

KENDRIYA VIDYALAYA 'K' AREA ZIRAKPUR
HOME WORK FOR STUDENTS DURING AUTUMN BREAK 2022-23
CLASS XIIA
SUBJECT PHYSICS

1. All students will revise the whole syllabus completed till October 1,2022 for preparation for Preboard-1 Exam
2. Before Pre-Board, Monthly Exam will be conducted at the end of October Month. Most of the Syllabus for that will be Electromagnetic Induction & Alternating Current, Electromagnetic waves and Ray Optics.
3. Chapter wise MCQs are given as mentioned below. Students will write the answers with explanation (in brief) to these MCQs in Physics Homework notebook.
4. Students will complete the Art Integrated Learning Project (emailed to each student), allotted to them. Investigatory Project allotted during summer vacation should also be completed by each student.
5. Students will solve the CBSE Sample paper 2022-23 for the questions till Ray Optics and the Monthly Exam (September Month) and also paste the Question papers in Physics note book.

MAGNETIC EFFECTS OF CURRENT

1. Which has greater resistance?
(a) Milliammeter (b) Ammeter
(c) Depends on use (d) None of these.
2. Through two parallel wires A and B, 10 and 2 amp of currents are passed respectively in opposite directions. if the wire A is infinitely long, the length of the wire B is 2 m the force on the conductor B, which is situated at 10 cm distance from A will be
(a) $8 \times 10^{-5} \text{N}$ (b) $4 \times 10^{-7} \text{N}$
(c) $4 \times 10^{-5} \text{N}$ (d) $8 \times 10^{-7} \text{N}$.
3. A moving coil type of galvanometer is based upon the principle that
(a) Wires carrying a current experiences a force in magnetic field
(b) Wire carrying current produces a magnetic field
(c) It has a horse shoe type magnet
(d) All are true.

4. A voltmeter has a resistance of G ohm and range V volt. The value of resistance used in series to convert it into voltmeter of range nV volt is
- (a) nG (b) $(n - 1)G$
 (c) $\frac{G}{n}$ (d) $\frac{G}{(n-1)}$.
5. The deflection in the galvanometer falls from 50 divisions to 20 when a 12 ohm shunt is applied. The galvanometer resistance is
- (a) 18 ohm (b) 36 ohm
 (c) 24 ohm (d) 30 ohm.
6. A charged particle moves in a uniform magnetic field at right angles to the direction of the field. Which of the following changes?
- (a) Charge of the particle (b) Speed of the particle
 (c) Energy of the particle
 (d) Trajectory of motion of the particle.
7. A galvanometer of resistance 18Ω shows a deflection of 50 divisions. When this galvanometer is shunted with a 12Ω resistance, the deflection shall fall to
- (a) Zero (b) 10 divisions
 (c) 20 divisions (d) 25 divisions.
8. The velocities of two α -particles A and B entering a uniform magnetic field are in the ratio 1:3. On entering the magnetic field, they begin to move in different circular paths. What is the ratio of the radii of curvature of the paths of the particles?
- (a) 3:1 (b) 1:3
 (c) 2:1 (d) 1:2.
9. A very long solenoid has 800 turns per meter length of the solenoid. A current of 1.6A flows through it. Then the magnetic induction at the end of the solenoid on its axis, is nearly
- (a) $32 \times 10^{-4}T$ (b) $16 \times 10^{-4}T$
 (c) $8 \times 10^{-4}T$ (d) $4 \times 10^{-4}T$.
10. A galvanometer gives full scale deflection from a current of one microampere. The resistance to be connected in series with the galvanometer, so that it reads 1 volt for full scale deflection is nearly
- (a) 0.5 mega ohm (b) 1 mega ohm
 (c) 1.5 mega ohm (d) 2 mega ohm.

ELECTROMAGNETIC INDUCTION & ALTERNATING CURRENT

- 1. The primary of a transformer is made with 100 turns of wire while the secondary has 3000 turns. What will the potential difference across each turn of wire in the secondary when the primary is connected to a P.D. of 80 volt A.C.?**
(a) 0.24 volt (b) 0.08 volt
(c) 240 volt (d) 0.8 volt.
- 2. If $E = 0.34 \cos [3000t + 0.74]$ where E and t are in mV and s respectively, then the frequency will be**
 $\frac{1500}{\pi}$
(a) π Hz (b) 3000 Hz
(c) 1.65 Hz (d) 1747.96 Hz.
- 3. In an LCR circuit, the capacitance is made one-fourth, when in resonance, then what should be change in inductance, so that the circuit remains in resonance?**
(a) 4 times (b) 1/4 times
(c) 8 times (d) 2 times.
- 4. The peak value of an alternating current in a 100Ω resistor is 3.0A. The power developed in the resistor is**
(a) 44W (b) 40W
(c) 50W (d) None of these.
- 5. The frequency of D.C. mains in India is**
(a) 50 Hz (b) 60 Hz
(c) 0 Hz (d) 314 Hz.
- 6. What is the coefficient of mutual inductance, when the magnetic flux changes by $2 \times 10^{-2}\text{Wb}$ and change in current is 0.01 A?**
(a) 2 henry (b) 3 henry
(c) 1/2 henry (d) Zero.
- 7. Two similar circular co-axial loops carry equal currents in the same direction. One bringing the loops close together, the current in**
(a) Each loop will decrease
(b) Each loop will increase
(c) Each loop will remain unchanged
(d) One loop will increase and in other loop will decrease.

8. A metal aeroplane having a distance of 50m between the edges of its wings is flying horizontally with a speed of 360 km/hr. At the place of flight, earth's total magnetic field is 4.0×10^{-5} weber/m² and angle of dip is 30°. Find the induced potential difference across the edges of the wings

- (a) 0.01 volt (b) 1.0 volt
(c) 1 milli volt (d) 0.1 volt.

9. A copper rod of length l is rotated about the end perpendicular to the uniform magnetic field B with constant angular velocity ω . The induced emf between the two ends is

- (a) Zero (b) $\frac{B\omega l^2}{8}$
(c) $\frac{1}{2}B\omega l^2$ (d) $\frac{1}{4}B\omega l^2$.

10. A magnet is moved towards coil

- (i) quickly (ii) slowly.

Then the induced emf is

- (a) Larger in case (i) (b) Smaller in case (i)
(c) Equal in both the cases (d) Cannot say.

11. Whenever magnetic flux linked with a circuit changes,

- (a) It is the emf which is induced first in the circuit
(b) It is the current which is induced first in the circuit
(c) Both the emf and current are induced at the same moment
(d) None of the above.

12. Negative sign appearing in Farady's law of electromagnetic induction indicates that

- (a) The induced emf is produced only when magnetic flux decreases
(b) The induced emf is opposite to the direction of magnetic flux
(c) The induced emf is opposes the change in the magnetic flux
(d) None of the above.

13. A solenoid has 1000 turns wound over a length of 0.50m. The area of its cross-section is 1.5×10^{-3} m². Around its central section, a coil of 500 turns is wound. If an initial current of 1A in the solenoid is reversed in 375 micro sec, the mutual inductance between two coils and emf induced in the coil is equal to

- (a) 1.88 mH, 20V (b) 1 mH, 1V
(c) 1.88 mH, 10V (d) 1.88 mH, 5V.

14. A coil of insulated wire is connected in a series with a bulb, a battery and a switch. When the current is completed the bulb lights up immediately. The circuit is

switched off and a rod of soft iron is placed inside the coil. On completing the circuit again, it is observed that

- (a) The bulb is not so bright
- (b) There is a slight delay before the bulb lights to its normal brightness
- (c) The bulb is initially bright but gradually becomes dim
- (d) The bulb is brighter than before.

15. The output voltage of an ideal transformer, connected to a 240V a.c. mains is 24V. When this transformer is used to light a bulb with rating (24V, 24W), calculate the current in the primary coil of the circuit.

- (a) 0.3A
- (b) 0.1A
- (c) 0.8A
- (d) 1.02A

16. A sinusoidal ac current passes through a resistor of resistance R in LCR series circuit which is in resonance. If phase difference between supplied voltage and supplied current is θ and peak value of supplied current is I_0 , then power dissipated in the ckt is :-

- (a) $I_0^2 R \cos \theta$
- (b) $\frac{I_0^2 R}{2}$
- (c) $I_0^2 R$
- (d) $\frac{I_0^2 R}{2} \cos \theta$

17. In a series LCR circuit, resistance $R = 10\Omega$ and the impedance $Z = 20\Omega$. The phase difference between the current and the voltage is

- (a) 30°
- (b) 45°
- (c) 60°
- (d) 90°

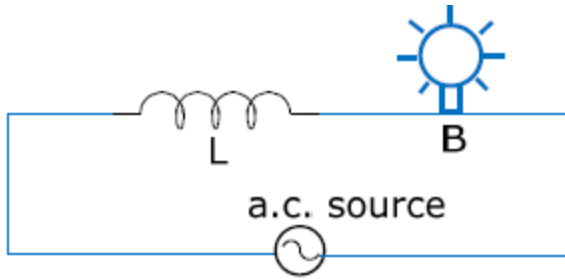
18. What is phase difference between voltage and current in LCR series circuit at resonance?

- (a) 45°
- (b) 30°
- (c) 90°
- (d) 0°

19. In a step-up transformer, turn ratio is 8 : 1. A 60Hz, 120 volt input is connected with its primary coil. Load resistance in secondary coil is $10^4\Omega$. Find current in secondary coil.

- (a) 96 A
- (b) 0.96 A
- (c) 9.6 A
- (d) 96 mA

20. An inductor L of reactance X_L is connected in series with a bulb B to an a.c. source as shown in the figure.



How does the brightness of the bulb change when Number of turns of the inductor is reduced?

- (a) Increases these (b) Decreases (c) Remains same (d) none of these

RAY OPTICS

- Light of wavelength 6000\AA in air enters a medium of refractive index 1.5. What will be its frequency in the medium?
 - a) $6 \times 10^{14}\text{Hz}$ b) $5 \times 10^{14}\text{Hz}$
 - c) $4 \times 10^{14}\text{Hz}$ d) $4 \times 10^{15}\text{Hz}$
- When light undergoes refraction, what happens to its wavelengths?
 - a) changes b) remains same
 - c) always increases d) always decreases
- How does the frequency of a beam of ultraviolet light change when it goes from air into glass?
 - a) no change b) decreases
 - c) increases d) none of these.
- At critical angle what is angle of refraction?
 - a) less than 90° b) greater than 90°
 - c) equal to 90° d) none of these.
- Write the value of the refractive index of liquid in which glass of refractive index 1.5 disappears?
 - a) 1.5 b) 1.2
 - c) 1.3 d) 1.0
- Write the value of the critical angle for a material of refractive index $2^{1/2}$?
 - a) 45° b) 60°
 - c) 50° d) 40°
- What is the relation b/w the critical angle and the refractive index of a material?
 - a) $\mu = \sin C$ b) $\mu \sin C = 1$
 - c) $\mu / \sin C = 1$ d) none of these.

8. For total internal reflection to occur
- $I = C$
 - $I > C$
 - $I < C$
 - $I = 90^\circ$
9. Which of these material has largest refractive index
- air
 - water
 - glass
 - diamond.
10. What should be the position of an object relative to a biconvex lens so that it behaves like a magnifying glass?
- $u > f$
 - $u < f$
 - $u = f$
 - $u = v$
11. SI unit of power of lens is
- cm^{-1}
 - m^{-1}
 - watt
 - Kwatt
12. If the power of lens is +5 dioptr, what is its focal lengths?
- 25 cm
 - 30 cm
 - 20 cm
 - 15 cm
13. Two thin lenses of power of -2.5D. What is the focal length and nature of the lens?
- 40 cm/convex
 - 40 cm/concave
 - 20 cm/ concave
 - 20 cm/convex.
14. An object is held at the principle focus of a concave lens of focal lengths F. Where is the image formed?
- same side
 - opposite side
 - at focus
 - none of these.
15. Three lenses with power 2 D, 3 D and 10 D form a combination. What is its total power?
- 60 D
 - 15 D
 - 50 D
 - 30 D
16. In the position of minimum deviation
- $i > e$
 - $i < e$
 - $I = e$
 - none of these.
17. Dispersion of light is not caused by
- prism
 - water droplets
 - glass slab
 - none of these.
18. Out of red or blue light, for which colour is the refractive of glass is greater?
- red
 - blue
 - same for both
 - none of these.

19. Focal length of convex lens of refractive index 1.5 is 10 cm .if it is immersed in a liquid of refractive index 3, then the focal length of this lens, will be same as.
- Convex lens having focal length 10 cm
 - Concave lens having focal length 10 cm
 - Concave lens having focal length $10/3$ cm
 - Convex lens having focal length 30 cm
20. If the radius of curvature of convex mirror is 40 cm and the size of object is twice as that of the image, then image distance should be
- 10 cm
 - 20 cm
 - 30 cm
 - 40 cm
21. How the power of a convex lens vary, if the incident red light is replaced by violet light?
- Increases
 - decreases
 - no change
 - none of these.
22. The velocity of light is maximum in a medium of:-
- Diamond
 - Water
 - Glass
 - Vacuum
23. A virtual image larger than the object can be obtained by
- concave mirror
 - convex mirror
 - plane mirror
 - concave lens
24. An object is placed 40 cm from a concave mirror of focal length 20 cm. The image formed is
- real, inverted and same in size
 - real, inverted and smaller
 - virtual, erect and larger
 - virtual, erect and smaller
25. For the angle of minimum deviation of a prism to be equal to its refracting angle, the prism must be made of a material whose refractive index
- lies between $\sqrt{2}$ and 1
 - lies between 2 and $\sqrt{2}$
 - is less than 1
 - is greater than 2

SAMPLE PAPER (2022-23)

CHEMISTRY THEORY

(043)

MM:70

Time: 3 hours

General Instructions:

Read the following instructions carefully.

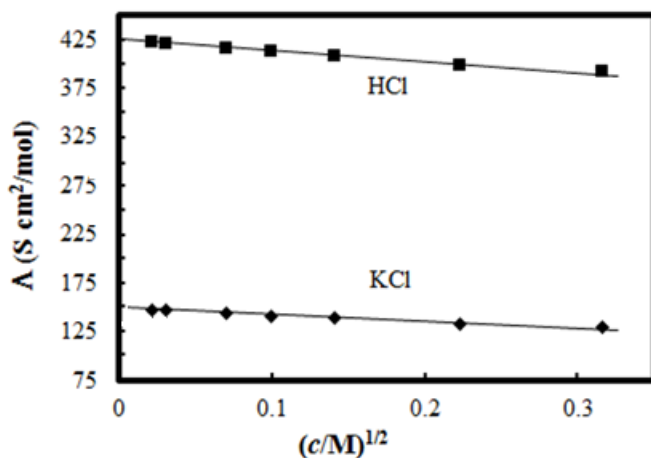
- There are **35** questions in this question paper with internal choice.
- SECTION A consists of 18 multiple-choice questions carrying 1 mark each.
- SECTION B consists of 7 very short answer questions carrying 2 marks each.
- SECTION C consists of 5 short answer questions carrying 3 marks each.
- SECTION D consists of 2 case- based questions carrying 4 marks each.
- SECTION E consists of 3 long answer questions carrying 5 marks each.
- All questions are compulsory.**
- Use of log tables and calculators is not allowed**

SECTION A

The following questions are multiple-choice questions with one correct answer. Each question carries 1 mark. There is no internal choice in this section.

- The major product of acid catalysed dehydration of 1-methylcyclohexanol is:
 - 1-methylcyclohexane
 - 1-methylcyclohexene
 - 1-cyclohexylmethanol
 - 1-methylenecyclohexane
- Which one of the following compounds is more reactive towards S_N1 reaction?
 - $CH_2=CHCH_2Br$
 - $C_6H_5CH_2Br$
 - $C_6H_5CH(C_6H_5)Br$
 - $C_6H_5CH(CH_3)Br$
- $KMnO_4$ is coloured due to:
 - d-d transitions
 - charge transfer from ligand to metal
 - unpaired electrons in d orbital of Mn
 - charge transfer from metal to ligand

4. Which radioactive isotope would have the longer half-life ^{15}O or ^{19}O ? (Given rate constants for ^{15}O and ^{19}O are $5.63 \times 10^{-3} \text{ s}^{-1}$ and $k = 2.38 \times 10^{-2} \text{ s}^{-1}$ respectively.)
- ^{15}O
 - ^{19}O
 - Both will have the same half-life
 - None of the above, information given is insufficient
5. The molar conductivity of CH_3COOH at infinite dilution is $390 \text{ Scm}^2/\text{mol}$. Using the graph and given information, the molar conductivity of CH_3COOK will be:



- $100 \text{ Scm}^2/\text{mol}$
- $115 \text{ Scm}^2/\text{mol}$
- $150 \text{ Scm}^2/\text{mol}$
- $125 \text{ Scm}^2/\text{mol}$

***FOR VISUALLY CHALLENGED LEARNERS**

- *5. What is the molar conductance at infinite dilution for sodium chloride if the molar conductance at infinite dilution of Na^+ and Cl^- ions are $51.12 \times 10^{-4} \text{ Scm}^2/\text{mol}$ and $73.54 \times 10^{-4} \text{ Scm}^2/\text{mol}$ respectively?
- $124.66 \text{ Scm}^2/\text{mol}$
 - $22.42 \text{ Scm}^2/\text{mol}$
 - $198.20 \text{ Scm}^2/\text{mol}$
 - $175.78 \text{ Scm}^2/\text{mol}$

6. For the reaction, $A + 2B \rightarrow AB_2$, the order w.r.t. reactant A is 2 and w.r.t. reactant B. What will be change in rate of reaction if the concentration of A is doubled and B is halved?

- a. increases four times
- b. decreases four times
- c. increases two times
- d. no change

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

A : Butanamine, B: N,N-Dimethylethanamine, C: N- Ethylethanaminamine

- a. $C < B < A$
- b. $A < B < C$
- c. $A < C < B$
- d. $B < C < A$

8. The CFSE of $[\text{CoCl}_6]^{3-}$ is 18000 cm^{-1} the CFSE for $[\text{CoCl}_4]^-$ will be:

- a. 18000 cm^{-1}
- b. 8000 cm^{-1}
- c. 2000 cm^{-1}
- d. 16000 cm^{-1}

9. What would be the major product of the following reaction?



- a. $\text{A} = \text{C}_6\text{H}_5\text{CH}_2\text{OH}$, $\text{B} = \text{C}_6\text{H}_6$
- b. $\text{A} = \text{C}_6\text{H}_5\text{CH}_2\text{OH}$, $\text{B} = \text{C}_6\text{H}_5\text{Br}$
- c. $\text{A} = \text{C}_6\text{H}_5\text{CH}_3$, $\text{B} = \text{C}_6\text{H}_5\text{Br}$
- d. $\text{A} = \text{C}_6\text{H}_5\text{CH}_2\text{Br}$, $\text{B} = \text{C}_6\text{H}_5\text{OH}$

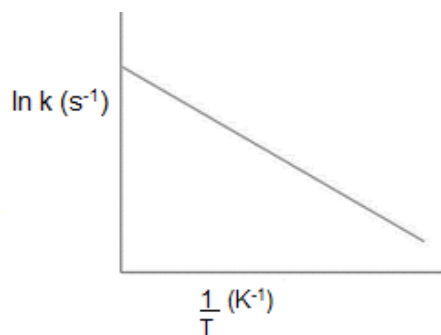
10. Which of the following statements is not correct for amines?

- a. Most alkyl amines are more basic than ammonia solution.
- b. pK_b value of ethylamine is lower than benzylamine.
- c. CH_3NH_2 on reaction with nitrous acid releases NO_2 gas.
- d. Hinsberg's reagent reacts with secondary amines to form sulphonamides.

11. Which of the following tests/ reactions is given by aldehydes as well as ketones?

- a. Fehling's test
- b. Tollen's test
- c. 2,4 DNP test
- d. Cannizzaro reaction

12. Arrhenius equation can be represented graphically as follows:

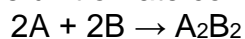


The (i) intercept and (ii) slope of the graph are:

- a. (i) $\ln A$ (ii) E_a/R
- b. (i) A (ii) E_a
- c. (i) $\ln A$ (ii) $-E_a/R$
- d. (i) A (ii) $-E_a$

***FOR VISUALLY CHALLENGED LEARNERS**

*12. The unit of rate constant for the reaction



which has rate = $k [A]^2[B]$ is:

- a. $\text{mol L}^{-1}\text{s}^{-1}$
- b. s^{-1}
- c. mol L^{-1}
- d. $\text{mol}^{-2} \text{L}^2 \text{s}^{-1}$

13. The number of ions formed on dissolving one molecule of $\text{FeSO}_4 \cdot (\text{NH}_4)_2\text{SO}_4 \cdot 6\text{H}_2\text{O}$ in water is:

- a. 3
- b. 4
- c. 5
- d. 6

14. The oxidation of toluene to benzaldehyde by chromyl chloride is called

- a. Etard reaction
- b. Riemer-Tiemann reaction
- c. Stephen's reaction
- d. Cannizzaro's reaction

15. Given below are two statements labelled as Assertion (A) and Reason (R)

Assertion (A): An ether is more volatile than an alcohol of comparable molecular mass.

Reason (R): Ethers are polar in nature.

Select the most appropriate answer from the options given below:

- Both A and R are true and R is the correct explanation of A
- Both A and R are true but R is not the correct explanation of A.
- A is true but R is false.
- A is false but R is true.

16. Given below are two statements labelled as Assertion (A) and Reason (R)

Assertion (A): Proteins are found to have two different types of secondary structures viz alpha-helix and beta-pleated sheet structure.

Reason (R): The secondary structure of proteins is stabilized by hydrogen bonding.

Select the most appropriate answer from the options given below:

- Both A and R are true and R is the correct explanation of A
- Both A and R are true but R is not the correct explanation of A.
- A is true but R is false.
- A is false but R is true.

17. Given below are two statements labelled as Assertion (A) and Reason (R)

Assertion : Magnetic moment values of actinides are lesser than the theoretically predicted values.

Reason : Actinide elements are strongly paramagnetic.

Select the most appropriate answer from the options given below:

- Both A and R are true and R is the correct explanation of A
- Both A and R are true but R is not the correct explanation of A.
- A is true but R is false.
- A is false but R is true.

18. Given below are two statements labelled as Assertion (A) and Reason (R)

Assertion (A): Tertiary amines are more basic than corresponding secondary and primary amines in gaseous state.

Reason (R): Tertiary amines have three alkyl groups which cause +I effect.

Select the most appropriate answer from the options given below:

- Both A and R are true and R is the correct explanation of A
- Both A and R are true but R is not the correct explanation of A.
- A is true but R is false.
- A is false but R is true.

SECTION B

This section contains 7 questions with internal choice in two questions. The following questions are very short answer type and carry 2 marks each.

19. A first-order reaction takes 69.3 min for 50% completion. What is the time needed for 80% of the reaction to get completed?

(Given: $\log 5 = 0.6990$, $\log 8 = 0.9030$, $\log 2 = 0.3010$)

20. Account for the following:

- There are 5 OH groups in glucose
- Glucose is a reducing sugar

OR

What happens when D – glucose is treated with the following reagents

- Bromine water
- HNO_3

21. Give reason for the following:

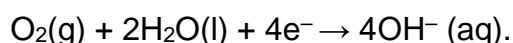
- During the electrophilic substitution reaction of haloarenes, para substituted derivative is the major product.
- The product formed during $\text{S}_{\text{N}}1$ reaction is a racemic mixture.

OR

- Name the suitable alcohol and reagent, from which 2-Chloro-2-methyl propane can be prepared.
- Out of the Chloromethane and Fluoromethane, which one has higher dipole moment and why?

22. The formula $\text{Co}(\text{NH}_3)_5\text{CO}_3\text{Cl}$ could represent a carbonate or a chloride. Write the structures and names of possible isomers.

23. Corrosion is an electrochemical phenomenon. The oxygen in moist air reacts as follows:



Write down the possible reactions for corrosion of zinc occurring at anode, cathode, and overall reaction to form a white layer of zinc hydroxide.

24. Explain how and why will the rate of reaction for a given reaction be affected when

- a catalyst is added
- the temperature at which the reaction was taking place is decreased

25. Write the reaction and IUPAC name of the product formed when 2-Methylpropanal (isobutyraldehyde) is treated with ethyl magnesium bromide followed by hydrolysis.

SECTION C

This section contains 5 questions with internal choice in two questions. The following questions are short answer type and carry 3 marks each.

26. Write the equations for the following reaction:

- Salicylic acid is treated with acetic anhydride in the presence of conc. H_2SO_4
- Tert butyl chloride is treated with sodium ethoxide.
- Phenol is treated with chloroform in the presence of NaOH

27. Using Valence bond theory, explain the following in relation to the paramagnetic complex $[\text{Mn}(\text{CN})_6]^{3-}$

- type of hybridization
- magnetic moment value
- type of complex – inner, outer orbital complex

28. Answer the following questions:

- State Henry's law and explain why are the tanks used by scuba divers filled with air diluted with helium (11.7% helium, 56.2% nitrogen and 32.1% oxygen)?
- Assume that argon exerts a partial pressure of 6 bar. Calculate the solubility of argon gas in water. (Given Henry's law constant for argon dissolved in water, $K_H = 40\text{kbar}$)

29. Give reasons for **any 3** of the following observations:

- Aniline is acetylated before nitration reaction.
- $\text{p}K_b$ of aniline is lower than the m-nitroaniline.
- Primary amine on treatment with benzenesulphonyl chloride forms a product which is soluble in NaOH however secondary amine gives product which is insoluble in NaOH.
- Aniline does not react with methyl chloride in the presence of anhydrous AlCl_3 catalyst.

- 30.
- Identify the major product formed when 2-cyclohexylchloroethane undergoes a dehydrohalogenation reaction. Name the reagent which is used to carry out the reaction.
 - Why are haloalkanes more reactive towards nucleophilic substitution reactions than haloarenes and vinylic halides?

OR

- Name the possible alkenes which will yield 1-chloro-1-methylcyclohexane on their reaction with HCl. Write the reactions involved.
- Allyl chloride is hydrolysed more readily than n-propyl chloride. Why?

SECTION D

The following questions are case-based questions. Each question has an internal choice and carries 4 (1+1+2) marks each. Read the passage carefully and answer the questions that follow.

31. **Strengthening the Foundation: Chargaff Formulates His "Rules"**

Many people believe that James Watson and Francis Crick discovered DNA in the 1950s. In reality, this is not the case. Rather, DNA was first identified in the late 1860s by Swiss chemist Friedrich Miescher. Then, in the decades following Miescher's discovery, other scientists--notably, Phoebus Levene and Erwin Chargaff--carried out a series of research efforts that revealed additional details about the DNA molecule, including its primary chemical components and the ways in which they joined with one another. Without the scientific foundation provided by these pioneers, Watson and Crick may never have reached their groundbreaking conclusion of 1953: that the DNA molecule exists in the form of a three-dimensional double helix.

Chargaff, an Austrian biochemist, as his first step in this DNA research, set out to see whether there were any differences in DNA among different species. After developing a new paper chromatography method for separating and identifying small amounts of organic material, Chargaff reached two major conclusions:

- (i) the nucleotide composition of DNA varies among species.
- (ii) Almost all DNA, no matter what organism or tissue type it comes from maintains certain properties, even as its composition varies. In particular, the amount of adenine (A) is similar to the amount of thymine (T), and the amount of guanine (G) approximates the amount of cytosine (C). In other words, the total amount of purines (A + G) and the total amount of pyrimidines (C + T) are usually nearly equal. This conclusion is now known as "Chargaff's rule."

Chargaff's rule is not obeyed in some viruses. These either have single- stranded DNA or RNA as their genetic material.

Answer the following questions:

- a. A segment of DNA has 100 adenine and 150 cytosine bases. What is the total number of nucleotides present in this segment of DNA?
- b. A sample of hair and blood was found at two sites. Scientists claim that the samples belong to same species. How did the scientists arrive at this conclusion?
- c. The sample of a virus was tested and it was found to contain 20% adenine, 20% thymine, 20 % guanine and the rest cytosine. Is the genetic material of this virus (a) DNA- double helix (b) DNA-single helix (c) RNA? What do you infer from this data?

OR

How can Chargaff's rule be used to infer that the genetic material of an organism is double- helix or single- helix?

32. Henna is investigating the melting point of different salt solutions. She makes a salt solution using 10 mL of water with a known mass of NaCl salt. She puts the salt solution into a freezer and leaves it to freeze. She takes the frozen salt solution out of the freezer and measures the temperature when the frozen salt solution melts. She repeats each experiment.

| S.No | Mass of the salt used in g | Melting point in °C | |
|------|----------------------------|---------------------|---------------|
| | | Readings Set 1 | Reading Set 2 |
| 1 | 0.3 | -1.9 | -1.9 |
| 2 | 0.4 | -2.5 | -2.6 |
| 3 | 0.5 | -3.0 | -5.5 |
| 4 | 0.6 | -3.8 | -3.8 |
| 5 | 0.8 | -5.1 | -5.0 |
| 6 | 1.0 | -6.4 | -6.3 |

Assuming the melting point of pure water as 0°C, answer the following questions:

- One temperature in the second set of results does not fit the pattern. Which temperature is that? Justify your answer.
- Why did Henna collect two sets of results?
- In place of NaCl, if Henna had used glucose, what would have been the melting point of the solution with 0.6 g glucose in it?

OR

What is the predicted melting point if 1.2 g of salt is added to 10 mL of water? Justify your answer.

SECTION E

The following questions are long answer type and carry 5 marks each. Two questions have an internal choice.

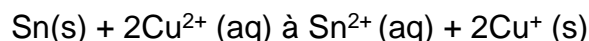
33. a. Why does the cell voltage of a mercury cell remain constant during its

lifetime?

- b. Write the reaction occurring at anode and cathode and the products of electrolysis of aq KCl.
- c. What is the pH of HCl solution when the hydrogen gas electrode shows a potential of -0.59 V at standard temperature and pressure?

OR

- a. Molar conductivity of substance "A" is 5.9×10^3 S/m and "B" is 1×10^{-16} S/m. Which of the two is most likely to be copper metal and why?
- b. What is the quantity of electricity in Coulombs required to produce 4.8 g of Mg from molten MgCl_2 ? How much Ca will be produced if the same amount of electricity was passed through molten CaCl_2 ? (Atomic mass of Mg = 24 u, atomic mass of Ca = 40 u).
- c. What is the standard free energy change for the following reaction at room temperature? Is the reaction spontaneous?



34. A hydrocarbon (A) with molecular formula C_5H_{10} on ozonolysis gives two products (B) and (C). Both (B) and (C) give a yellow precipitate when heated with iodine in presence of NaOH while only (B) give a silver mirror on reaction with Tollen's reagent.
- a. Identify (A), (B) and (C).
 - b. Write the reaction of B with Tollen's reagent
 - c. Write the equation for iodoform test for C
 - d. Write down the equation for aldol condensation reaction of B and C.

OR

An organic compound (A) with molecular formula $\text{C}_2\text{Cl}_3\text{O}_2\text{H}$ is obtained when (B) reacts with Red P and Cl_2 . The organic compound (B) can be obtained on the reaction of methyl magnesium chloride with dry ice followed by acid hydrolysis.

- a. Identify A and B
 - b. Write down the reaction for the formation of A from B. What is this reaction called?
 - c. Give any one method by which organic compound B can be prepared from its corresponding acid chloride.
 - d. Which will be the more acidic compound (A) or (B)? Why?
 - e. Write down the reaction to prepare methane from the compound (B).
35. Answer the following:
- a. Why are all copper halides known except that copper iodide?
 - b. Why is the $E^\circ_{(\text{V}^{3+}/\text{V}^{2+})}$ value for vanadium comparatively low?
 - c. Why HCl should not be used for potassium permanganate titrations?

- d. Explain the observation, at the end of each period, there is a slight increase in the atomic radius of d block elements.
- e. What is the effect of pH on dichromate ion solution?

KENDRIYA VIDYALAYA K AREA ZIRAKPUR

AUTMN BREAK (2022-23) HOMEWORK

CLASS: XII

SUBJECT : MATHEMATICS

INSTRUCTIONS: Do all these questions in a separate file (A-4 sheets)

CONTINUITY AND DIFFRENTIABILITY

1. For what value of k is the following function continuous at $x = 2$?

$$f(x) = \begin{cases} 2x + 1; & x < 2 \\ k; & x = 2 \\ 3x - 1; & x > 2 \end{cases}$$

2. If $f(x) = \begin{cases} 3ax + b, & \text{if } x > 1 \\ 11 & \text{if } x = 1, \text{ continuous at } x = 1, \text{ find the values of } a \text{ and } b. \\ 5ax - 2b, & \text{if } x < 1 \end{cases}$

3. If $f(x)$, defined by the following is continuous at $x = 0$, find the values of a, b, c

$$f(x) = \begin{cases} \frac{\sin(a+1)x + \sin x}{x}, & x < 0 \\ c, & x = 0 \\ \frac{\sqrt{x + bx^2} - \sqrt{x}}{bx^{3/2}}, & x > 0 \end{cases}$$

4. If $x = a \left(\cos \theta + \log \tan \frac{\theta}{2} \right)$ and $y = a \sin \theta$ find $\frac{dy}{dx}$ at $\theta = \frac{\pi}{4}$.

5. If $y = (\log x)^{\cos x} + \frac{x^2 + 1}{x^2 - 1}$, find $\frac{dy}{dx}$.

6. If $xy + y^2 = \tan x + y$, find $\frac{dy}{dx}$.

7. If $y = \sqrt{x^2 + 1} - \log \left(\frac{1}{x} + \sqrt{1 + \frac{1}{x^2}} \right)$, find $\frac{dy}{dx}$.

8. If $\sqrt{1-x^2} + \sqrt{1-y^2} = a(x-y)$, prove that $\frac{dy}{dx} = \sqrt{\frac{1-y^2}{1-x^2}}$.

9. Find $\frac{dy}{dx}$ if $(\cos x)^y = (\cos y)^x$

10. If $x^p \cdot y^q = (x+y)^{p+q}$, prove that $\frac{dy}{dx} = \frac{y}{x}$.

APPLICATIONS OF DERIVATIVES

- 1) Find the point on the curve $y^2 = 8x$ for which the abscissa and ordinate change at the same rate?
- 2) A man 2 metre high walks at a uniform speed of 6km /h away from a lamp post 6 metre high. Find the rate at which the length of his shadow increases. Also find the rate at which the tip of the shadow is moving away from the lamp post.
- 3) A ladder 5m long is leaning against a wall. Bottom of ladder is pulled along the ground away from wall at the rate of 2m/s. How fast is the height on the wall decreasing when the foot of ladder is 4m away from the wall?
- 4) A particle moves along the curve $6y = x^3 + 2$. Find the points on the curve at which y-coordinate is changing 8 times as fast as the x-coordinate.
- 5) Water is leaking from a conical funnel at the rate of $5 \text{ cm}^3/\text{sec}$. If the radius of the base of the funnel is 10 cm and altitude is 20 cm, Find the rate at which water level is dropping when it is 5 cm from top.
- 6) Find the intervals in which the function $f(x) = \sin x - \cos x$, $0 < x < 2\pi$ is increasing or decreasing.
- 7) Show that the function $f(x) = \frac{\sin x}{x}$ is strictly decreasing on $(0, \pi/2)$
- 8) Find the intervals in which the function $f(x) = \frac{\log x}{x}$ increasing or decreasing.
- 9) Find the interval in which the function $f(x) = 2x^3 + 9x^2 + 12x + 20$ is (i) increasing (ii) decreasing
- 10) Find the interval in which the function $f(x) = (x+1)^3(x-1)^3$
- 11) Show that the height of cylinder of maximum volume that can be inscribed in a sphere of radius R is $\frac{2R}{\sqrt{3}}$.
- 12) Show that the semivertical angle of a cone of maximum volume and of given slant height is $\tan^{-1} \sqrt{2}$.
- 13) Length of three sides of a trapezium other than base is equal to 10cm each, then find the area of the trapezium when it is maximum ?
- 14) Find the point on the curve $y^2 = 2x$ which is at minimum distance from the point (1,4)
- 15) An open box with a square base is to be made out of a given quantity of card board of area c^2 square units. Show that the maximum volume of the box is $\frac{c^3}{6\sqrt{3}}$ cubic units.
- 16) A window is in the shape of a rectangle surmounted by an equilateral triangle. If the perimeter of the window is 12 m, find the dimensions of the rectangle that will produce the largest area of the window.

DEFINITE INTEGRALS

$$1. \int_0^{\pi/2} \frac{\sqrt{\tan x}}{1 + \sqrt{\tan x}} dx$$

$$2. \int_1^3 \frac{\sqrt{4-x}}{\sqrt{x} + \sqrt{4-x}} dx$$

$$3. \int_0^{\pi/2} \frac{\sin^4 x}{\sin^4 x + \cos^4 x} dx$$

$$4. \int_0^{\pi/2} \frac{x}{\sin x + \cos x} dx$$

$$5. \int_0^{\pi} \frac{x \sin x}{1 + \cos^2 x} dx$$

$$6. \int_0^{\pi} \frac{x \tan x}{\sec x \cdot \operatorname{cosec} x} dx$$

$$7. \int_{\pi/6}^{\pi/3} \frac{dx}{1 + \sqrt{\tan x}}$$

$$8. \int_0^{\pi} \frac{x}{1 + \sin x} dx$$

$$9. \int_0^{\pi} \frac{x + \sin x}{1 + \cos x} dx$$

$$10. \int_0^{\pi/4} \log(1 + \tan x) dx$$

$$11. \int_0^4 (|x| + |x-2| + |x-4|) dx \text{ (CBSE-2013)}$$

$$12. \int_2^5 (|x-2| + |x-3| + |x-4|) dx$$

APPLICATIONS OF INTEGRATION

1. Find the area of the region included between the parabola $y^2 = x$ and the line $x + y = 2$.
2. Find the area of the region bounded by $x^2 = 4y$, $y = 2$, $y = 4$ and the y -axis in the first quadrant.
3. Using integration compute the area of the region bounded by the triangle whose vertices are $(2, 1)$, $(3, 4)$, and $(5, 2)$.
4. Using integration compute the area of the region bounded by the triangle whose vertices are $(-1, 1)$, $(0, 5)$, and $(3, 2)$.
5. Using integration compute the area of the region bounded by the lines $x + 2y = 2$, $y - x = 1$, and $2x + y = 7$.
6. Using the method of integration find the area of the region bounded by the lines: $2x + y = 4$, $3x - 2y = 6$ and $x - 3y + 5 = 0$.

केन्द्रीय विद्यालय के एरिया

जीरकपुर

कक्षा 12 हिंदी

शरदावकाश गृहकार्य

1. पाठ शिरीष के फूल के प्रश्नोत्तर लिखें तथा सितम्बर माह में पढ़े गए सभी पाठ अच्छी तरह याद करें।
2. सितम्बर माह की मासिक परीक्षा का प्रश्न पत्र अपनी अभ्यास पुस्तिका में हल करें।
3. अध्यापक द्वारा भेजे गए कक्षा 12 के प्रश्न पत्र को हल करें।
4. कला समेकित परियोजना कार्य को पूरा करें।

KENDRIYA VIDYALAYA 'K' AREA ZIRAKPUR
HOLIDAY HOMEWORK 2022-23(AUTUMN BREAK)

CLASS- XII

BIOLOGY

1- Complete the practical file, write core experiments and spotting from lab manual.

2- Make “investigatory project” with following heading in it.

First page- topic, submitted to/submitted by

- Certificate
- Acknowledgment
- Contents
- Introduction
- Theory
- Observation
- Conclusion
- Bibliography

3. Solve question paper of monthly test (only those questions which were incorrect) in your biology notebook.

4. Make art integrated project.

5. All the students are required to revise the syllabus covered for preboard exams thoroughly.

ASSIGNMENT

| Q.NO | Section A | M M |
|-------------|---|----------------|
| 1 | A dicotyledonous plant bears flowers but never produces fruits and seeds. The most probable cause for the above situation is (a) Plant is dioecious and bears only pistillate flowers (b) Plant is dioecious and bears both pistillate and staminate flowers (c) Plant is monoecious (d) Plant is dioecious and bears only staminate flowers. | |
| 2 | During microsporogenesis, meiosis occurs in (a) Endothecium (b) Microspore mother cells (c) Microspore tetrads (d) Pollen grains | |
| 3 | From among the situations given below, choose the one that prevents both autogamy and geitonogamy. (a) Monoecious plant bearing unisexual flowers | |

| | | | | | | | | | | | | | | | | | | |
|-----------|---|-----------|--|----|---|-----------|-----------------|-----|--|-----------|------------------------|------|--|-----------|---------------------|-----|-----------------------------------|--|
| | <p>(b) Dioecious plant bearing only male or female flowers (c) Monoecious plant with bisexual flowers (d) Dioecious plant with bisexual flowers</p> | | | | | | | | | | | | | | | | | |
| 4 | <p>Match the following and choose the correct options:</p> <table border="1" style="margin-left: 20px;"> <tr> <td style="text-align: center;">A.</td> <td style="text-align: center;">Trophoblast</td> <td style="text-align: center;">i.</td> <td style="text-align: center;">Embedding of blastocyst in the endometrium</td> </tr> <tr> <td style="text-align: center;">B.</td> <td style="text-align: center;">Cleavage</td> <td style="text-align: center;">ii.</td> <td style="text-align: center;">Group of cells that would differentiate as embryo</td> </tr> <tr> <td style="text-align: center;">C.</td> <td style="text-align: center;">Inner cell mass</td> <td style="text-align: center;">iii.</td> <td style="text-align: center;">Outer layer of blastocyst attached to the endometrium</td> </tr> <tr> <td style="text-align: center;">D.</td> <td style="text-align: center;">Implantation</td> <td style="text-align: center;">iv.</td> <td style="text-align: center;">Mitotic division of zygote</td> </tr> </table> <p>Options: (a) A—ii, B—i, C—iii, D—iv (b) A—iii, B—iv, C—ii, D—i (c) A—iii, B—i, C—ii, D—iv (d) A—ii, B—iv, C—iii, D—i</p> | A. | Trophoblast | i. | Embedding of blastocyst in the endometrium | B. | Cleavage | ii. | Group of cells that would differentiate as embryo | C. | Inner cell mass | iii. | Outer layer of blastocyst attached to the endometrium | D. | Implantation | iv. | Mitotic division of zygote | |
| A. | Trophoblast | i. | Embedding of blastocyst in the endometrium | | | | | | | | | | | | | | | |
| B. | Cleavage | ii. | Group of cells that would differentiate as embryo | | | | | | | | | | | | | | | |
| C. | Inner cell mass | iii. | Outer layer of blastocyst attached to the endometrium | | | | | | | | | | | | | | | |
| D. | Implantation | iv. | Mitotic division of zygote | | | | | | | | | | | | | | | |
| 5 | <p>The membranous cover of the ovum at ovulation is (a) Corona radiata (b) Zonaradiata (c) Zona pellucida (d) Chorion</p> | | | | | | | | | | | | | | | | | |
| 6 | <p>Urethral meatus refers to the (a) Urinogenital duct (b) Opening of vas deferens into urethra (c) External opening of the urinogenital duct (d) Muscles surrounding the urinogenital duct</p> | | | | | | | | | | | | | | | | | |
| 7 | <p>Condoms are one of the most popular contraceptives because of the following reasons: (a) These are effective barriers for insemination (b) They do not interfere with coital act (c) These help in reducing the risk of STDs (d) All of the above</p> | | | | | | | | | | | | | | | | | |
| 8 | <p>Emergency contraceptives are effective if used within (a) 72 hrs of coitus (b) 72 hrs of ovulation (c) 72 hrs of menstruation (d) 72 hrs of implantation</p> | | | | | | | | | | | | | | | | | |
| 9 | <p>Choose the correct statement regarding the ZIFT procedure: (a) Ova collected from a female donor are transferred to the fallopian tube to facilitate zygote formation. (b) Zygote is collected from a female donor and transferred to the fallopian tube (c) Zygote is collected from a female donor and transferred to the uterus</p> | | | | | | | | | | | | | | | | | |

| | | |
|----|--|--|
| | (d) Ova collected from a female donor and transferred to the uterus | |
| 10 | If a genetic disease is transferred from a phenotypically normal but carrier female to only some of the male progeny, the disease is (a) Autosomal dominant (b) Autosomal recessive (c) Sex-linked dominant (d) Sex-linked recessive | |
| 11 | ZZ/ZW type of sex determination is seen in (a) Platypus (b) Snails (c) Cockroach (d) Peacock | |
| 12 | It is an Autosomal disorder that is caused by the trisomy of 21st chromosome a) Turner's syndrome b) Edward syndrome c) Klinefelter's syndrome d) Down's syndrome | |
| 13 | A nucleoside differs from a nucleotide. It lacks the (a) Base (b) Sugar (c) Phosphate group (d) Hydroxyl group | |
| 14 | In a DNA strand the nucleotides are linked together by (a) Glycosidic bonds (b) Phosphodiester bonds (c) Peptide bonds (d) Hydrogen bonds | |
| 15 | 7. Which of the following statements is the most appropriate for sickle cell anaemia? (a) It cannot be treated with iron supplements (b) It is a genetic disorder. (c) It confers resistance to acquiring malaria (d) All of the above | |
| 16 | The first genetic material could be (a) Protein (b) Carbohydrates (c) DNA (d) RNA | |
| 17 | Starting from the innermost part, the correct sequence of parts in an ovule are (a) Egg, nucellus, embryo sac, integument. (b) Egg, embryo sac, nucellus, integument. (c) Embryo sac, nucellus, integument, egg | |

| | | |
|----|--|-----|
| | (d) Egg, integument, embryo sac, nucellus | |
| 18 | <p>From the statements given below, choose the option that are true for a typical female gametophyte of a flowering plant.</p> <p>i. It is 8-nucleate and 7-celled at maturity ii. It is free-nuclear during the development iii. It is situated inside the integument but outside the nucellus iv. It has an egg apparatus situated at the chalazal end</p> <p>(a) i and iv (b) ii and iii (c) i and ii (d) ii and iv</p> | |
| 19 | <p>Identify the correct statement from the following:</p> <p>(a) High levels of estrogen triggers the ovulatory' surge (b) Oogonial cells start to proliferate and give rise to functional ova in regular cycles from puberty onwards. (c) Sperms released from seminiferous tubules are highly motile. (d) Progesterone level is high during the post ovulatory phase of menstrual cycle.</p> | |
| 20 | <p>Seminal plasma, the fluid part of semen, is contributed by</p> <p>i. Seminal vesicle ii. Prostate iii. Urethra iv. Bulbourethral gland</p> <p>(a) i and ii (b) i, ii and iv (c) ii, iii and iv (d) i and iv</p> | |
| 21 | <p>A cross between two tall plants resulted in offspring having few dwarf plants. What would be the genotypes of both the parents?</p> <p>(a) TT and Tt (b) Tt and Tt (c) TT and TT (d) Tt and tt</p> | |
| 22 | <p>Mendel's Law of independent assortment holds good for genes situated on the</p> <p>(a) non-homologous chromosomes (b) Homologous chromosomes (c) Extra nuclear genetic element (d) Same chromosome.</p> | 0.7 |
| 23 | <p>The RNA polymerase holoenzyme transcribes</p> <p>(a) The promoter, structural gene and the terminator region (b) The promoter and the terminator region (c) The structural gene and the terminator regions (d) The structural gene only</p> | |

| | | |
|------------------|---|--|
| 24 | <p>If Meselson and Stahl's experiment is continued for third generations in bacteria, the ratio of $^{15}\text{N}/^{15}\text{N}$: $^{15}\text{N}/^{14}\text{N}$: $^{14}\text{N}/^{14}\text{N}$ containing DNA in the generation would be</p> <p>(a) 1: 1: 0 (b) 1: 4: 0 (c) 0:1:3 (d) 0:1:7</p> | |
| Section B | | |
| | <p>Read the Assertion and Reason carefully to mark the correct option out of the options given below:</p> <p>(a) If both the Assertion and the Reason are true and the Reason is a correct explanation of the Assertion. (b) If both the Assertion and Reason are true but the Reason is not a correct explanation of the Assertion (c) If the Assertion is true but the Reason is false. (d) If both the Assertion and Reason are false</p> | |
| 25 | <p>Assertion: Viruses having shorter life span, mutate and evolve faster. Reason: Viruses have generally RNA genome.</p> | |
| 26 | <p>Assertion: Ribosomal RNA is synthesized in the cytoplasm of the cell. Reason: It is translated with the enzyme RNA polymerase III.</p> | |
| 27 | <p>Assertion: Sickle-cell anaemia is a genetically determined disorder affecting many new born babies. Reason: It is caused by heterozygosity for allele HbS producing a single amino acid substitution in the α-chain of the normal haemoglobin molecule determined by allele HbA .</p> | |
| 28 | <p>Assertion: The persons with Klinefelter syndrome are sterile males. Reason: Klinefelter syndrome is due to trisomy.</p> | |
| 29 | <p>The phenomenon observed in some plants wherein parts of the sexual apparatus is used for forming embryos without fertilisation is called</p> <p>(a) Parthenocarpy (b) Apomixis (c) Vegetative propagation (d) Sexual reproduction</p> | |
| 30 | <p>In a flower, if the megaspore mother cell forms megaspores without undergoing meiosis and if one of the megaspores develops into an embryo sac, its nuclei would be</p> <p>(a) Haploid (b) Diploid (c) A few haploid and a few diploid (d) With varying ploidy</p> | |
| 31 | <p>Which of the following hormones is not secreted by human placenta?</p> <p>(a) hCG (b) Oestrogens (c) Progesterone (d) LH</p> | |
| 32 | <p>Which among the following has 23 chromosomes?</p> <p>(a) Spermatogonia</p> | |

- (b) Zygote
- (c) Secondary oocyte
- (d) Oogonia

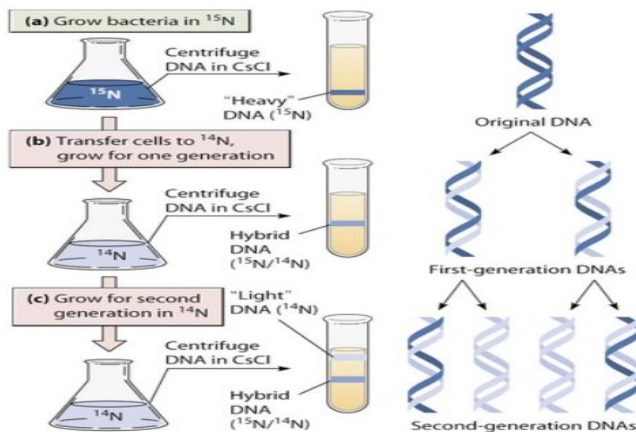
33 Match between the following representing parts of the sperm and their functions and choose the correct option.

| Column A | | Column B | |
|----------|--------------|----------|------------------|
| A. | Head | i. | Enzymes |
| B. | Middle piece | ii. | Sperm motility |
| C. | Acrosome | iii. | Energy |
| D. | Tail | iv. | Genetic material |

Options:

- (a) A—ii, B—iv, C—i, D—iii
- (b) A—iv, B—iii, C—i, D—ii
- (c) A—iv, B—i, C—ii, D—iii
- (d) A—ii, B—i, C—iii, D—iv

34



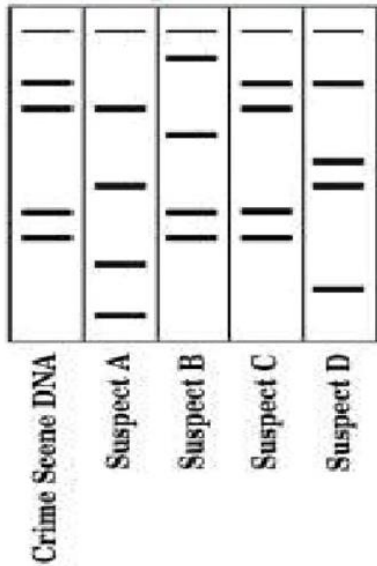
The objective of the above experiment was to show that

- (a) DNA replicates semi conservatively
- (b) DNA is the genetic material .
- (c) RNA is the genetic material
- (d) None of the above

35

The diagram below represents DNA fingerprint which are the result of gel electrophoresis done on several DNA samples found in crime scene

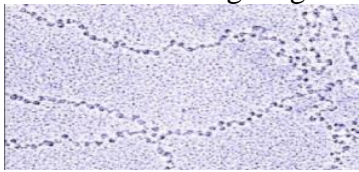
Gel Electrophoresis Results



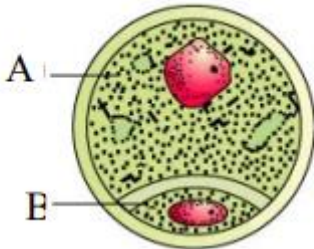
Which suspect is linked to the crime scene by DNA analysis-

- (a) Suspect A
- (b) Suspect B
- (c) Suspect C
- (d) Suspect D

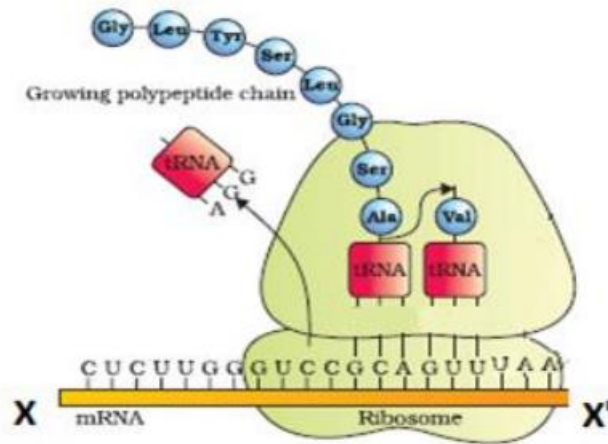
| | | |
|----|--|--|
| 36 | <p>What is true about cleavage in the fertilised egg in humans?</p> <ul style="list-style-type: none"> (a) It starts while the egg is in Fallopian tube. (b) It starts when the egg reaches uterus. (c) It is meroblastic (d) It is identical to the normal mitosis. | |
| 37 | <p>In the event of pregnancy, the corpus luteum persists under the influence of</p> <ul style="list-style-type: none"> (a) LH (b) FSH (c) chorionic gonadotropin (d) progesterone. | |
| 38 | <p>A particular species of plant produces light, non-sticky pollen in large numbers and its stigmas are long and feathery. These modifications facilitate pollination by</p> <ul style="list-style-type: none"> (a) insects (b) water (c) wind (d) animals. | |
| 39 | <p>256 microspores will form by the meiosis of-</p> <ul style="list-style-type: none"> (a) 512 microspore mother cells (b) 128 microspore mother cells (c) 64 microspore mother cells (d) 48 microspore mother cells | |
| 40 | <p>A haemophilic son born to normal parents. Give the genotype of parents:-</p> <ul style="list-style-type: none"> (a) Mother XX father X^cY (b) Mother X^hX, father XY (c) Mother XX, father XY | |

| | | |
|----|---|--|
| | (d)None of the above | |
| 41 | <p>Observe following diagram and give answers.</p>  <p>Identify the following diagram.</p> <p>(a) EM Picture- Bead in String (b) Nucleosome (c) Linker DNA (d)Histone</p> | |
| 42 | <p>Give the term for Regions in given structure which are loosely packed and stains lightly.</p> <p>(a) Heterochromatin (b) Euchromatin (c) Pseudo chromatin (d) None of above</p> | |
| 43 | <p>Select the two correct statements out of the four (I-IV) given below about Lac operon.</p> <p>I. Glucose or galactose may bind with the repressor and inactivate it. II. in the absence of lactose the repressor binds with the operator region III. The z-gene codes for region IV. This was elucidated by Francois Jacob and Jacques Monad</p> <p>The correct statement is:</p> <p>(a) II and III (b) I and III (c) II and IV (d) I and II</p> | |
| 44 | <p>Foetal ejection reflex in human female induces</p> <p>(a) release of hormones from placenta (b) growth and development of ovarian follicles (c) release of oxytocin from maternal pituitary (d)release of prolactin from pituitary</p> | |
| 45 | <p>In mammals, the first part of oogenesis starts in the germinal epithelium, which gives rise to the development of ovarian follicles, the functional unit of ovary. Oogenesis consists of several sub processes: oocytogenesis, ootidogenesis, and finally maturation to form an ovum Folliculogenesis is a separate sub process that accompanies all three oogenetic sub processes .</p> <p>Which cell division is involved in the formation of secondary oocyte?</p> <p>(a) Mitosis (b) Meiosis I (c)Amitosis (d) Meiosis II</p> | |
| 46 | <p>Which of the following methodology is used to identify all the genes that are expressed as RNA in Human Genome Project (HGP)?</p> <p>(a) Sequence Annotation (b) Expressed Sequence Tags (c) Karyotyping (d) Ammonification.</p> | |
| 47 | <p>For the translation to be initiated which of the following does not occur?</p> | |

| | | |
|-----------|--|--|
| | <ul style="list-style-type: none"> (a) Ribosome recruitment to the mRNA (b) Positioning of ribosome on 'GUG' (c) Addition of charged tRNA to the A site (d) Binding of the large and small subunits of the ribosome | |
| 48 | <p>What were the main criteria taken under consideration for the experiment by Hershey and Chase?</p> <ul style="list-style-type: none"> (a) DNA contains phosphorus, protein contains sulphur (b) Protein contains phosphorus, DNA contains sulphur (c) Both DNA and protein contains phosphorus and not sulphur (d) Both DNA and protein contains sulphur and not phosphorus | |
| Section C | | |
| 49 | <p>Read the following and answer the questions from 31(i) to 31(v) given below: Haemophilia is a genetic disorder of rare blood condition where people do not have the clotting factor which enables their blood to clot when bleeding. It's an inherited disease that's usually passed from mother to son. Haemophilia has been called a "royal disease". This is because the haemophilia gene was passed from Queen Victoria, who became Queen of England in 1837, to the ruling families of Russia, Spain and Germany. Queen Victoria's gene for haemophilia was caused by spontaneous mutation. Of her children, one son, Leopold, had haemophilia, and two daughters, Alice and Beatrice, were carriers. Beatrice's daughter married into the Spanish royal family. She passed the gene to the male heir to the Spanish throne. Queen Victoria's other daughter, Alice, had a carrier daughter, Alix. Alix became Empress Alexandra at her marriage to Russia's Czar Nicholas in 1894. Their son, born in 1904 and named Alexis, inherited haemophilia from his mother. Haemophilia is a recessive disorder and it can be only appeared in a generation if mother is carrier for disease and father has haemophilia or both parents have haemophilia. Haemophilia is a/ an _____ disease.</p> <ul style="list-style-type: none"> (a) X linked (b) Autosomal dominant (c) Autosomal recessive (d) Y linked | |
| 50 | <p>If the mother is carrier and father is normal than the chances of having normal son would be</p> <ul style="list-style-type: none"> (a) 0 % (b) 25 % (c) 50 % (d) 75% | |
| 51 | <p>If the maternal grandfather of a boy is haemophilic, maternal grandmother is normal and father is normal then what are the chances that he could have haemophilia disease?</p> <ul style="list-style-type: none"> (a) 25 % (b) 50 % (c) 75% (d) 0% | |
| 52 | <p>If haemophilia is not present in a population than sudden appearance of haemophilia in a population would be due to</p> <ul style="list-style-type: none"> (a) Recombination (b) Mutation | |

| | | |
|----|--|--|
| | (c) Replication (d) None of these. | |
| 53 | Assertion: Haemophilia is a genetic disorder of rare blood condition where people do not have the clotting factor. Reason: Due to low thromboplastin concentration. (a) Both assertion and reason are true, and reason is the correct explanation of assertion. (b) Both assertion and reason are true, but reason is not the correct explanation of assertion. (c) Assertion is true but reason is false. (d) Both assertion and reason are false. | |
| 54 | Assertion: Haemophilia is a genetic disorder generally found in males. Reason: Haemophilia is a sex-linked trait and the gene for haemophilia is located on the Y chromosome. (a) Both assertion and reason are true, and reason is the correct explanation of assertion. (b) Both assertion and reason are true, but reason is not the correct explanation of assertion. (c) Assertion is true but reason is false. (d) Both assertion and reason are false. | |
| 55 | Identify 'A' and 'B' in the following diagram of a mature pollen grain.  (a) A- Generative cell B- Vegetative cell (b) A- Vegetative cell B- Generative cell (c) A- vacuole B- Nucellus (d) A- Nucleus B- Vacuole | |
| 56 | How many sperms and ova will be produced from 50 primary spermatocytes and 50 oocytes respectively (a) 200 sperms, 50 ova (b) 100 sperms, 200 ova (c) 100 sperms, 50 ova (d) 50 sperms, 100 ova | |
| 57 | Progestin- estradiol combined contraceptive pills inhibit ovulation by: (a) Negative feedback on the release of estrogen from ovary required for follicular development in follicular phase (b) Preventing the uterine physiological and morphological changes required for implantation (c) Inhibiting the secretion of FSH and LH that are necessary for ovulation (d) Both (a) and (c) | |
| 58 | Arrange the following events in the order of synthesis of a protein i) A peptide bond forms ii) A tRNA matches its anticodon to the codon in the A- site iii) The movement of second tRNA complex from A-site to P-site iv) The large subunit attaches to the small subunit and the initiator tRNA fits in the P-site | |

| | | |
|----|---|--|
| | <p>v) A small subunit binds to the mRNA</p> <p>vi) The activated amino acid tRNA complex attaches the initiation codon on mRNA</p> <p>(a) iv, v, iii, ii, i, vi</p> <p>(b) iv, vi, v, ii, I, iii</p> <p>(c) v, iv, iii, ii, vi, I</p> <p>(d) v, vi, iv, ii, i, ii</p> | |
| 59 | <p>Read the following statements.</p> <p>I. Each testes have 25 compartments called testicular lobules.</p> <p>II. Each testicular lobule contains one to three highly coiled seminiferous tubules in which sperms are produced.</p> <p>III. Sertoli cells provide nutrition to testicles</p> <p>IV. Sertoli cells are activated by FSH Which of above statements are incorrect?</p> <p>(a) I and II</p> <p>(b)only I</p> <p>(c) II and IV</p> <p>(d)III and IV</p> | |
| 60 | <p>The significant aspect of reverse transcription is</p> <p>(a) the flow information from DNA to RNA</p> <p>(b) the flow information from RNA to DNA</p> <p>(c) the flow information from RNA to proteins</p> <p>(d) both a and c</p> | |
| 61 | <p>A true breeding pea plant, homozygous dominant for inflated green pods is crossed with another pea plant with constricted yellow pods (ffgg). With the help of punnett square show the above cross and mention the results obtained phenotypically and genotypically in F1 generation?</p> | |
| 62 | <p>During a field trip, one of your friend in the group suddenly became unwell, she started sneezing and had trouble in breathing. Name and explain the term associated with such sudden responses. What would the doctor recommend for relief?</p> | |
| 63 | <p>CTTAAG GAATTC (a) What are such sequences called? Name the enzyme used that recognizes such nucleotide sequences. (b) What is their significance in biotechnology?</p> | |
| 64 | <p>Explain the functions of the following structures in the human male reproductive system. (a) Scrotum (b) Leydig cells (c) Male accessory glands</p> | |
| 65 | <p>State the agent(s) which helps in pollinating in the following plants. Explain the adaptations in these plants to ensure pollination: (a) Corn (b) Water hyacinth (c) Vallisneria</p> | |
| 66 | <p>(a) Identify the polarity of x to x' in the diagram below and mention how many more amino acids are expected to be added to this polypeptide chain</p> | |



(b) Mention the codon and anticodon for alanine. (c) Why are some untranslated sequences of bases seen in mRNA coding for a polypeptide? Where exactly are they present on mRNA?

67 (a) How is Hardy-Weinberg's expression " $(p^2 + 2pq + q^2) = 1$ " derived? (b) List any two factors that can disturb the genetic equilibrium.

68 Highlight the structural importance of an antibody molecule with a diagram. Name the four types of antibodies found to give a humoral immune response, mentioning the functions of two of them you have studied.

OR

(a) Explain the Life cycle of Plasmodium starting from its entry in the body of female Anopheles till the completion of its life cycle in humans.

(b) Explain the cause of periodic recurrence of chill and high fever during malarial attack in humans.

**SAMPLE QUESTION PAPER
PHYSICAL EDUCATION (048)
SESSION (2022-23)**

TIME ALLOWED: 3 HRS

MAX. MARKS: 70

GENERAL INSTRUCTIONS:

- 1) The question paper consists of 5 sections and 37 Questions.
- 2) Section A consists of question 1-18 carrying 1 mark each and is multiple choice questions. All questions are compulsory.
- 3) Sections B consist of questions 19-24 carrying 2 marks each and are very short answer types and should not exceed 60-90 words. Attempt any 5.
- 4) Sections C consist of Question 25-30 carrying 3 marks each and are short answer types and should not exceed 100-150 words. Attempt any 5.
- 5) Sections D consist of Question 31-33 carrying 4 marks each and are case studies. There is internal choice available.
- 6) Section E consists of Question 34-37 carrying 5 marks each and are short answer types and should not exceed 200-300 words. Attempt any 3.

(SECTION -A)

Q1. Identify the asana:



- a) Paschimottanasana
- b) Halasana
- c) Vajrasana
- d) Dhanurasana

(Question for visually impaired)

Which asana amongst these can be done just after having meals?

- a) Bhujangasana
- b) Dhanurasana
- c) Vajrasana
- d) Ardhamatsyendrasana

Q2. A person who likes to learn new things, new concepts and new experiences are categorized as _____.

- a) Agreeableness
- b) Extroversion
- c) Conscientiousness
- d) Openness

Q3. Cartwheel in gymnastics is an example of _____

- a) Static Equilibrium
- b) Dynamic Equilibrium
- c) Active Equilibrium
- d) Passive Equilibrium

Q4. Slow twitch fibres are _____ in colour.

- a) White
- b) Red
- c) Transparent
- d) Brown

Q5. Jumping on the spot is an example of _____

- a) Iso-metric
- b) Iso-tonic
- c) Iso-kinetic
- d) Iso-kinesthetic

Q6. Take-off in Long jump is an example of _____ strength.

- a) Explosive strength
- b) Maximum strength
- c) Strength endurance
- d) Static strength

Q7.. The amount of oxygen which can be absorbed and consumed by the working muscles from the blood is called _____

- a) Oxygen Uptake
- b) Oxygen Intake
- c) Oxygen Transport
- d) Vital capacity

Q8. In Law of Acceleration, acceleration of an object is inversely proportionate to its

- a) Force
- b) Mass
- c) Speed
- d) Size

*Q9. Given below are the two statements labeled Assertion (A) and Reason (R).

Assertion: Intrinsic motivation has long term benefits.

Reason: As factors behind it are naturally pursuing actions that provide fun, pleasure, fulfillment or challenge

In the context of the above two statements, which one of the following is correct?

- a) Both (A) and (R) are true and (R) is the correct explanation of (A).
- b) Both (A) and (R) are true, but (R) is not the correct explanation of (A).
- c) (A) is true, but (R) is false.
- d) (A) is false, but (R) is true

Q10. Carbohydrates which are soluble in water and crystalline in structure.

- a) Simple
- b) Complex
- c) Compound
- d) Complicated

Q11. Which amongst these is not a micro mineral?

- a) Iodine
- b) Magnesium
- c) Iron
- d) Copper

Q12. Which asana is helpful in increasing height?

- a) Sukhasana
- b) Tadasana
- c) Bhujangasana
- d) Vajrasana

*Q13. How many byes will be given if there are 17 teams?

- a) 1
- b) 8
- c) 15
- d) 12

* Q14. How many matches will be played in the knockout tournaments first round if there are 15 teams?

- a) 8
- b) 7
- c) 5
- d) 6

Q15. Watching others play and enjoy which in turn motivates the Child with special need to participate is a part of which kind of strategy?

- a) Mental
- b) Physical
- c) Psychological
- d) Social

*Q16. Match the following:

- | | |
|------------------|-------------------|
| I. Garudasana. | 1. Round shoulder |
| II. Gomukhasana. | 2. Lordosis |
| III. Chakrasana. | 3. Bow legs |
| IV. Naukasana. | 4. Knock knees |

- a) I-3, II-4, III-1, IV-2
- b) I-1, II-3, III-4, IV-2
- c) I-4, II-2, III-1, IV-3
- d) I-2, II-3, III-4, IV-1

*Q17. Match the following:

- | | |
|---------------------------|---------------------------|
| I. Chair stand test. | 1. Lower Body strength |
| II. Arm curl test. | 2. Aerobic Endurance |
| III. Back scratch test. | 3. Upper body strength |
| IV. Six minute walk test. | 4. Upper body flexibility |

- a) I-1, II-3, III-4, IV-2
- b) I-2, II-3, III-1, IV-4
- c) I-1, II-3, III-2, IV-4
- d) I-2, II-3, III-4, IV-1

Q18. Weakening of bones due to loss of bone density and improper bone formation is known as _____

- a) Amenorrhea
- b) Anorexia Nervosa
- c) Osteoporosis
- d) Lordosis

(SECTION B)

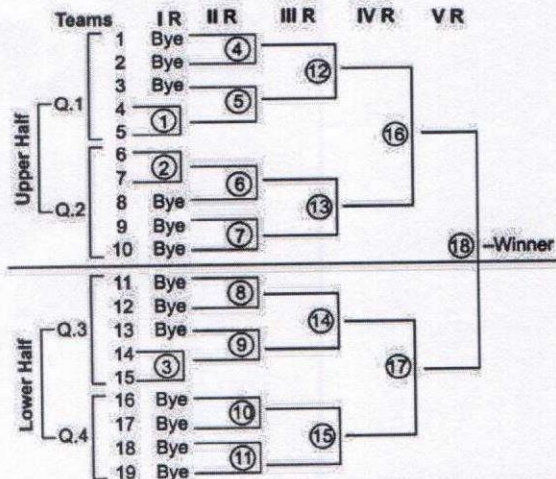
- Q19. List down any four effects of exercise on the muscular system. (0.5*4)
 Q20. List down any four benefits of self talk by athletes in sports (0.5*4)
 Q21. List down any four advantages of fartlek training method. (0.5*4)
 Q22. Explain any two types of soft tissue injuries with help of examples. (0.5*4)
 Q23. Write down the objectives and administration of the flamingo test. (1+1)
 *Q24. What should be the basic nutrient in a weightlifter's diet and why? (1+1)

(SECTION C)

- *Q25. Create a mind map including any six advantages of physical activities for children with special needs. (0.5X6=3)
 Q26. What are carbohydrates? Differentiate between its types. {1+ (0.5*4)}
 Q27. Define bye. Explain the rules of giving bye with help of an example. (1+2)
 *Q28. Make a table explaining any three personalities from Big five theory and their characteristics. (1+1+1)
 Q29. Explain any three physiological factors determining strength. (1+1+1)
 Q30. What is the meaning of female athletes Triad? Explain any two in brief. (1+ 2)

(SECTION D)

*31.



On the basis of above given fixture answer the following questions: (4X1=4)

- total number of matches in 2nd round are _____
- What is the formula for calculating the total number of matches?
- The fourth round in this case can also be called as _____
- What is the formula for calculating the number of byes

OR

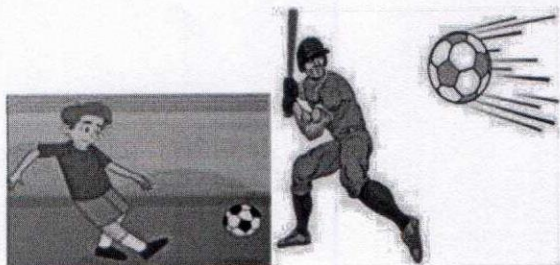
The formula for calculating number of rounds is _____

(Question for visually impaired)

List down any four committees working during conduct of a competition and briefly explain their role.

Q32. The teachers as well as coaches always make their best efforts to improve the performance of their students in various competitive games and sports. They can help to improve the performance of students if they have adequate knowledge of biomechanics.

(4X1=4)



- The more force one exerts on the downward bounce, the higher the ball bounces into the air. Which law is this statement being referred to?
- Among the above given pictures, Newton's 3rd law is depicted in _____
- Newton's second law is also known as _____
- The study of human body and various forces acting on it is _____

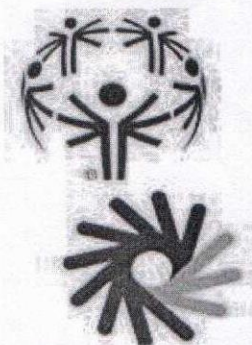
OR

A high jumper can jump higher off a solid surface because it opposes his or her body with as much force as he or she is able to generate. This example refers to which law of motion?

(Question for visually impaired)

What is equilibrium? Explain its types along with the factors increasing equilibrium. (1+4)

Q33. In relation to the pictures, answer the following questions.



- What is the mission of the first organization?
- What is the Motto of the first organization?
- Until 1965 the games in the second picture were known as _____
- Second picture games are conducted after every _____ years.

(Question for visually impaired)

Write a brief note on Paralympics including its origin, describing the various categories and criteria..

(SECTION E)

Q34. List down any four asanas used for prevention of asthma. Explain the procedure for administration of any one of them with help of a stick diagram. (2+2+1)

*Q35. Make a table of test items listed under fitness test by SAI (Age group 9-18 yrs) along with the objectives of conducting them. Explain the administration of any one of them. (4+1)

Q36. Define flexibility along with its types. Explain any two methods used to develop flexibility. (2+3)

Q37. Define Projectile and explain any two factors affecting projectile with help of examples from sports. (1+4)

ANSWER KEY
Physical Education
(Session 2022-23)

| Q.NO. | ANSWER | MARKS DISTRIBUTION |
|--------------------|---|--------------------|
| (SECTION A) | | |
| 1. | d) Dhanurasana For visually impaired c) Vajrasana | 1 |
| 2. | d) Openness | 1 |
| 3. | b) Dynamic Equilibrium | 1 |
| 4. | b) Red | 1 |
| 5. | b) Iso-tonic | 1 |
| 6. | a) Explosive strength | 1 |
| 7. | a) Oxygen Uptake | 1 |
| 8. | b) Mass | 1 |
| 9. | a) Both (A) and ® are true and ® is the correct explanation of (A). | 1 |
| 10. | a) Simple | 1 |
| 11. | b) Magnesium | 1 |
| 12. | b) Tadasana | 1 |
| 13. | c) 15 | 1 |
| 14. | b) 7 | 1 |
| 15. | d) social | 1 |
| 16. | a) I-3,II-4,III-1,IV-2 | 1 |
| 17. | a) I-1,II-3,III-4,IV-2 | 1 |
| 18. | c) Osteoporosis | 1 |
| (SECTION B) | | |

| 19. | <p style="text-align: center;">Effect of Exercises on Muscular System</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Short Term</th> <th>Long term</th> </tr> </thead> <tbody> <tr> <td>Increased blood supply</td> <td>Hypertrophy of Muscle</td> </tr> <tr> <td>Increased muscle temperature</td> <td>Increases in strength of ligaments and tendons</td> </tr> <tr> <td>Increase muscle flexibility</td> <td>Increase in size and number of mitochondria</td> </tr> <tr> <td>Accumulation of Lactate</td> <td>Increase in myoglobin storage</td> </tr> <tr> <td>Micro tears in muscle fibers</td> <td>Increase in glycogen storage</td> </tr> <tr> <td></td> <td>Increase in oxidation/metabolism</td> </tr> <tr> <td></td> <td>Increase in lactate acid tolerance</td> </tr> </tbody> </table> | Short Term | Long term | Increased blood supply | Hypertrophy of Muscle | Increased muscle temperature | Increases in strength of ligaments and tendons | Increase muscle flexibility | Increase in size and number of mitochondria | Accumulation of Lactate | Increase in myoglobin storage | Micro tears in muscle fibers | Increase in glycogen storage | | Increase in oxidation/metabolism | | Increase in lactate acid tolerance | 2 |
|--|--|--|---|------------------------|-----------------------|------------------------------|--|-----------------------------|---|-------------------------|-------------------------------|------------------------------|------------------------------|--|----------------------------------|--|------------------------------------|---|
| Short Term | Long term | | | | | | | | | | | | | | | | | |
| Increased blood supply | Hypertrophy of Muscle | | | | | | | | | | | | | | | | | |
| Increased muscle temperature | Increases in strength of ligaments and tendons | | | | | | | | | | | | | | | | | |
| Increase muscle flexibility | Increase in size and number of mitochondria | | | | | | | | | | | | | | | | | |
| Accumulation of Lactate | Increase in myoglobin storage | | | | | | | | | | | | | | | | | |
| Micro tears in muscle fibers | Increase in glycogen storage | | | | | | | | | | | | | | | | | |
| | Increase in oxidation/metabolism | | | | | | | | | | | | | | | | | |
| | Increase in lactate acid tolerance | | | | | | | | | | | | | | | | | |
| 20. | <p>Benefits of self talk</p> <ol style="list-style-type: none"> 1. Building and developing self efficacy 2. Skill acquisition 3. Creating and changing mood 4. Controlling efforts 5. Focusing attention | 2 | | | | | | | | | | | | | | | | |
| 21. | <table border="0" style="width: 100%;"> <tr> <td style="vertical-align: top; width: 50%;"> <p>Advantages</p> <ul style="list-style-type: none"> • Develops strength and endurance • Appropriate form of training for most sports • Can be adjusted to suit age, fitness and health of the athlete • Exercises are simple enough to make each athlete feel a sense of achievement in completing them • A wide range of exercises to select from which will maintain the athlete's enthusiasm • Can be done in the group </td> <td style="vertical-align: top; width: 50%;"> <p>Disadvantages</p> <ul style="list-style-type: none"> • Many exercises require specialized equipment - e.g. gym equipment • Ample space required to set up the circuit exercises & equipment • In general can only be conducted where appropriate facilities/equipment are available • Use of additional equipment requires appropriate health and safety monitoring </td> </tr> </table> | <p>Advantages</p> <ul style="list-style-type: none"> • Develops strength and endurance • Appropriate form of training for most sports • Can be adjusted to suit age, fitness and health of the athlete • Exercises are simple enough to make each athlete feel a sense of achievement in completing them • A wide range of exercises to select from which will maintain the athlete's enthusiasm • Can be done in the group | <p>Disadvantages</p> <ul style="list-style-type: none"> • Many exercises require specialized equipment - e.g. gym equipment • Ample space required to set up the circuit exercises & equipment • In general can only be conducted where appropriate facilities/equipment are available • Use of additional equipment requires appropriate health and safety monitoring | 2 | | | | | | | | | | | | | | |
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| 22. | <p>A soft tissue injury is the damage of muscles, ligaments and tendons throughout the body.</p> <div style="text-align: center;"> <p>Type of soft tissue injuries</p> <pre> graph TD A[Type of soft tissue injuries] --> B[Abrasion] A --> C[Contusion] A --> D[Laceration] A --> E[Strain] A --> F[Sprain] A --> G[Incision] </pre> </div> | 2 | | | | | | | | | | | | | | | | |

23. 3.3: Static Balance (Flamingo Balance Test)

2

What does it measure:
Ability to balance successfully on a single leg. This single leg balance test assesses the strength of the leg, pelvic, and trunk muscle as well as static balance.

How to Perform:
Stand on the beam. Keep balance by holding the instructor's hand (if required to start).

Infrastructure/Equipment Required:
Non Slippery even surface, Stopwatch, can be done by just standing on a beam.

Scoring:
The total number of falls or loss of balance in 60 seconds of balancing is recorded.
If there are more than 15 falls in the first 30 seconds, the test is terminated.

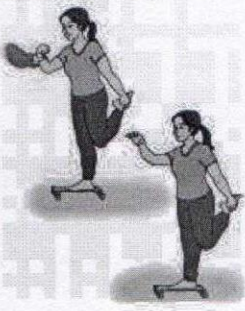
Start the watch as the instructor lets go of the participant/subject.

While balancing on the preferred leg, the free leg is flexed at the knee and the foot of this leg held close to the buttocks.

Pause the stopwatch each time the subject loses balance (either by falling off the beam or letting go of the foot being held).

Resume over, again timing until they lose balance. Count the number of falls in 60 seconds of balancing.

If there are more than 15 falls in the first 30 seconds, the test is terminated.



Administrative Suggestion:
Participants should be encouraged to focus eyes on stationary objects straight ahead.

Suggested Physical activities to improve Balance (Flamingo Test)
To improve balance, you should practice one foot balance, walking on toes and heel toe walking, walking on straight lines, skipping, hopping, vrikshasana, walking on beam etc.

24. Proteins

2

| | | |
|------------------------|---|--|
| <p>Proteins</p> | <ul style="list-style-type: none"> • Proteins build and repair body cells • Proteins form part of various enzymes, hormones, and antibodies • Also provide energy (4 Kcal/g) | <p>Milk and milk product fish, eggs, poultry, meat, legumes and grains</p> |
|------------------------|---|--|

(SECTION C)

25. Six advantages of physical activities for children with special needs

3

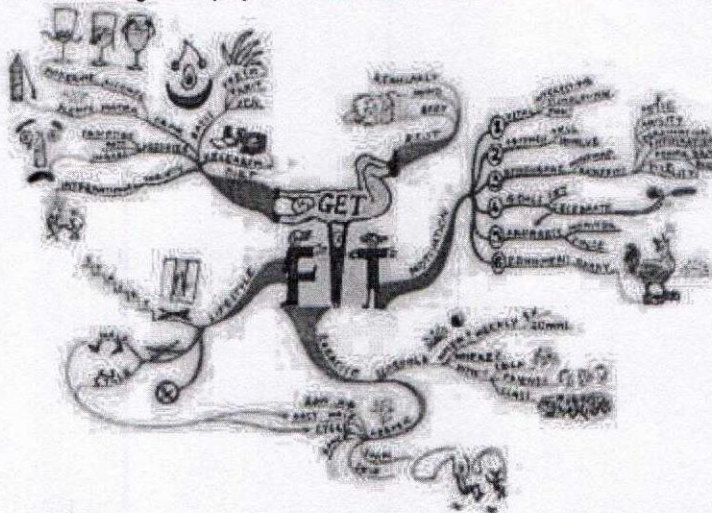
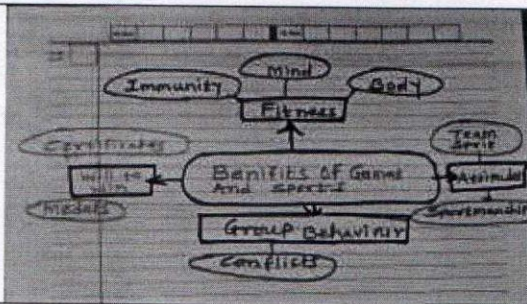


Plate 3.



26. Carbohydrates are organic compounds made up of Carbon, Hydrogen and Oxygen. Carbohydrates are a major source of energy Carbohydrates.
monosaccharide,
disaccharides and polysaccharides
Simple sugars (mono and disaccharides) are found in fruits (sucrose, glucose and fructose), milk (lactose) and sweets that are produced commercially and added to foods to sweeten, prevent spoilage, or improve structure and texture. Polysaccharides are more than two units of monosaccharide joined together. These are Starches and fibre (cellulose). These are also called **complex sugars** and are found in whole grain cereals, rice, oats, potatoes, bread, legumes, corn and flour.

3

27. The position of a participant in a tournament who is not paired with an opponent, usually in the first round, and advanced to the next round without playing. The right to proceed to the next round of a competition without contesting the present round, often through nonappearance of an opponent.
Allotment of byes in the fixture should be given in following order:
 First bye will be given to last team of Lower Half,
 Second by will be given to first team of Upper Half,
 Third bye will be given to first team of Lower Half,
 Fourth bye will be given to last team of Upper Half
 Same pattern will be followed after fourth bye till the remaining byes have been given.,

3

28.

| Trait | Description |
|--------------------------|--|
| Openness | Being curious, original, intellectual, creative, and open to new ideas. |
| Conscientiousness | Being organized, systematic, punctual, achievement-oriented, and dependable. |
| Extraversion | Being outgoing, talkative, sociable, and enjoying social situations. |
| Agreeableness | Being affable, tolerant, sensitive, trusting, kind, and warm. |
| Neuroticism | Being anxious, irritable, temperamental, and moody. |

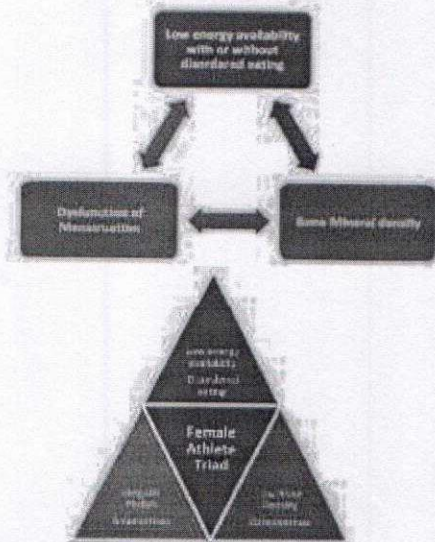
3

29. **Strength** – Strength component has varied sub-types like maximum strength, Explosive strength, Strength, Endurance etc. Each has different types of exercise, intensity and duration so physiological factors vary. In games like weightlifting, jumps, sprint or power, agility and strength dominating sports where force production is high, fatigue is quick, and fast twitch fibre percentage must be high in muscles. ATP-CP system or anaerobic system works to produce energy for strength training. Stroke volume (the volume of blood pumped out of the left ventricle of the heart during each systolic cardiac contraction) is a vital parameter as far as cardiovascular system is concerned.

3

30. **Female Athlete Triad.**

3



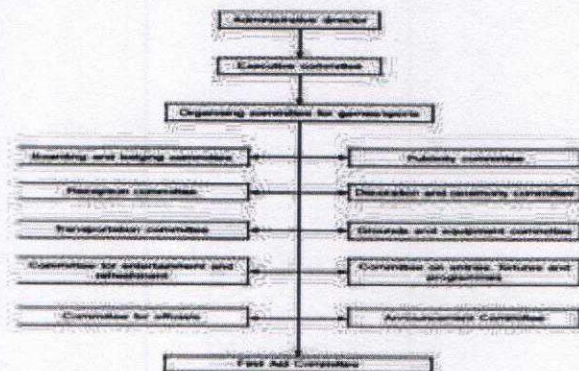
- (a) disordered eating-
- (b) amenorrhea and
- (c) osteoporosis

(SECTION D)

31. A) 8
 B) N-1
 C) Semi final
 D) 2ⁿ-N

4

For visually impaired students



| | | |
|-----|---|---|
| 32. | <p>a) Third law of motion-Action reaction b) 1st picture c) Law of Acceleration d) Kinesiology Third law of motion-Action reaction</p> <p>For visually impaired students</p> <p>Guiding Principles to Determine the Degree of Stability</p> <ol style="list-style-type: none"> 1. Broader the base, the greater the stability: Broadening the base of support helps an athlete to achieve greater stability. <i>eg., while standing spreading the feet in the direction of movement provide stability. Where a stance is required, using both hands and feet creates the widest base.</i> 2. Body weight is directly proportional to stability: The athlete or an object which weighs more will have greater stability. <i>eg., it is difficult to move a heavier person than a lighter one, Combative sports like, judo, wrestling, taekwondo, and boxing are played according to the bodyweight principle.</i> 3. Lower the Centre of gravity, higher the stability: When a player does an activity that needs stability, the player usually lowers their centre of gravity by bending. <i>eg., when a player bends his knees while running, he can stop sooner and more efficiently. Similarly, a wrestler half sits to maintain his stability. Even a shot-put thrower bends his knees in the end so that he may avoid a foul.</i> 4. The nearer the centre of gravity to the centre of the base of support the more will be the stability: If the centre of gravity extends beyond the base of support, balance is lost. Keeping the body's weight centred over the base will support and help maintain stability. <i>eg., when a gymnast walks on a balance beam one requires a small base of support. During the performance, if the balance is lost the gymnast raises the arm or legs on the opposite sides to shift the centre of gravity back towards the base of support.</i> 5. Direction of acting force: During a competition, if the direction of an acting/applied force is known, stability can be increased by moving the line of gravity as close as possible to the edge of the base where the force is expected. <i>eg., when in a judo match the judoka shifts his foot in the line of direction of the force applied by the opponent to use the force of the opponent as a counterforce to throw him down.</i> | 4 |
| 33. | <ol style="list-style-type: none"> a. The mission of Special Olympics is to provide year-round sports training and athletic competition in a variety of Olympic-type sports for children and adults with intellectual disabilities, giving them continuing opportunities to develop physical fitness, demonstrate courage, experience joy and participate in events b. "Let me win. But if I cannot win, let me be brave in the attempt." c. International Games for the Deaf International Silent Games" d. 4yrs | 4 |

For visually impaired students

4.1.1 PARALYMPICS

Paralympics is a mega sports event involving athletes with a range of disabilities, and is organized by the International Paralympic Committee. The range of disabilities includes impaired muscle power (eg., paraplegia and quadriplegia, muscular dystrophy, post-polio syndrome, spina bifida), impaired passive range of movement, limb deficiency (eg., amputation or dysmelia), leg length difference, short stature, hypertonia, ataxia, athetosis, vision impairment and intellectual impairment. These disabilities are further divided into classifications which vary from sport to sport. The word Paralympics is derived from the Greek word para which means beside or alongside and Olympic. Combined, Paralympics means an international Games competition that is parallel to the Olympics. Thus, the word Paralympics refers to "a series of international contests for athletes with disabilities that are associated with and held following the summer and winter Olympic Games." There are Winter and Summer Paralympic Games, which since the 1988 Summer Games in Seoul, South Korea, are held almost immediately following the respective Olympic Games. All Paralympic Games are governed by the International Paralympic Committee (IPC).



International Paralympic Committee (IPC) was formed on 22 September 1989 and is situated in Germany. IPC organizes Summer and Winter Paralympic Games and coordinates world championships and other competitions. The vision of IPC is 'To enable Para athletes to achieve sporting excellence and inspire and excite the world.'

The purpose of the criteria

h Defining the impairment group in which an athlete can compete in the various sports.

h Grouping athletes in classes defined by the degree of activity-limitation related to the impairment and/or specific to the task in the sport.

The IPC has established ten disability categories, including physical, visual, and intellectual impairment. Athletes with one of these disabilities can compete in the Paralympics though not every sport can allow for every disability category.

These categories apply to both Summer and Winter Paralympics.

1. Physical Impairment – There are eight different types of physical impairment:

h Impaired muscle power – With impairments in this category, the force generated by muscles, such as the muscles of one limb, one side of the body or the lower half of the body is reduced. eg., spinal cord injury, spina bifida, post-polio syndrome.

h Impaired passive range of movement – The range of movement in one or more joints is reduced in a systematic way. Acute conditions such as arthritis are not included in this category.

h Loss of limb or limb deficiency – A total or partial absence of bones or joints from partial or total loss due to illness, trauma, or congenital limb deficiency. eg., amputation, dysmelia.

h Leg-length difference – Significant bone shortening occurs in one leg due to congenital deficiency or trauma. Short stature – Standing height is reduced due to shortened legs, arms and trunk, which are due to a Musculo-skeletal deficit of bone or cartilage structures. eg., achondroplasia, growth hormone deficiency,

osteogenesis imperfecta.

h Hypertonia – Hypertonia is marked by an abnormal increase in muscle tension and reduced ability of a muscle to stretch. Hypertonia may result from injury, disease, or conditions which involve damage to the central nervous system. eg., cerebral palsy.

h Ataxia – Ataxia is an impairment that consists of a lack of coordination of muscle movements. eg., cerebral palsy, Friedreich's ataxia, multiple sclerosis.

h Athetosis–Athetosis is generally characterized by unbalanced, involuntary movements and a difficulty maintaining a symmetrical posture (eg., cerebral palsy, choreoathetosis).

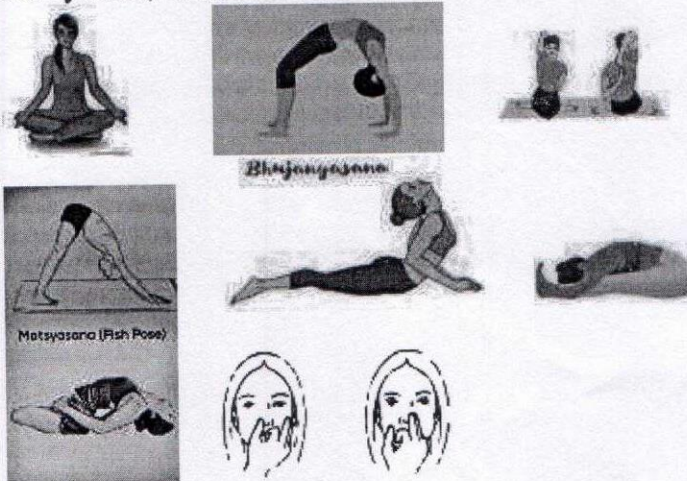
2. Visual Impairment – Athletes with visual impairment ranging from partial vision, sufficient to be judged legally blind, to total blindness. This includes impairment of one or more component of the visual system – eye structure, receptors, optic nerve pathway, and visual cortex. The sighted guides for athletes with a visual impairment are such a close and essential part of the competition that the athlete with visual impairment and the guide are considered a team. Beginning in 2012, these guides, along with sighted goalkeepers in 5-a-side football, became eligible to receive medals of their own.

3. Intellectual Disability – Athletes with a significant impairment in intellectual functioning and associated limitations in adaptive behaviour fall under the category of intellectual disability. The IPC primarily serves athletes with physical disabilities, but the Intellectual Disability group has been added to some Paralympic Games. This includes only athletes with exceptional athletic ability who have intellectual disabilities diagnosed before the age of 18. However, the IOC recognized Special Olympics World Games are open to all people with intellectual disabilities.

(SECTION E)

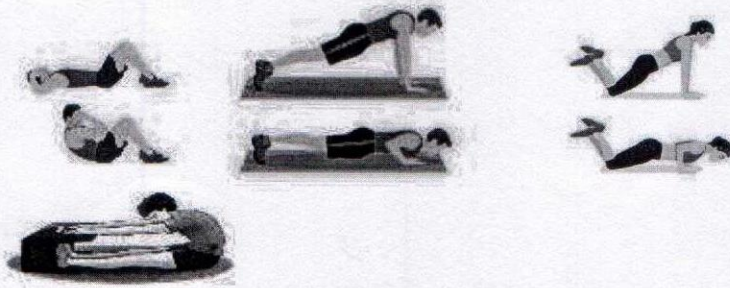
34.

- Asthma: Sukhasana, Chakrasana, Gomukhasana, Parvatasana, Bhujangasana, Paschimottanasana, Matsyasana, Anulom-Vilom



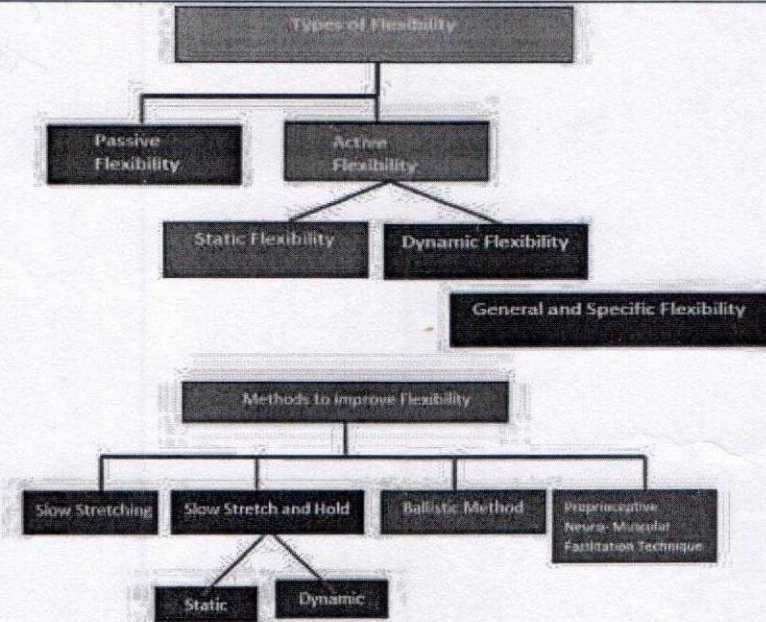
5

35. Age group 9-18yrs/ class 4-12: BMI, 50mt Speed test, 600mt Run/Walk, Sit & Reach flexibility test, Strength Test (Abdominal Partial Curl Up, Push-Ups for boys, Modified Push-Ups for girls).



5

36.



5

37.

FACTORS AFFECTING PROJECTILE TRAJECTORY

- ✦ Initial velocity
- ✦ Angle of projection
- ✦ Projection height relevant to the landing surface
- ✦ Air resistance
 - Surface area of the projectile
 - Surface to volume ratio
 - Mass
 - Velocity
- ✦ Gravity
- ✦ Spin

5

| | |
|----|--|
| 1 | Which of the following is not a function/method of a file object in python? a. read() b. writelines() c. dump() d. readlines() |
| 2 | Name the protocol that is used to send emails |
| 3 | Rearrange the following terms in increasing order of data transfer rates. Gbps, Mbps, Tbps, Kbps, bps |
| 4 | Differentiate between Web server and web browser. Write any two popular web browsers. |
| 5 | Expand the following terms: a. SMTP b. XML c. LAN d. TCP |
| 6 | is a device that forwards data packets along networks. |
| 7 | Write a function in Python PUSH(Arr), where Arr is a list of numbers. From this list push all numbers divisible by 5 into a stack implemented by using a list. Display the stack if it has at least one element, otherwise display appropriate error message. |
| 8 | How many pair of wires are there in twisted pair cable(Ethernet)?What is the name of port ,which is used to connect Ethernet cable to a computer or a labtop? |
| 9 | A binary file "Book.dat" has structure [BookNo, Book_Name, Author, Price]. i. Write a user defined function CreateFile() to input data for a record and add to Book.dat . ii. Write a function CountRec(Author) in Python which accepts the Author name as parameter and count and return number of books by the given Author are stored in the binary file "Book.dat" |
| 10 | A text file is opened using the statement <code>f = open('story.txt')</code> . The file has a total of 10 lines. Which of the following options will be true if statement 1 and statement 2 are executed in order. Statement 1: <code>L1 = f.readline()</code> Statement 2: <code>L2 = f.readlines()</code> a. L1 will be a list with one element and L2 will be list with 9 elements. b. L1 will be a string and L2 will be a list with 10 elements. c. L1 will be a string and L2 will be a list with 9 elements. L1 will be a list with 10 elements and L2 will be an empty list. |
| 11 | Shylesh is writing python code to append a new record to a binary file 'salary.dat' that is storing list objects containing [empid, empname, salary]. Consider the following code written by him. <pre>import pickle f = open('salary.dat', 'ab') id = input("Enter employee id : ") name = input("Enter name of employee: ") sal = float(input("Enter salary :")) record = _____ #Blank 1 pickle.dump(record,f) f.close()</pre> Identify the missing part of Blank 1. a. [id,name,sal] b. id, name, sal c. [empid, empname, salary] empid, empname, salary |

12 Jonathan and Jonathan Training Institute is planning to set up its center in Amritsar with four specialized blocks for Medicine, Management, Law courses along with an Admission block in separate buildings. The physical distances between these blocks and the number of computers to be installed in these blocks are given below. You as a network expert have to answer the queries raised by their board of directors as given in (i) to (iv).

Shortest distances between various locations in meters:

| | |
|------------------------------------|-----|
| Admin Block to Management Block | 60 |
| Admin Block to Medicine Block | 40 |
| Admin Block to Law Block | 60 |
| Management Block to Medicine Block | 50 |
| Management Block to Law Block | 110 |
| Law Block to Medicine Block | 40 |

Number of Computers installed at various locations are as follows:

| | |
|------------------|-----|
| Admin Block | 150 |
| Management Block | 70 |
| Medicine Block | 20 |
| Law Block | 50 |

(i). Suggest the most suitable location to install the main server of this institution to get efficient connectivity.

(ii). Suggest by drawing the best cable layout for effective network connectivity of the blocks having server with all the other blocks.

(iii). Suggest the devices to be installed in each of these buildings for connecting computers installed within the building out of the following:

- Modem
- Switch
- Gateway
- Router

(iv) Suggest the most suitable wired medium for efficiently connecting each computer installed in every building out of the following network cables:

- Coaxial Cable
- Ethernet Cable
- Single Pair

Telephone Cable.

13 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.

- Traverse the content of the list and push the even 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:

38 22 98 56 34 12

Kendriya Vidyalaya K-Area, Zirakpur

Class XII English Core

Autumn break Holiday Homework

1. Go through and learn all lessons covered in the month of September.
2. Paste and solve all the questions of September Monthly Test Question Paper.
3. Solve the Question Paper of English Core sent by the teacher.
4. Complete your Art-Integrated Project Work.