- SANA, MATSYASANA</p>  <p style="text-align: center;">Gomukhasana - Cow Face Pose Fingers are locked at behind</p> <p style="text-align: center;">PASCHIMOTTANASANA THE FORWARD BEND POSE</p> <p style="text-align: center;">MATSYASANA THE FISH POSE</p> <p style="text-align: center;">PARVATASANA THE MOUNTAIN POSE</p> <p style="text-align: center;">BHUJANGASANA THE COBRA POSE</p>	{1+(0.5*4)}=3
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14.	10.2 Fartlek Training Method:	
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	<p>The Fartlek method of training was introduced and practiced in Sweden. 'Fartlek' is a Swedish term which means 'speed play' (playing with speed). This training method was first introduced by Gosta Holmer. It is a type of cross country running. Fartlek is usually conducted over a hilly region track, and it allows variation in pace. It is one of the best methods of conditioning for most of the sports in which endurance is the basic requirement. This training can be performed at hilly path, river bed, forest, muddy road or sandy path etc. Self-discipline is most important and vital in this type of training. In Fartlek, the change of pace or speed is not pre planned so some exercises can also be included in this method. These exercises may be performed by stopping and running temporarily at different intervals. The type of exercises that can be included along with running are hopping, jumping, squat jump, double hop jump etc.</p> <p>ADVANTAGES OF FARTLEK Training</p> <ol style="list-style-type: none">1. It is an off season training method but is very useful in developing endurance in athletes.2. It has a psychological advantage over the other training methods because the changing scenes help in delaying fatigue.3. It is the best method to improve endurance in sports where endurance is a basic requirement e.g. cross-country running.4. Balancing adjustments of ankles, knees and thighs improves due to the uneven surface.	1*3=3
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15.	<table border="0" style="width: 100%; text-align: center;"> <thead> <tr> <th style="width: 30%;">Low Score</th> <th style="width: 40%;">Trait</th> <th style="width: 30%;">High Score</th> </tr> </thead> <tbody> <tr> <td style="border: 1px solid gray; border-radius: 15px; padding: 5px;">Practical, conventional, prefers routine</td> <td style="border: 1px solid gray; border-radius: 15px; padding: 5px;">O Openness (imagination, feelings, actions, ideas)</td> <td style="border: 1px solid gray; border-radius: 15px; padding: 5px;">Curious, wide range of interests, independent</td> </tr> <tr> <td style="border: 1px solid gray; border-radius: 15px; padding: 5px;">Impulsive, careless, disorganized</td> <td style="border: 1px solid gray; border-radius: 15px; padding: 5px;">C Conscientiousness (competence, self-discipline, thoughtfulness, goal-driven)</td> <td style="border: 1px solid gray; border-radius: 15px; padding: 5px;">Hardworking, dependable, organized</td> </tr> <tr> <td style="border: 1px solid gray; border-radius: 15px; padding: 5px;">Quiet, reserved, withdrawn</td> <td style="border: 1px solid gray; border-radius: 15px; padding: 5px;">E Extroversion (sociability, assertiveness, emotional expression)</td> <td style="border: 1px solid gray; border-radius: 15px; padding: 5px;">Outgoing, warm, seeks adventure</td> </tr> <tr> <td style="border: 1px solid gray; border-radius: 15px; padding: 5px;">Critical, uncooperative, suspicious</td> <td style="border: 1px solid gray; border-radius: 15px; padding: 5px;">A Agreeableness (cooperative, trustworthy, good-natured)</td> <td style="border: 1px solid gray; border-radius: 15px; padding: 5px;">Helpful, trusting, empathetic</td> </tr> <tr> <td style="border: 1px solid gray; border-radius: 15px; padding: 5px;">Calm, even-tempered, secure</td> <td style="border: 1px solid gray; border-radius: 15px; padding: 5px;">N Neuroticism (tendency toward unstable emotions)</td> <td style="border: 1px solid gray; border-radius: 15px; padding: 5px;">Anxious, unhappy, prone to negative emotions</td> </tr> </tbody> </table>	Low Score	Trait	High Score	Practical, conventional, prefers routine	O Openness (imagination, feelings, actions, ideas)	Curious, wide range of interests, independent	Impulsive, careless, disorganized	C Conscientiousness (competence, self-discipline, thoughtfulness, goal-driven)	Hardworking, dependable, organized	Quiet, reserved, withdrawn	E Extroversion (sociability, assertiveness, emotional expression)	Outgoing, warm, seeks adventure	Critical, uncooperative, suspicious	A Agreeableness (cooperative, trustworthy, good-natured)	Helpful, trusting, empathetic	Calm, even-tempered, secure	N Neuroticism (tendency toward unstable emotions)	Anxious, unhappy, prone to negative emotions	1+3=4
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Critical, uncooperative, suspicious	A Agreeableness (cooperative, trustworthy, good-natured)	Helpful, trusting, empathetic																		
Calm, even-tempered, secure	N Neuroticism (tendency toward unstable emotions)	Anxious, unhappy, prone to negative emotions																		

16.	<p>Fast Twitch Muscle Fibre: The muscle composition is genetically determined and cannot be changed by training. There are three main types of muscle fibers. These are slow-twitch (type I), fast-twitch (type IIa) and fast-twitch (type IIb). Fast twitch fibres are much better at generating short bursts of strength or speed than slow twitch fibre muscles. Thus, the greater the percentage of fast twitch muscle fibre one has, the faster he is.</p> <p>Body Fat: Fat acts as excess baggage when trying to run. Body fat of 6 to 10 percent of body weight for men and 12 to 17 percent of body weight for women is desirable for sprinting short distances. Lower range of body fat is unhealthy whereas higher range of body fat negatively affects speed.</p> <p>Anaerobic Capacity: Speed is dependent on the anaerobic energy systems. Anaerobic capacity is the ability to produce energy without the use of oxygen. Short bursts of speed are anaerobic and are very intensive. Our body can only perform a certain number of quick bursts of speed before we experience the physiological response of pain and fatigue. Thus, an athlete having a better anaerobic capacity will have a better speed.</p> <p>Neuromuscular Responses: Neuromuscular responses affect speed. Faster responses lead to faster muscle contraction thus leading to faster speed.</p> <p>Flexibility: Another important factor contributing to optimum speed is joint flexibility. Good flexibility will help an athlete in maximum range of movement without much effort and resistance. Proper flexibility of the</p>	1*4=4
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	involved joints contributes to movements that are more fluid and coordinated, resulting in longer and faster strides and greater speed. Thus, flexibility plays an important role in determining speed.	
17.	<p>Flexibility can be defined as the maximum range of motion at a joint that is the extent of movement possible about a joint without undue strain. Flexibility is not a general quality; it is specific to a particular joint, such as the knee or to a series of joints. This means that an individual can have a better range of motion in some joints than in others.</p> <p>10.4) Methods to Improve Flexibility</p> <p>I. Ballistic Stretching: The individual performs these stretching exercises while in motion. This dynamic method uses the momentum generated from repeated bouncing movements to stretch the muscles. Although it is very effective, most experts do not recommend this method because it may overstretch the muscles and can cause muscle soreness or injury. This method includes various exercises like swinging the trunk sideways, forward, backward, swinging the legs etc.</p> <p>II. Static Stretching: It is an extremely popular and effective technique. Static stretching involves gently and slowly moving into the stretch position and holding it for a certain period of time. Movement should take place through the full range of motion until a little tension or tightness is felt in the muscles or group of muscles. As the muscle relaxes, the stretch should be extended and held again. Stretching should not be painful. Care must be taken not to force the joint to move too far, which may cause an injury. Stretching should be held from 10 to 30 seconds and a maximum of five repetitions for each exercise.</p> <p>III. Passive stretching: Passive stretching techniques are usually performed with a partner who applies a stretch to a relaxed joint. Partner stretching requires closer communication between partners, and the slow application of the stretch in order to prevent injuries due to forceful manipulation of the body segment.</p> <p>IV. Proprioceptive Neuromuscular Facilitation (PNF) or Contract: PNF technique is the most appropriate method for increasing or developing flexibility in the shortest possible time. This method is used by sportsmen for gaining flexibility. It involves use of muscle contraction before stretching to achieve maximum muscle relaxation. The following procedure is used for PNF technique :</p> <ol style="list-style-type: none"> 1. Move into the stretch position so that the stretch sensation can be felt. 2. The partner holds the limb in this stretched position. 3. Push against your partner for 6 to 10 seconds by contracting the antagonistic muscles and then relax. During contraction, the partner 	1+3=4

	<p>tries to resist any movement of the limb.</p> <p>4. The partner then moves the limb further into the stretch until the stretch sensation is felt.</p> <p>5. Repeat the whole procedure for 4 to 5 times.</p>	
<p>18.</p>	<p>PAWANMUKTASANA</p> <p>Procedure</p> <ol style="list-style-type: none"> 1. Lie on your back with your feet together and arms besides your body and relax, breathing deeply. 2. With a deep inhalation raise your legs to 90° and completely exhale. 3. Now with another inhalation bring both the knees close to your chest and press on the lower abdomen, holding the knees with your hands. Exhale completely. 4. Remain with bent knees for a few breaths. With every exhalation press the thighs and knees on the abdomen and hold them with your hands. 5. With a deep breath raise your head, neck and chest and bring them close to your knees. If possible, bring your chin in between your knees. Ensure the head moves less and the knees come closer to the face. That way the pressure on the abdominal muscles will help in releasing the unwanted gas/wind around the abdominal organs. 6. Remain in this posture for a few breaths focusing on maintaining the position of the head and neck in place. With every exhalation press the thighs closer and deeper into the chest and face deeper into the knees. 7. Try to maintain the balance while breathing slowly and keeping the body relaxed. 8. Now with an inhalation, release the neck and head and exhale completely. With another inhalation straighten the legs and bring them back to 90° and as you exhale release the leg from 90° to the relaxed posture. With complete exhalation, bring the legs stretched out on the floor and relax the neck. 9. Take a few breaths, and then continue with the next round. The longer you hold in this posture the faster the muscles around the abdomen loosen. <p>Contraindications</p> <p>To be avoided or performed under guidance by those suffering from</p> <ol style="list-style-type: none"> 1. severe migraine 2. High or Low Blood Pressure 	<p>2+1+1=4</p>

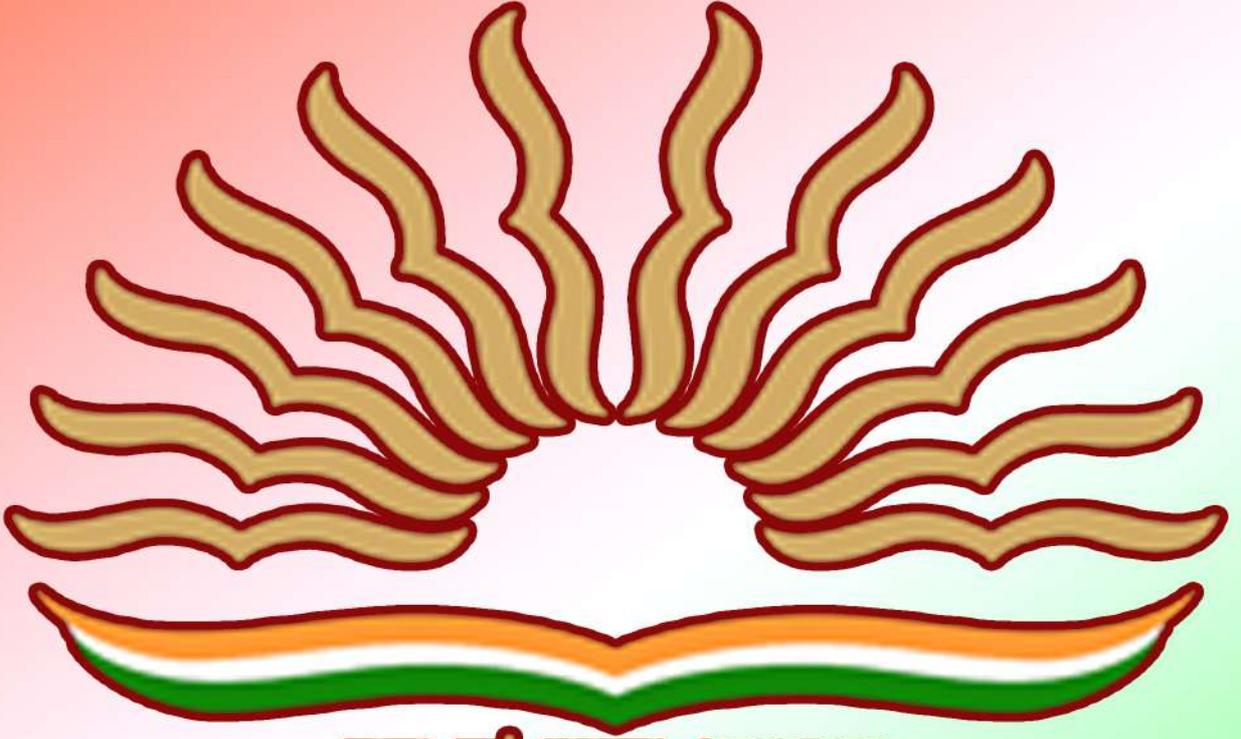
3. Asthma

4. slip disc

5. advanced stages of spondylitis

6. Girls/Women should avoid this asana or take the guidance of the teacher while practicing it during the menstrual cycle.





तत् त्वं पूषन् अपावृणु
केन्द्रीय विद्यालय संगठन

आज़ादी का अमृत महोत्सव