



Monthly Progressive Test

Class: XII

Subject: PCMB



Test Booklet No.: MPT-03

Test Date:

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Time: 120 mins

Full Marks: 200

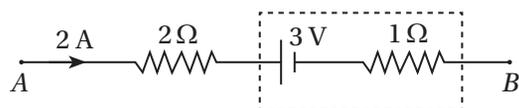
Important Instructions :

1. The Test is of 120 mins duration and the Test Booklet contains 100 multiple choice questions of single correct option only. There are four sections with four subjects. You have to attempt all 100 questions (Candidates are advised to read all 100 questions). Questions 1 to 25 contain Physics, Questions 26 to 50 contain Chemistry, Questions 51 to 75 contain Mathematics, Questions 76 to 100 contain Biology.
2. Each question carries 2 marks. For each correct response, the candidate will get 2 marks. There is no negative mark for wrong response. The maximum mark is 200.
3. Use Blue / Black Ball point Pen only for writing particulars marking responses on Answer Sheet.
4. Rough work is to be done in the space provided for this purpose in the Test Booklet only.
5. On completion of the test, the candidate must handover the Answer Sheet to the invigilator before leaving the Room / Hall. The candidates are allowed to take away this Test Booklet with them.
6. The CODE for this Booklet is Off Line MPT03 22082025.
7. The candidates should ensure that the Answer Sheet is not folded. Do not make any stray marks on the Answer Sheet. Do not write your UID No. anywhere else except in the specified space. Use of white fluid for correction is NOT permissible on the Answer Sheet. **Do not scibble or write on or beyond discrete bars of OMR Sheet at both sides.**
8. Each candidate must show on-demand his/her Registration document to the Invigilator.
9. No candidate, without special permission of the Centre Superintendent or Invigilator, would leave his/her seat.
10. Use of Electronic Calculator/Cellphone is prohibited.
11. The candidates are governed by all Rules and Regulations of the examination with regard to their conduct in the Examination Hall. All cases of unfair means will be dealt with as per Rules and Regulations of this examination.
12. No part of the Test Booklet and Answer Sheet shall be detached under any circumstances.
13. There is no scope for altering response mark in Answer Sheet.

Space For Rough Works



13. Figure represents a part of a closed circuit. The potential difference between points A and B ($V_A - V_B$) is



- (A) 9 V (B) -9 V (C) 3 V (D) 6 V
14. The resistance of a wire is 'R' ohm. If it is melted and stretched to 'n' times its original length, its new resistance will be
(A) R/n (B) n^2R (C) R/n^2 (D) nR
15. The electric potential due to an electric dipole at an axial point, distant r from the dipole is related to r as
(A) r (B) r^{-1} (C) r^2 (D) r^{-2}

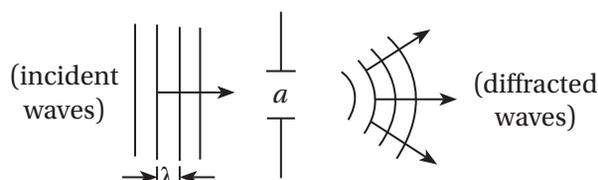
■ Assertion-Reason type Questions (Q.16–Q.19):

Directions: Read the following questions and choose any one of the following four responses.

- A. Assertion and Reason both are correct and Reason is the correct explanation of Assertion.
 B. Assertion and Reason both are correct and Reason is not the correct explanation of Assertion.
 C. Assertion is correct and Reason is wrong.
 D. Assertion is wrong but Reason is correct.
16. **Assertion:** Higher is the refractive index of a medium or denser the medium, lesser is the velocity of light in that medium.
Reason: Refractive index is inversely proportional to velocity.
 (A) A (B) B (C) C (D) D
17. **Assertion:** A capacitor of suitable capacitance can be used in an AC circuit in place of the choke coil.
Reason: A capacitor blocks DC and allows AC only.
 (A) A (B) B (C) C (D) D
18. **Assertion:** Acceleration of a vertically falling magnet through a horizontal metallic ring is less than g .
Reason: Current induced in the ring opposes the fall of magnet.
 (A) A (B) B (C) C (D) D
19. **Assertion:** Electrons move away from a region of lower potential to a region of higher potential.
Reason: An electron has a negative charge.
 (A) A (B) B (C) C (D) D

Case Based Type Questions—I (Q.20–Q.22):

The phenomenon of bending of light around the sharp corners and the spreading of light within the geometrical shadow of the opaque obstacles is called diffraction of light. The light thus deviates from its linear path. The deviation becomes much more pronounced, when the dimensions of the aperture or the obstacle are comparable to the wavelength of light.

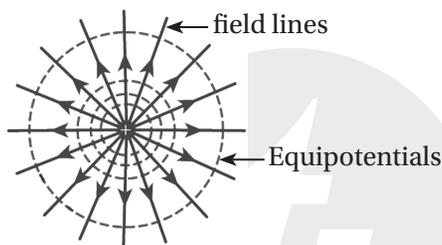


On basis of this information answer the following questions.

20. In diffraction from a single slit the angular width of the central maxima does not depend on
 (A) λ of the light used (B) width of the slit
 (C) distance of slit from the screen (D) ratio of λ and slit width
21. For a diffraction from a single slit, the intensity of the central point is
 (A) infinite
 (B) finite and same magnitude as the surrounding maxima
 (C) finite but much larger than the surrounding maxima
 (D) finite and substantially smaller than the surrounding maxima
22. In a single diffraction pattern observed on a screen placed at D metre distance from the slit of width d metre, the ratio of the width of the central maxima to the width of other secondary maxima is
 (A) 2 : 1 (B) 1 : 2 (C) 1 : 1 (D) 3 : 1

Case Based Type Questions—II (Q.23–Q.25):

All points in a field that have the same potential can be imagined as lying on a surface called an equipotential surface. When a charge moves on such a surface no energy transfer occurs and no work is done.



On basis of this information answer the following questions.

23. Two equipotential surfaces have a potential of -20 V and 80 V respectively, the difference in potential between these surface is
 (A) 100 V (B) 90 V (C) 80 V (D) 0 V
24. Equipotential surfaces
 (A) are closer in region of higher electric fields compared to the region of lower electric fields.
 (B) will be more crowded near sharp edges of a conductor.
 (C) will be more crowded near region of large charge densities.
 (D) all of the above
25. The work done to move a charge along an equipotential A to B
 (A) cannot be defined as $-\int_A^B \vec{E} \cdot d\vec{l}$ (B) must be defined as $-\int_A^B \vec{E} \cdot d\vec{l}$
 (C) can have a non-zero value (D) none of these

Chemistry

26. What is the denticity of the ligand E.D.T.A ?
 (A) 2 (B) 4 (C) 6 (D) 8
27. A chelating agent has two or more than two donor atoms to bind to a single metal ion. Which of the following is not a chelating agent ?
 (A) Thiosulphato (B) Glycinato (C) Oxalato (D) Ethane - 1, 2 - diamine.

28. How many ions are produced from the complex $[\text{Co}(\text{NH}_3)_5 \text{Cl}] \text{Cl}_2$
 (A) 4 (B) 2 (C) 3 (D) 5
29. Which of these compounds does not show paramagnetism ?
 (A) $\text{Cu}(\text{NH}_3)_4\text{Cl}_2$ (B) $[\text{Ag}(\text{NH}_3)_2]\text{Cl}$ (C) NO (D) NO_2
30. A first order reaction was completed 70% in 20 minutes. What is the rate constant of the reaction?
 (A) 0.07 min^{-1} (B) 0.06 min^{-1} (C) 0.08 min^{-1} (D) 0.09 min^{-1}
31. The plot of $\log k$ versus $\frac{1}{T}$ of a first order is linear with a :
 (A) positive slope and zero intercept (B) positive slope and non-zero intercept
 (C) Negative slope and non-zero intercept (D) Negative slope and zero intercept

32. For the following reaction : $\text{A}(\text{g}) \longrightarrow \text{B}(\text{g}) + \text{C}(\text{g})$

The initial pressure was P_0 while pressure after time 't' was P_t . The rate constant k will be given by :

- (A) $K = \frac{2.303}{t} \log_{10} \left(\frac{P_0}{P_t} \right)$ (B) $K = \frac{2.303}{t} \log_{10} \left(\frac{P_0}{P_0 - 2P_t} \right)$
 (C) $K = \frac{2.303}{t} \log_{10} \left(\frac{P_0}{2P_0 - P_t} \right)$ (D) $K = \frac{2.303}{t} \log_{10} \left(\frac{P_0}{P_0 - P_t} \right)$

33. For a reaction $\text{N}_2\text{O}_5 \longrightarrow 2\text{NO}_2 + \frac{1}{2} \text{O}_2$

Given : $\frac{d(\text{N}_2\text{O}_5)}{dt} = K_1(\text{N}_2\text{O}_5)$

$\frac{d(\text{NO}_2)}{dt} = K_2(\text{N}_2\text{O}_5)$

$\frac{d(\text{O}_2)}{dt} = K_3(\text{N}_2\text{O}_5)$

The relation between K_1 , K_2 and K_3 are :

- (A) $2K_1 = K_2 = 4K_3$ (B) $K_1 = K_2 = K_3$ (C) $2K_1 = 4K_2 = K_3$ (D) $\frac{1}{2}K_1 = K_2 = \frac{1}{4}K_3$
34. E. m. f of the cell $\text{Ni} | \text{Ni}^{++} (0.1 \text{ M}) || \text{Au}^{3+} (1.0 \text{ M}) | \text{Au}$ will be : $[E^\circ_{\text{Ni}/\text{Ni}^{2+}} = 0.25 \text{ V}, E^\circ_{\text{Au}/\text{Au}^{3+}} = -1.5 \text{ V}]$
 (A) 1.75 v (B) -1.7795 v (C) +1.779 v (D) 0.7795 v
35. The specific conductance of 0.01 (M) solution of KCl is $0.0014 \Omega^{-1} \text{ cm}^{-1}$ at 25.c. It's equivalent conductance ($\text{cm}^2 \Omega^{-1} \text{ eq}^{-1}$) is :
 (A) 140 (B) 14 (C) 1.4 (D) 0.14
36. If $E^\circ_{\text{Fe}^{3+}/\text{Fe}}$ is x_1 , $E^\circ_{\text{Fe}^{3+}/\text{Fe}^{2+}}$ is x_2 then $E^\circ_{\text{Fe}^{3+}/\text{Fe}^{2+}}$ will be :
 (A) $3x_2 - 2x_1$ (B) $x_2 - x_1$ (C) $x_2 + x_1$ (D) $2x_1 + 3x_2$
37. The specific conductances of four electrolytes in $\text{Ohm}^{-1} \text{ cm}^{-1}$ are given in option below. Which one offers highest resistance to the passage of electric current ?
 (A) 7×10^{-3} (B) 9.2×10^{-9} (C) 6×10^{-7} (D) 4×10^{-8}

38. $\text{Zn} | \text{Zn}^{2+}(\text{C}_1) || \text{Zn}^{2+}(\text{C}_2) | \text{Zn}$ for this cell ΔG is negative of :
- Ⓐ $\text{C}_1 = \text{C}_2$ Ⓑ $\text{C}_1 > \text{C}_2$ Ⓒ $\text{C}_2 > \text{C}_1$ Ⓓ None of these
39. The nature of curve of E_{cell}° Vs $\log K_c$ is :
- Ⓐ straight line Ⓑ parabola Ⓒ hyperbola Ⓓ elliptical curve
40. Salt bridge contains :
- Ⓐ Calomel Ⓑ Corrosive sublimate Ⓒ Water Ⓓ Agar-agar passage

Assertion and Reason : (Q. 41 to Q. 44)

Directions: Read the following questions and choose any one of the following four responses.

- Assertion and Reason both are correct and Reason is the correct explanation of Assertion.
- Assertion and Reason both are correct and Reason is not the correct explanation of Assertion.
- Assertion is correct but Reason is wrong.
- Assertion is wrong but Reason is correct.

41. **Assertion (A):** Lithium has the lowest electrode potential (reduction potential)

Reason (R): Lithium ion is the strongest oxidising agent

- Ⓐ a Ⓑ b Ⓒ c Ⓓ d

42. **Assertion (A):** Cu^{2+} ions get reduced more easily than H^+ ions.

Reason (R): Standard electrode potential of copper is 0.34 v.

- Ⓐ a Ⓑ b Ⓒ c Ⓓ d

43. **Assertion (A):** Magnetic moment values of actinoids are lesser than theoretically predicted values.

Reason (R): Actinoid elements are strongly paramagnetic.

- Ⓐ a Ⓑ b Ⓒ c Ⓓ d

44. **Assertion (A):** In transition elements ns orbital is filled up first and (n - 1) d afterwards, during ionization ns electrons are lost prior to (n - 1) d electron.

Reason (R): The effective nuclear charge felt by (n - 1) d electron is higher as compared to that by ns electron.

- Ⓐ a Ⓑ b Ⓒ c Ⓓ d

Case Base Question-I (Q.45-47)

Read the passage given below and answer the following questions :

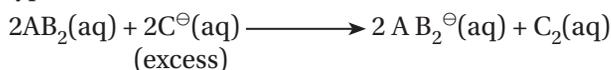
Transition-metal-carbonyl complexes are common organometallic reagents that feature metal-CO bonds. These complexes have proven to be powerful catalysts for various applications. By contrast, silicon-carbonyl complexes, organosilicon reagents poised to be eco-friendly alternatives for transition-metal carbonyls, have remained largely elusive. They have mostly been explored theoretically and/or through low temperature matrix isolation studies, but their instability had typically precluded isolation under ambient conditions. Here, we present the synthesis, isolation and full characterisation of stable silyl-substituted silicon-carbonyl complexes, along with bonding analysis. Initial reactivity investigations showed examples of CO liberation, which could be induced either thermally or photochemically, as well as substitution and functionalisation of the CO moiety. Importantly, the complexes exhibit strong $\text{Si} \rightarrow \text{CO}$ bonding, with $\text{Co} \rightarrow \text{Si}$ σ -donation and $\text{Si} \rightarrow \text{CO}$ π -back bonding, which is reminiscent of transition-metal carbonyls. This similarity between the abundant semi-metal

silicon and rare transition metals may provide new opportunities for the development of silicon-based catalysis.

45. Coordination compounds containing only carbonyl group as ligands are known as :
 (A) Heteroleptic carbonyls (B) Homoleptic carbonyls (C) Tetra carbonyls (D) Homomeric carbonyls
46. Shape of Tetracarbonylnickel (0) is :
 (A) Square planar (B) Trigonal pyramidal (C) Tetrahedral (D) Trigonal bipyramidal
47. The colour in the coordination compound better explained by :
 (A) Secondary valence theory (B) Coordination theory
 (C) Crystal field theory (D) Valence bond theory

Case Base Question- II (Q.48-50)

In a hypothetical reaction :



AB_2 oxidises C^{\ominus} ion in aqueous solution to C_2 and gets reduced to AB_2^{\ominus} . The order of the reaction with respect to AB_2 since concentration of C^{\ominus} is essentially constant is m .

$$\text{Rate} = K [AB_2]^m$$

48. Given below are the time and concentration of AB_2 taken :

Time (s)	AB_2 (M)
0.00	4.77×10^{-4}
1.00	4.31×10^{-4}
1.00	3.85×10^{-4}

Choose the correct answer :

- (A) 1.5 (B) 2 (C) 1 (D) 0
49. Determine rate constant of the reaction :
 (A) 0.1 (B) 0.2 (C) 0.3 (D) 0.4
50. Calculate half-life of the reaction (in seconds)
 (A) 6.93 (B) 3.465 (C) 13.1 (D) 24.4

Mathematics

51. $\int_0^1 \left(\prod_{r=1}^n (x+r) \right) \left(\sum_{k=1}^n \frac{1}{x+k} \right) dx$ equals to

- (A) n (B) $n!$ (C) $(n+1)!$ (D) $n \cdot n!$

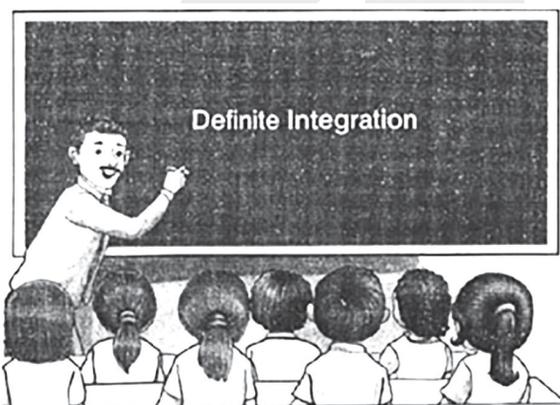
52. The area of the region bounded by the curve $y = \sqrt{16-x^2}$

- (A) 8π sq. units (B) 20π sq. units (C) 16π sq. units (D) 256π sq. units

53. $\int \frac{\sin^2 x \cos^2 x dx}{(\sin^5 x + \cos^3 x \sin^2 x + \sin^3 x \cos^2 x + \cos^5 x)^2}$ equals to
- (A) $\frac{1}{3(1+\tan^3 x)} + C$ (B) $\frac{-1}{3(1+\tan^3 x)} + C$ (C) $\frac{1}{1+\cot^3 x} + C$ (D) $\frac{-1}{1+\cot^3 x} + C$
54. The value of $\int \frac{dx}{x^2(x^4+1)^{3/4}}$
- (A) $\left(\frac{x^4+1}{x^4}\right)^{\frac{1}{4}} + C$ (B) $(x^4+1)^{\frac{1}{4}} + C$ (C) $-(x^4+1)^{\frac{1}{4}} + C$ (D) None of these
55. If $\int \frac{dx}{x^3(1+x^6)^{\frac{2}{3}}} = xf(x)(1+x^6)^{\frac{1}{3}} + C$ where, C is a constant of integration, then the function f(x) is equal to
- (A) $-\frac{1}{6x^3}$ (B) $-\frac{1}{2x^3}$ (C) $-\frac{1}{2x^2}$ (D) $-\frac{3}{x^3}$

CASE STUDY BASED QUESTION-I (Q.56-Q.58):

In Techno India Group Public School, mathematics teacher of XIIth class teaches the topic of definite integration.



For any function f(x), we have

$$\int_a^b f(x) dx = \int_a^{c_1} f(x) dx + \int_{c_1}^{c_2} f(x) dx + \dots + \int_{c_n}^b f(x) dx$$

where, $a < c_1 < c_2 < c_3 \dots < c_{n-1} < c_n < b$.

On basis of this information given in passage answer following questions.

56. $\int_0^{3/2} |4x-5| dx =$
- (A) $\frac{13}{10}$ (B) $\frac{13}{4}$ (C) $\frac{11}{10}$ (D) $\frac{11}{4}$
57. $\int_0^{2\pi} |\cos x| dx =$
- (A) 1 (B) 2 (C) 3 (D) 4

58. $\int_0^5 [x] dx =$

Ⓐ 10

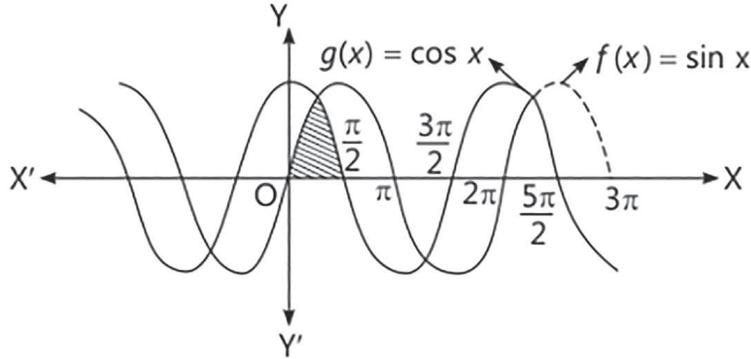
Ⓑ 14

Ⓒ 17

Ⓓ 20

CASE STUDY BASED QUESTION-II (Q.59-Q.61):

Graphs of two functions $f(x) = \sin x$ and $g(x) = \cos x$ is given below:



On basis of the above information answer the following questions.

59. In $[0, \pi]$ the curves $f(x) = \sin x$ and $g(x) = \cos x$ intersect at $x =$

Ⓐ $\frac{\pi}{2}$ Ⓑ $\frac{\pi}{3}$ Ⓒ $\frac{\pi}{4}$ Ⓓ π

60. The value of $\int_0^{\pi/4} \sin x \, dx$ is:

Ⓐ $1 - \frac{1}{\sqrt{2}}$ Ⓑ $1 + \frac{1}{\sqrt{2}}$ Ⓒ $2 - \frac{1}{\sqrt{2}}$ Ⓓ $2 + \frac{1}{\sqrt{2}}$

61. The value of $\int_{\pi/4}^{\pi/2} \cos x \, dx$ is:

Ⓐ $1 + \frac{1}{\sqrt{2}}$ Ⓑ $1 - \frac{1}{\sqrt{2}}$ Ⓒ $2 - \sqrt{2}$ Ⓓ $2 + \sqrt{2}$ **ASSERTION-REASON BASED QUESTIONS (Q.62- Q.65):**

DIRECTIONS: In each of the questions given below, there are two statements marked as Assertion (A) and Reason (R). Mark your answer as per the codes provided 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.

62. **Assertion (A):** The area bounded by the curve $y = 2 \cos x$ and the x -axis from $x = 0$ to $x = 2\pi$ is 8 sq. units.

Reason (R): The area bounded by the curve $y = \sin x$ between $x = 0$ and $x = 2\pi$ is 2 sq. units.

Ⓐ a

Ⓑ b

Ⓒ c

Ⓓ d

63. **Assertion (A):** $\int_{-\pi/3}^{\pi/3} \frac{(3+4x^3)dx}{2-\cos\left(x+\frac{\pi}{3}\right)} = 4\sqrt{3} \tan^{-1}\left(\frac{1}{2}\right)$

71. Let $f(x) = \int x^3 \sqrt{3-x^2} dx$. If $5f(\sqrt{2}) = -4$, then $f(1)$ is equal to
- (A) $-\frac{6\sqrt{2}}{5}$ (B) $-\frac{8\sqrt{2}}{5}$ (C) $-\frac{2\sqrt{2}}{5}$ (D) $-\frac{4\sqrt{2}}{5}$
72. The integral $\int_0^\pi \frac{(x+3)\sin x}{1+3\cos^2 x} dx$ is equal to
- (A) $\frac{\pi}{\sqrt{3}}(\pi+1)$ (B) $\frac{\pi}{3\sqrt{3}}(\pi+6)$ (C) $\frac{\pi}{\sqrt{3}}(\pi+2)$ (D) $\frac{\pi}{2\sqrt{3}}(\pi+4)$
73. The integral $\int_0^\pi \frac{8x dx}{4\cos^2 x + \sin^2 x}$ is equal to
- (A) $2\pi^2$ (B) $4\pi^2$ (C) π^2 (D) $\frac{3\pi^2}{2}$
74. If the area of the larger portion bounded between the curves $x^2 + y^2 = 25$ and $y = |x - 1|$ is $\frac{1}{4}(b\pi + c)$, $b, c \in \mathbb{N}$, then $b + c$ is equal to _____.
- (A) 75 (B) 77 (C) 70 (D) 78
75. The area of the region bounded by the curves $x(1 + y^2) = 1$ and $y^2 = 2x$ is:
- (A) $\frac{\pi}{4} - \frac{1}{3}$ (B) $\frac{\pi}{2} - \frac{1}{3}$ (C) $2\left(\frac{\pi}{2} - \frac{1}{3}\right)$ (D) $\frac{1}{2}\left(\frac{\pi}{2} - \frac{1}{3}\right)$

Biology

76. Female gametophyte of angiosperms is represented by:
- (A) Ovule (B) Megaspore mother cell (C) Embryo sac (D) Nucellus
77. Male gametophyte of angiosperms/monocots is :
- (A) Microsporangium (B) Nucellus (C) Microspore (D) Stamen
78. If there are 4 pollen mother cells in anthers, what will be the number of pollen grains?
- (A) 16 (B) 12 (C) 8 (D) 4
79. Bartholin's glands are situated :
- (A) On the sides of the head of some amphibians. (B) At the reduced tail end of birds.
(C) On either side of vagina in humans. (D) On either side of vas deferens in humans.
80. In the 28 day human ovarian cycle, ovulation occurs typically on :
- (A) Day 14 of the cycle. (B) Day 28 of the cycle. (C) Day 1 of the cycle. (D) Day 5 of the cycle.
81. Select the correct option:
- (A) IUI can help a woman with premature menopause to bear a child.
(B) GIFT involves IVF to help women, who cannot produce ovum, to bear a child.

- © ZIFT involves IVF to help women, who cannot produce ovum, to bear a child.
- © ZIFT involves IVF to help women, who have damaged fallopian tubes, to bear a child.

82. In context of amniocentesis, which of the following statements is incorrect?

- Ⓐ It is usually done when a woman is between 14-16 weeks pregnant.
- Ⓑ It is used for prenatal sex determination.
- Ⓒ It can be used for detection of Down's syndrome.
- Ⓓ It can be used for detection of cleft palate.

83. An abnormal human baby with 'XXX' sex chromosome, was born due to:

- Ⓐ Fusion of two ova and one sperm
- Ⓑ Fusion of one ovum and two sperms
- Ⓒ Formation of abnormal sperms in the father.
- Ⓓ Formation of abnormal ova in the mother.

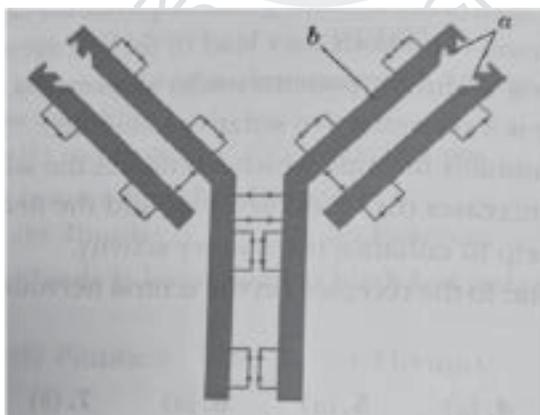
84. A gene showing co dominance has:

- Ⓐ Alleles tightly linked on the same chromosome.
- Ⓑ Alleles which are recessive to each other.
- Ⓒ Both alleles are independently expressed in the heterozygote.
- Ⓓ One allele dominates the other.

85. Out of 64 codons, 61 codons code for 20 types of amino acids. It is called:

- Ⓐ Degeneracy of genetic code
- Ⓑ Overlapping of gene
- Ⓒ Wobbling of codon
- Ⓓ Universality of codon

86. Identify 'a' and 'b' in the given diagram.



- Ⓐ Antigen binding site and Heavy chain, respectively
- Ⓑ Antigen binding site and Light chain, respectively
- Ⓒ Disulphide bond and Heavy chain, respectively
- Ⓓ Disulphide bond and Light chain, respectively

87. Name two intermediate hosts, which the human liver fluke depends on to complete its life cycle, so as to facilitate parasitisation of its primary host?

- Ⓐ Snail and fish
- Ⓑ Crab and snake
- Ⓒ Mosquito and rat
- Ⓓ Any one of the above pairs

88. Variations during mutations of meiotic recombinations are
 (A) random and directionless (B) random and directional
 (C) random and small (D) random, small and directional
89. Speciation usually occurs ____ .
 (A) suddenly
 (B) by genetic drift
 (C) when populations are geographically isolated
 (D) when populations are not geographically isolated
90. Fossil X is older than Fossil Y because:
 (A) Fossil Y is found in deeper sedimentation.
 (B) Fossil X is found in deeper sedimentation.
 (C) Fossil Y has some vestigial organs which were functional in X.
 (D) Fossil Y shares homology and analogy with X.

Assertion and Reason: (Q. 91 to Q. 94)

Directions: The questions 16 to 19 have two statements – Assertion (A) and Reason (R). Of the two statements, mark the correct answer from the options given below:

- 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.

91. **Assertion (A):** Corpus luteum in pregnancy has a long life.

Reason (R): If fertilisation does not occur, it remains active only for 10-12 days.

- (A) A (B) B (C) C (D) D

92. **Assertion (A):** – Implants act as effective methods of contraception in human females.

Reason (R): Implants work by inhibiting ovulation/implantation.

- (A) A (B) B (C) C (D) D

93. **Assertion (A):** Both DNA and RNA have the ability to direct their duplications.

Reason (R): The genetic material is DNA, neither RNA nor proteins.

- (A) A (B) B (C) C (D) D

94. **Assertion (A):** When more than one adaptive radiation appear to have occurred in an isolated geographical area and two or more groups of unrelated animals come to resemble each other for similar mode of life or habitat, it is convergent evolution.

Reason (R): Similarities in biochemicals, such as DNA, help in deriving the line of evolution.

- (A) A (B) B (C) C (D) D

Case Base Question (Q.95 to Q.97)

Read the given passage and answer the following questions (20-22):

Galapagos Islands lie in the Pacific Ocean, about 600 miles west of South America across the equator. It is a group of fifteen volcanic islands. Here Darwin found a living laboratory of evolution. The flora and fauna of these islands resemble those of South American mainland, with which the Galapagos Islands were once connected. Birds of Galapagos Islands are called Darwin's finches.

95. Which evidence of evolution is related to Darwin's finches?
Ⓐ Evidences from biogeographical distribution Ⓑ Evidences from comparative anatomy
Ⓒ Evidences from embryology Ⓓ Evidences from palaeontology
96. The diversity in the types of beaks of finches adapted to different feeding habits on the Galapagos Islands, as observed by Darwin, provides evidence for
Ⓐ Intraspecific competition Ⓑ Interspecific competition
Ⓒ Origin of species by Natural Selection Ⓓ Intraspecific variations
97. Similarities in organisms in different genotypes indicates:
Ⓐ Parallel evolution Ⓑ Adaptive radiation Ⓒ Convergent evolution Ⓓ Divergent evolution

Case Base Question (Q.98 to Q.100)

Read the given passage and answer the following questions (23-25) :

Cancer is defined as an uncontrolled division or proliferation of cells without ant differentiation. The cancer cells do not require extracellular growth factors. Due to repeated division, cells form a large mass of tissue, called tumour.

98. In malignant tumours, the cells proliferate, grow rapidly and move to other parts of the body to form new tumours. This stage of disease is called
Ⓐ metagenesis Ⓑ metastasis Ⓒ teratogenesis Ⓓ None of the above
99. Carcinoma refers to
Ⓐ Malignant tumours of the connective tissue. Ⓑ Malignant tumours of the skin or mucous membrane
Ⓒ Malignant tumours of the colon Ⓓ Benign tumour of the connective tissue
100. Cancerous cells can easily be destroyed by radiations due to:
Ⓐ Rapid cell division Ⓑ Lack of nutrition Ⓒ Fast mutation Ⓓ Lack of oxygen