

03/09/2025

Code-A



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MM : 720

Term Exam for NEET-2026_CF+OYM(P1)-TE03A (Class-XI & XII)

Time : 180 Min.

Topics Covered:

Physics: Electromagnetic Induction, Alternating Current, Electromagnetic Waves, Work, Energy & Power, System of Particles & Rotational Motion

Chemistry: Coordination Compounds, Haloalkanes and Haloarenes, Organic Chemistry : Some Basic Principles & Techniques

Botany: Molecular Basis of Inheritance, Cell Cycle & Cell Division

Zoology: Evolution, Excretory Products & their Elimination, Locomotion & Movement

General Instructions :

Duration of Test is 3 hrs.

The Test consists of 180 questions. The maximum marks are 720.

There are four parts in the question paper consisting of Physics, Chemistry, Botany and Zoology having 45 questions in each part of equal weightage.

Each question carries +4 marks. For every wrong response, -1 mark shall be deducted from the total score. Unanswered/unattempted questions will be given no marks.

Use blue/black ballpoint pen only to darken the appropriate circle.

Mark should be dark and completely fill the circle.

Dark only one circle for each entry.

Dark the circle in the space provided only.

Rough work must not be done on the Answer sheet and do not use white fluid or any other rubbing material on the Answer sheet.

PHYSICS

- If V_0 and I_0 are peak voltage and peak current respectively in a purely inductive circuit, then power consumption by the inductor in long time will be
 - $V_0 I_0$
 - $\sqrt{2} V_0 I_0$
 - Zero
 - $\frac{V_0 I_0}{2}$
- For a series LCR circuit,
 - Voltage across L and R differ by $\frac{\pi}{2}$ phase
 - Current through C and R are in same phase
 - Voltage across C and current through L differ by $\frac{\pi}{2}$ phase
 The correct option with regard to above statements is
 - Only (a) is true
 - Only (a) and (b) are true
 - Only (b) and (c) are true
 - (a), (b) and (c) are true
- The magnetic field of an electromagnetic wave travelling through vacuum is given by $B = B_0 \sin(kx + \omega t)$. The quantity that gives us velocity of wave is
 - $k\omega$
 - $\frac{k}{\omega}$
 - $\frac{\omega}{k}$
 - $\frac{k^2}{\omega^2}$
- The instantaneous value of emf and current in an AC circuit are; $E = 5\sqrt{2} \sin\left(200\pi t - \frac{\pi}{3}\right)$, $I = \frac{1}{\sqrt{2}} \sin(200\pi t)$
The impedance of the circuit will be??
 - 0.1Ω
 - 1Ω
 - 10Ω
 - 0.01Ω

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5. **Assertion (A):** Electromagnetic waves can be deflected by magnetic or electric field.

Reason (R): Electromagnetic waves consist of charged particles.

- (1) Both (A) and (R) are true and (R) is the correct explanation of (A)
 (2) Both (A) and (R) are true but (R) is not the correct explanation of (A)
 (3) (A) is true but (R) is false
 (4) Both (A) and (R) are false

6. When a plane electromagnetic wave travels in vacuum the average electric field energy density is given by (here E_0 is the amplitude of the electric field of the wave)

- (1) $\frac{1}{4}\epsilon_0 E_0^2$
 (2) $\frac{1}{2}\epsilon_0 E_0^2$
 (3) $\epsilon_0 E_0^2$
 (4) $2\epsilon_0 E_0^2$

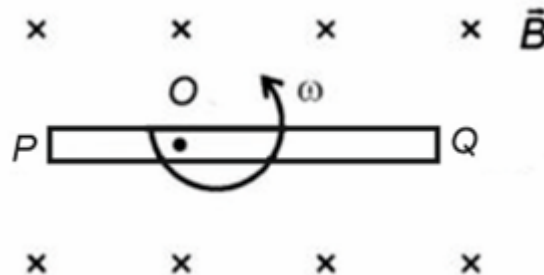
7. The value of inductance L for which the current is maximum in a series LCR circuit with $C = 10 \mu\text{F}$ and $\omega = 1000 \text{ s}^{-1}$ is

- (1) 1 mH
 (2) 10 mH
 (3) 100 mH
 (4) 1000 mH

8. A step-down transformer connected to an AC mains supply of 220 V is made to operate at 11V, 44 W lamp. Ignoring power losses in the transformer, what is the current in the primary circuit?

- (1) 4 A
 (2) 0.2 A
 (3) 0.4 A
 (4) 2 A

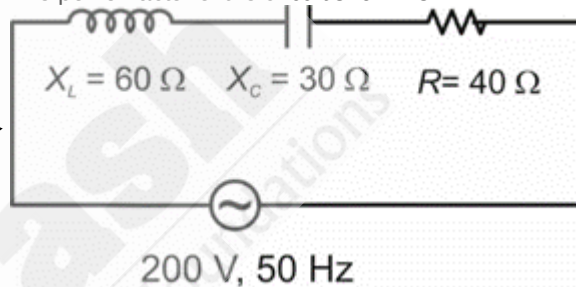
9. A conducting rod PQ of length $4L$ is rotating about a point O in a uniform magnetic field \vec{B} directed into the paper as shown in the figure. Given that $PO = L$ and $OQ = 3L$, then



Potential difference between ends P and Q is

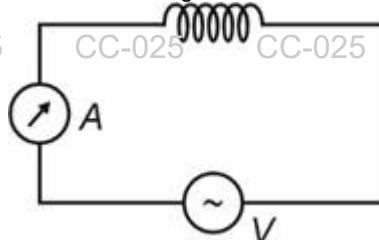
- (1) $\frac{1}{2}B\omega L^2$
 (2) $4B\omega L^2$
 (3) $\frac{1}{4}B\omega L^2$
 (4) $\frac{9}{2}B\omega L^2$

10. The power factor of the circuit shown is



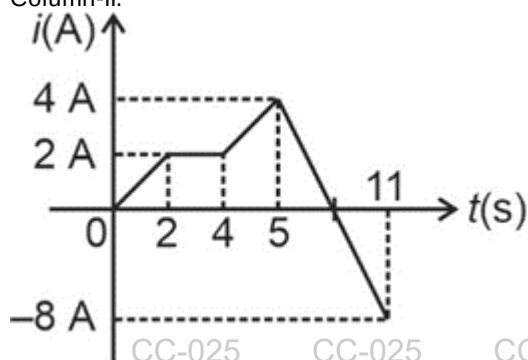
- (1) $\frac{3}{4}$
 (2) $\frac{4}{3}$
 (3) $\frac{3}{5}$
 (4) $\frac{4}{5}$

11. In the given circuit an inductor is connected across an AC source. If applied voltage is $V = 50\sqrt{2}\sin(100\pi t)$ volt and ammeter reading is 2A, then the value of L is



- (1) $\frac{1}{\pi} \text{ H}$
 (2) $\frac{1}{2\pi} \text{ H}$
 (3) $\frac{1}{4\pi} \text{ H}$
 (4) $\pi \text{ H}$

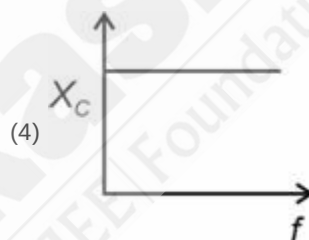
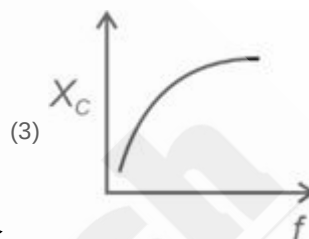
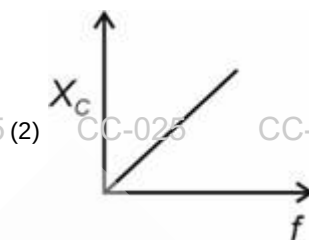
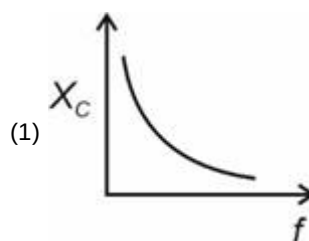
12. The following graph represents variation of current through an inductor of inductance $L = 4 \text{ mH}$, as a function of time. Match the conditions given in Column-I with appropriate time intervals, in which they are met, as per entries in Column-II.



Column-I	Column-II
(A) Induced emf is zero	(P) 0 s to 2 s
(B) Induced emf is negative	(Q) 2 s to 4 s
(C) Induced emf is positive	(R) 4 s to 5 s
(D) Induced emf has maximum magnitude	(S) 5 s to 11 s

- (1) $A \rightarrow Q$; $B \rightarrow P, R$; $C \rightarrow S$; $D \rightarrow R, S$
 (2) $A \rightarrow P, R$; $B \rightarrow Q$; $C \rightarrow S$; $D \rightarrow R, S$
 (3) $A \rightarrow Q$; $B \rightarrow P, R$; $C \rightarrow R, S$; $D \rightarrow S$
 (4) $A \rightarrow R, S$; $B \rightarrow P, R$; $C \rightarrow S$; $D \rightarrow Q$

13. For an a.c. circuit connected to a capacitor, choose the curve between capacitive reactance X_C and source frequency f



14. In an a.c. circuit V and I are given by $V = 50\sin(100\pi t)$ volt, $I = 100\sin\left[100\pi t + \frac{\pi}{3}\right]$ mA. The average power dissipated in the circuit is

- (1) 2.5 W
 (2) 5 W
 (3) 0.5 W
 (4) 1.25 W

15. An inductor having inductance 4 mH carrying current I given by $I = (2t + 3t^2)$ A, where t is time in s. The magnitude of emf induced in the coil at $t = 2$ s will be

- (1) 24 mV
 (2) 48 mV
 (3) 56 mV
 (4) 12 mV

16. The magnitude of slope of magnetic flux versus time graph is equal to

(1) Charge
(2) Energy
(3) Induced emf
(4) Induced charge

17. A capacitor of capacitance 'C', is connected across an ac source of voltage V , given by $V = V_0 \sin \omega t$

The displacement current between the plates of the capacitor, would then be given by

(1) $I_d = V_0 \omega C \sin \omega t$

(2) $I_d = V_0 \omega C \cos \omega t$

(3) $I_d = \frac{V_0}{\omega C} \cos \omega t$

(4) $I_d = \frac{V_0}{\omega C} \sin \omega t$

18. If the number of turns per unit length as well as the length of a solenoid are doubled, the self-inductance of solenoid will

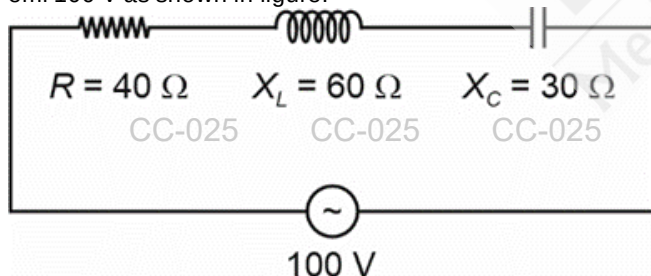
(1) Remain unchanged
(2) Becomes eight times
(3) Becomes doubled
(4) Becomes four times

19. The flux through a circular conducting coil of resistance 20Ω is varying with time (t) as

$\phi = 5t^2$ Wb. The magnitude of induced current in the loop at time $t = 1$ s is

(1) 0.5 A
(2) 1 A
(3) 0.25 A
(4) 10 A

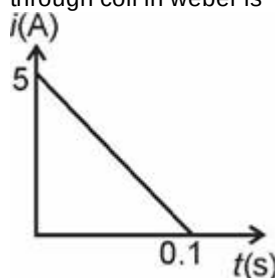
20. A series LCR circuit is connected across an AC source of emf 100 V as shown in figure.



Current flowing in the circuit will be of amplitude

(1) 2 A
(2) $\frac{1}{\sqrt{2}}$ A
(3) $2\sqrt{2}$ A
(4) $\frac{1}{2\sqrt{2}}$ A

21. Magnetic flux changes in a coil of resistance 10Ω . As a result an induced current is developed in it, which varies with time as shown. The magnitude of change in flux through coil in weber is



(1) 2

(2) 2.5

(3) 4

(4) 6

22. Light wave is travelling along positive y -direction. If the corresponding electric field at any time is along the $+x$ -axis, then direction of corresponding magnetic field at that time is along

(1) $+y$ -axis

(2) $-x$ -axis

(3) $+z$ -axis

(4) $-z$ -axis

23. Instantaneous displacement current of 1.0 A in the space between the parallel plates of $1 \mu\text{F}$ capacitor can be established by changing the potential difference at the rate of

(1) 10^{-6} V s^{-1}

(2) 10^6 V s^{-1}

(3) 1 V s^{-1}

(4) 0.1 V s^{-1}

24. Quality factor and power factor both have the dimensions of

(1) Time

(2) Frequency

(3) Force

(4) Angle

25. A bulb and a capacitor are connected in series to a source of alternating emf. Its frequency is decreased while keeping the voltage of source constant then brightness of bulb will

(1) Increases

(2) Decreases

(3) Remain same

(4) Can't say

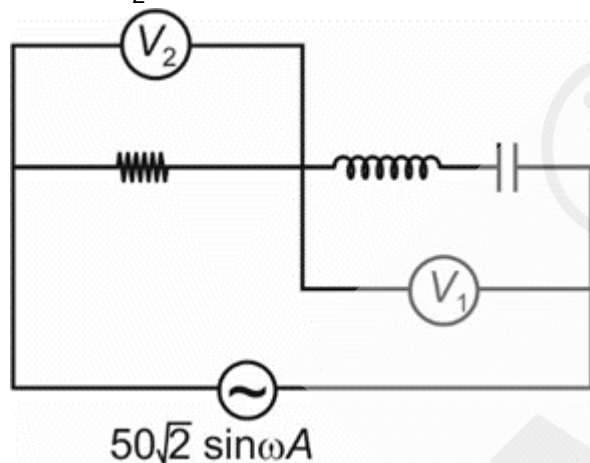
26. An AC voltage is given as $e = e_1 \sin \omega t + e_2 \cos \omega t$. The RMS value of this voltage

- (1) $\frac{\sqrt{e_1^2 + e_2^2}}{2}$
 (2) $\frac{e_1 + e_2}{2}$
 (3) $\sqrt{\frac{e_1^2 + e_2^2}{2}}$
 (4) $\frac{e_1 + e_2}{\sqrt{2}}$

27. Which component of electromagnetic spectrum have minimum frequency?

- (1) Radio wave
 (2) X-Rays
 (3) Gamma rays
 (4) Visible light

28. If the reading of voltmeter V_1 is 40 V, what is the reading of voltmeter V_2 ?



- (1) 10 V
 (2) 20 V
 (3) 30 V
 (4) 40 V

29. The electric field component of an electromagnetic wave in a medium is represented by

$$E_x = 0;$$

$$E_y = 2.5 \frac{\text{N}}{\text{C}} \cos \left[\left(2\pi \times 10^6 \frac{\text{rad}}{\text{s}} \right) t - \left(\pi \times 10^{-2} \frac{\text{rad}}{\text{m}} \right) x \right]$$

$$E_z = 0.$$

The wave is

- (1) Moving along X-direction with frequency 10^6 Hz and wavelength 100 m
 (2) Moving along X-direction with frequency 10^6 Hz and wavelength 200 m
 (3) Moving along Y-direction with frequency 10^6 Hz and wavelength 200 m
 (4) Moving along Y-direction with frequency $2\pi \times 10^6$ Hz and wavelength 200 m

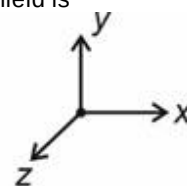
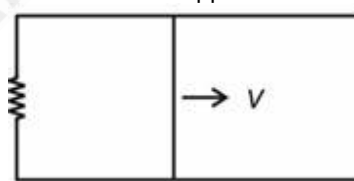
30. The average power dissipation in pure capacitor in one complete cycle of AC is

- (1) $\frac{1}{2} C i^2$
 (2) $C i^2$
 (3) $\frac{1}{4} C i^2$
 (4) Zero

31. The rms value of current for an a.c. current given by $I = 4 + 3 \cos(\omega t)$ is

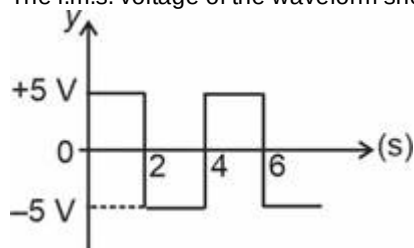
- (1) 5 A
 (2) 4.17 A
 (3) 4.53 A
 (4) 4.23 A

32. When a conducting wire is moved towards positive x-axis on a fixed wire rails, a current flows in clockwise direction. The direction of applied uniform magnetic field is



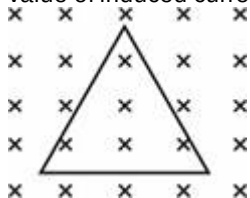
- (1) Towards positive x-axis
 (2) Towards positive y-axis
 (3) Towards positive z-axis
 (4) Towards negative z-axis

33. The r.m.s. voltage of the waveform shown is



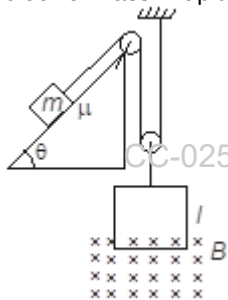
- (1) 5 V
- (2) 10 V
- (3) 15 V
- (4) 20 V

34. An equilateral triangle of side length ' l ' is placed in magnetic field which is varying with time as $\frac{dB}{dt} = K$. If the resistance per unit length of triangular wire is ρ , then the value of induced current is



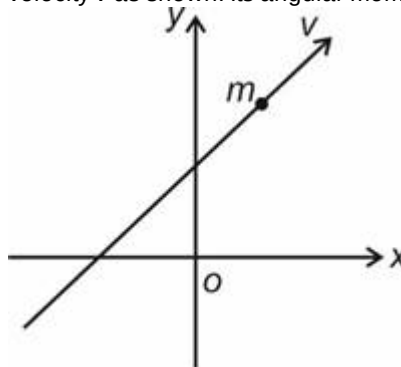
- (1) $\frac{Kl}{3\rho}$
- (2) $\frac{4Kl}{3\sqrt{3}\rho}$
- (3) $\frac{\sqrt{3}Kl}{4\rho}$
- (4) $\frac{Kl}{4\sqrt{3}\rho}$

35. A massless square loop of side l carrying current i is suspended from a pulley as shown in the arrangement. Lower edge of the loop is in transverse magnetic field \vec{B} . The minimum current i required in the loop to just move the block of mass m up the inclined plane is



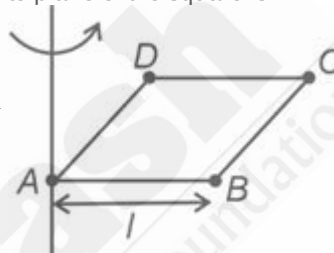
- (1) $\frac{mg \sin \theta + \mu mg \cos \theta}{Bl}$
- (2) $\frac{mg \sin \theta - \mu mg \cos \theta}{Bl}$
- (3) $\frac{2mg \sin \theta + 2\mu mg \cos \theta}{Bl}$
- (4) $\frac{mg \sin \theta + \mu mg \cos \theta}{2Bl}$

36. A particle of mass m is moving in x-y plane with constant velocity v as shown. Its angular momentum about the origin



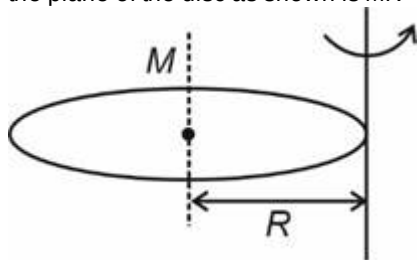
- (1) Remains constant
- (2) Must increase
- (3) Must decrease
- (4) May increase or decrease

37. Four point masses each of value m , are fixed at the corners of a square $ABCD$ of side l . The moment of inertia of this system about an axis passing through A and perpendicular to plane of the square is

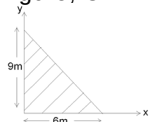


- (1) $2ml^2$
- (2) $3ml^2$
- (3) $4ml^2$
- (4) $5ml^2$

38. Moment of inertia of a uniform disc of mass M and radius R about an axis passing through its rim and perpendicular to the plane of the disc as shown is MK^2 , where K is



- (1) $\sqrt{\frac{3}{2}} R$
 (2) $\sqrt{\frac{5}{2}} R$
 (3) $\frac{\sqrt{3}R}{2}$
 (4) $\frac{\sqrt{5}R}{2}$
39. Centre of mass position of triangular plate as shown in figure, is



- (1) (2, 3)
 (2) (1, 3)
 (3) (2, 1)
 (4) (2, 6)
40. Two identical particles are moving with speed v and $\sqrt{3}v$ in perpendicular directions. The speed of their centre of mass is
- (1) $2v$
 (2) v
 (3) $\frac{\sqrt{3}v}{2}$
 (4) $2\sqrt{3}v$

41. Which among the following statements is true?

- (1) Work done by frictional force on a body is always positive
 (2) Work done by frictional force on a body is always negative
 (3) Work done by frictional force on a body is always zero
 (4) Work done by frictional force on a body may be positive, negative or zero

42. A sports bike having mass 200 kg is driven with acceleration of 5 ms^{-2} on a rainy track and against a constant external resistive force 60 N due to air. When the speed of bike is 108 km/h, then the rate at which the engine of sports bike is doing work will be

- (1) 62,400 W
 (2) 22,400 W
 (3) 16,900 W
 (4) 31,800 W

43. A small mass ' m ' is moved in a vertical circle of radius ' r ' with the help of a string. The velocity of the mass is $\sqrt{9gr}$ at the lowest point. Tension in the string when the mass is at its highest position is

- (1) $10mg$
 (2) $4mg$
 (3) $6mg$
 (4) Zero

44. A body of mass 10 kg is raised from ground. If work done by external force in raising it by 10 m is 1600 J, its velocity at this position will be ($g = 10 \text{ m/s}^2$)

- (1) $\sqrt{30} \text{ m/s}$
 (2) $4\sqrt{30} \text{ m/s}$
 (3) $\frac{1}{2}\sqrt{30} \text{ m/s}$
 (4) $2\sqrt{30} \text{ m/s}$

45. If momentum of a body increases by 30%, then percentage increase in its KE will be

- (1) 30%
 (2) 39%
 (3) 69%
 (4) 35%

CHEMISTRY

46. Match the following

Column-I

Column-II

- a. $[\text{Cr}(\text{NH}_3)_5\text{Cl}]\text{Br}$ (i) Coordination isomerism
 b. $[\text{PtCl}_2(\text{NH}_3)_2]$ (ii) Ionisation isomerism
 c. $[\text{Co}(\text{en})_3][\text{Cr}(\text{ox})_3]$ (iii) Optical isomerism
 d. $[\text{Co}(\text{C}_2\text{O}_4)_3]^{3-}$ (iv) Geometrical isomerism

The correct match is

- (1) a(iv), b(ii), c(iii), d(i)
 (2) a(ii), b(iv), c(i), d(iii)
 (3) a(iv), b(ii), c(i), d(iii)
 (4) a(ii), b(iii), c(i), d(iv)

47. Heteroleptic complex among the following is

- (1) $\text{K}_2[\text{Zn}(\text{OH})_4]$
 (2) $\text{Hg}[\text{Co}(\text{SCN})_4]$
 (3) $[\text{Pt}(\text{NH}_3)_2\text{Cl}(\text{NO}_2)]$
 (4) $\text{K}_3[\text{Fe}(\text{CN})_6]$

48. Given below are the two statements.

Statement-I: Complex $[\text{Co}(\text{NH}_3)_4\text{Cl}_2]^+$ shows geometrical isomerism.

Statement-II: $\text{trans-}[\text{Co}(\text{NH}_3)_4\text{Cl}_2]^+$ is optically active species.

In light of the above statements, choose the correct answer

- (1) Statement-I is correct but statement-II is incorrect
 (2) Both statement-I and statement-II are correct
 (3) Both statement-I and statement-II are incorrect
 (4) Statement-I is incorrect but statement-II is correct

49. IUPAC name of the given compound is $\text{K}_3[\text{Al}(\text{C}_2\text{O}_4)_3]$

- (1) Potassium trioxalatoaluminium (III)
 (2) Potassium trisoxalatoaluminium (III)
 (3) Potassium trioxalatoaluminate (II)
 (4) Potassium trioxalatoaluminate (III)

50. The ambidentate ligand among the following is

- (1) CO
 (2) $\text{C}_2\text{O}_4^{2-}$
 (3) NO_2^-
 (4) NH_2^-

51. Given below are two statements one is labelled as **Assertion (A)** and the other is labelled as **Reason (R)**.

Assertion (A): Geometrical isomerism is not possible in tetrahedral complexes.

Reason (R): In tetrahedral complexes, the relative positions of the ligands attached to the central metal atom are the same with respect to each other.

In the light of above statements, choose the correct option among the following.

- (1) (A) is true, (R) is false
 (2) Both (A) and (R) are true and (R) is the correct explanation of (A)
 (3) (A) is false, (R) is true
 (4) Both (A) and (R) are true but (R) is not the correct explanation of (A)

52. One mole of which octahedral complex of cobalt will give 2 moles of AgCl as precipitate when reacts with excess of silver nitrate solution?

- (1) $\text{CoCl}_3 \cdot 6\text{NH}_3$
 (2) $\text{CoCl}_3 \cdot 4\text{NH}_3$
 (3) $\text{CoCl}_3 \cdot 5\text{NH}_3$
 (4) $\text{CoCl}_3 \cdot 3\text{NH}_3$

53. Consider the following statements about metal carbonyls

- (a) The metal-carbon bond in metal carbonyls possess both σ and π character.
 (b) The metal to ligand bonding creates a synergic effect which strengthens the bond between CO and the metal.
 (c) M-C π bond is formed by the donation of lone pair of electrons on the carbonyl carbon into the vacant orbital of the metal.

The correct statements are

- (1) (a) and (c) only
 (2) (b) and (c) only
 (3) (a) and (b) only
 (4) (a), (b) and (c)

54. The hybridization and geometry of $[\text{Co}(\text{NH}_3)_6]^{3+}$ ion respectively are

- (1) d^2sp^3 , Octahedral
 (2) sp^3d^2 , Square planar
 (3) dsp^2 , Square planar
 (4) sp^3 , Tetrahedral

55. Match List-I with List-II.

List-I Complex ion	List-II Spin only Magnetic moment (BM)
(a) $[\text{Co}(\text{NH}_3)_6]^{3+}$	(i) $\sqrt{8}$
(b) $[\text{NiCl}_4]^{2-}$	(ii) $\sqrt{3}$
(c) $[\text{CoF}_6]^{3-}$	(iii) 0
(d) $[\text{Fe}(\text{CN})_6]^{3-}$	(iv) $\sqrt{24}$

The correct match is

- (1) a(ii), b(iv), c(iii), d(i)
 (2) a(iii), b(i), c(iv), d(ii)
 (3) a(i), b(iii), c(ii), d(iv)
 (4) a(ii), b(iii), c(iv), d(i)

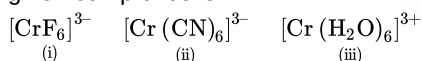
56. The correct order of increasing field strength of ligands to form co-ordination compounds is

- (1) $\text{NH}_3 < \text{en} < \text{CN}^- < \text{edta}^{4-}$
 (2) $\text{CN}^- < \text{en} < \text{NH}_3 < \text{edta}^{4-}$
 (3) $\text{CN}^- < \text{edta}^{4-} < \text{en} < \text{NH}_3$
 (4) $\text{edta}^{4-} < \text{NH}_3 < \text{en} < \text{CN}^-$

57. Crystal field stabilization energy for high spin d^6 octahedral complex is (ignoring pairing energy)

- (1) $-2.4 \Delta_0$
 (2) $-1.6 \Delta_0$
 (3) $-1.2 \Delta_0$
 (4) $-0.4 \Delta_0$

58. Correct order for the wavelengths of absorption for the given complexes is



- (1) (ii) > (iii) > (i)
 (2) (i) > (iii) > (ii)
 (3) (ii) > (i) > (iii)
 (4) (iii) > (ii) > (i)

59. Consider the following statements

- (a) Hexacarbonyl chromium (0) is octahedral in shape
 (b) Decacarbonyldimanganese (0) is made up of two square pyramidal $\text{Mn}(\text{CO})_5$ units joined by a Mn-Mn bond
 (c) Octacarbonyldicobalt (0) has a Co-Co bond bridged by four CO groups

The correct statements are

- (1) (a) and (b) only
 (2) (b) and (c) only
 (3) (a) and (c) only
 (4) (a), (b) and (c)

60. Wilkinson's catalyst among the following is

- (1) $[(\text{Ph}_3\text{P})_3\text{RhCl}]$
 (2) $\text{K}[\text{Au}(\text{CN})_2]$
 (3) $\text{K}_2[\text{Pt}(\text{CN})_4]$
 (4) $\text{cis-}[\text{PtCl}_2(\text{NH}_3)_2]$

61. The correct relation between Δ_t and Δ_0 is

- (1) $\Delta_t = \frac{4}{9} \Delta_0$
 (2) $\Delta_t = \frac{2}{3} \Delta_0$
 (3) $\Delta_0 = 2 \Delta_t$
 (4) $\Delta_0 = \frac{4}{9} \Delta_t$

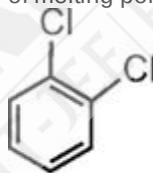
62. Consider the following statements about $[\text{Co}(\text{en})_3]\text{Cl}_3$

- (a) Cobalt has 3 primary valences and 6 secondary valences.
 (b) It is diamagnetic in nature.
 (c) Cobalt has sp^3d^2 hybridisation.
 (d) Cobalt has $t_{2g}^6 e_g^0$ configuration.

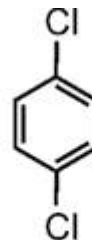
The correct statements are

- (1) (a) and (c) only
 (2) (a), (b) and (c) only
 (3) (b) and (c) only
 (4) (a), (b) and (d) only

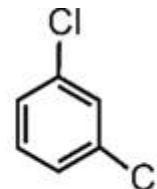
63. Arrange the following compounds in their decreasing order of melting point.



I



II



III

- (1) I > II > III
 (2) III > I > II
 (3) II > I > III
 (4) II > III > I

64. Which of the following has highest dipole moment?

- (1) $\text{CH}_3 - \text{F}$
 (2) $\text{CH}_3 - \text{Cl}$
 (3) $\text{CH}_3 - \text{Br}$
 (4) $\text{CH}_3 - \text{I}$









65. Which of the following is not a polar protic solvent?

- (1) H_2O
- (2) CH_3OH
- (3) CH_3COOH
- (4) CCl_4

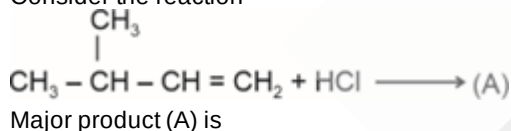
66. Total number of compounds (including stereoisomers) obtained on monochlorination of 2-methylpentane is

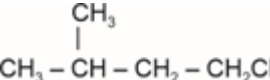
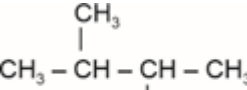
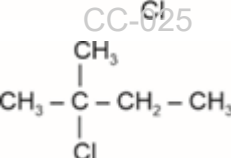
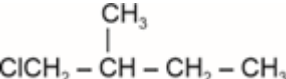
- (1) 9
- (2) 8
- (3) 6
- (4) 7

67. Allylic and Vinylic chloride respectively are

- (1)  and 
- (2)  and 
- (3)  and 
- (4)  and 

68. Consider the reaction

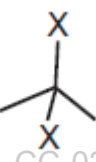
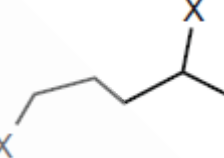
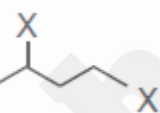
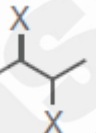


- (1) 
- (2) 
- (3) 
- (4) 

69. $\text{CH}_3\text{CH}_2\text{Cl} + \text{NaI} \xrightarrow{\text{dry Acetone}} \text{CH}_3\text{CH}_2\text{I} + \text{NaCl}$
The reaction is known as

- (1) Finkelstein reaction
- (2) Swarts reaction
- (3) Hunsdiecker reaction
- (4) HVZ reaction

70. Which of the following is geminal dihalide?

- (1) 
- (2) 
- (3) 
- (4) 

71. Chloroform is stored in closed dark coloured bottles completely filled to avoid its slow oxidation in the presence of light and air. The extremely poisonous gas formed during this reaction is

- (1) Acetylene
- (2) Chlorine
- (3) Carbon monoxide
- (4) Phosgene

72. Given below are two statements

Statement I: Ethyl chloride reacts with KCN to form methylisocyanide as a major product.

Statement II: Ethyl chloride reacts with KNO_2 to form ethyl nitrite as a major product.

In the light of above statements, choose the most appropriate answer from the option given below.

- (1) Statement I is correct but statement II is incorrect
- (2) Statement I is incorrect but statement II is correct
- (3) Both statement I and statement II are correct
- (4) Both statement I and statement II are incorrect

73. Which one is most reactive towards S_N1 reaction?

- (1) $\text{CH}_3\text{CH}_2\text{Br}$
- (2) $(\text{CH}_3)_2\text{CHBr}$
- (3) $(\text{C}_6\text{H}_5)_3\text{CBr}$
- (4) $(\text{C}_6\text{H}_5)_3\text{CCH}_2\text{Br}$

74. Consider the following statements.

Statement (I) : Haloarenes are less reactive than haloalkanes towards nucleophilic substitution reaction.

Statement (II) : In haloarenes, the electron pairs on halogen atom are in conjugation with π -electrons of the ring.

In the light of above statements, choose the correct option.

- (1) Statement (I) is correct but Statement (II) is incorrect
- (2) Statement (I) is incorrect but Statement (II) is correct
- (3) Both Statement (I) and Statement (II) are correct
- (4) Both Statement (I) and Statement (II) are incorrect

75. Given below are the two statements

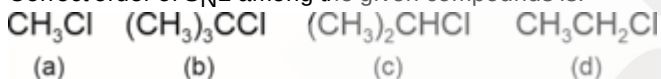
Statement I: The stereoisomers related to each other as non-superimposable mirror images are called enantiomers.

Statement II: A mixture containing two enantiomers in equal proportions will have zero optical rotation.

In light of above statements, choose the correct answer.

- (1) Statement I is correct but statement II is incorrect
- (2) Both statement I and statement II are correct
- (3) Both statement I and statement II are incorrect
- (4) Statement I is incorrect but statement II is correct

76. Correct order of S_N2 among the given compounds is:



- (1) (a) > (b) > (c) > (d)
- (2) (a) > (d) > (b) > (c)
- (3) (b) > (c) > (d) > (a)
- (4) (a) > (d) > (c) > (b)

77. Consider the following statements

(a) Greater is the stability of carbocation, more will be the rate of S_N1 reaction.

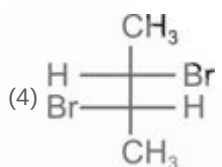
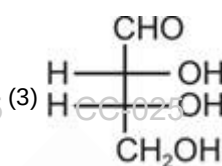
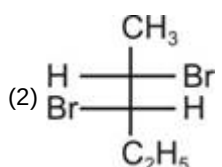
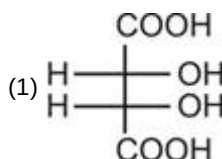
(b) S_N1 reactions are generally carried out in polar protic solvents.

(c) For a given alkyl group (R), the reactivity of halide follows $\text{R}-\text{I} > \text{R}-\text{Br} > \text{R}-\text{Cl}$

The correct statements are:

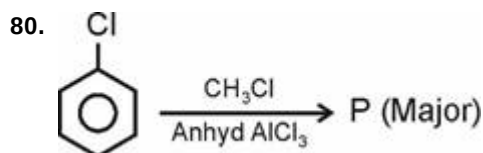
- (1) (a) and (b) only
- (2) (b) and (c) only
- (3) (a) and (c) only
- (4) (a), (b) and (c)

78. Which among the following is a meso compound?

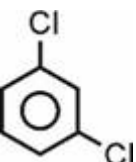
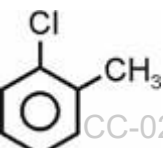
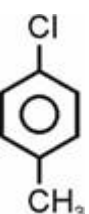
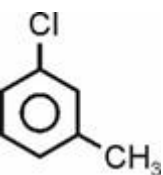


79. Which of the following is not a chiral molecule?

- (1) 2-Bromobutane
- (2) 2-Hydroxybutanoic acid
- (3) sec-Butyl alcohol
- (4) isobutyl alcohol



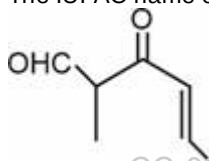
Product P in the above reaction is

- (1) 
- (2) 
- (3) 
- (4) 

81. The correct order of decreasing priority of given functional groups in IUPAC nomenclature is

- (1) $-\text{COCl} > -\text{CONH}_2 > -\text{COOR} > -\text{CN}$
 (2) $-\text{COOR} > -\text{CONH}_2 > -\text{COCl} > -\text{CN}$
 (3) $-\text{COOR} > -\text{COCl} > -\text{CONH}_2 > -\text{CN}$
 (4) $-\text{CN} > -\text{COCl} > -\text{COOR} > -\text{CONH}_2$

82. The IUPAC name of compound is



- (1) 3-keto-2-methylhex-4-enal
 (2) 5-formylhex-2-en-3-one
 (3) 5-methyl-4-oxohex-2-en-5-al
 (4) 3-keto-2-methylhex-5-enal

83. Consider the following statements about resonance
 (i) Resonating structures are hypothetical and do not represent real molecule.
 (ii) The energy of actual structure of the molecule (resonance hybrid) is lower than that of any canonical structures.
 (iii) The resonance structures have the same position of nuclei and the same number of unpaired electrons.
 The correct statement(s) is/are

- (1) (i) and (ii) only
 (2) (iii) only
 (3) (i) and (iii) only
 (4) (i), (ii) and (iii)

84. Heterocyclic compound among the following is

- (1) Cyclopropane
 (2) Aniline
 (3) Cyclohexene
 (4) Tetrahydrofuran

85. Kjeldahl method for estimation of nitrogen can be used to estimate the amount of nitrogen in which of the compound.

- (1) Aniline
 (2) Azobenzene
 (3) Pyridine
 (4) Nitrobenzene

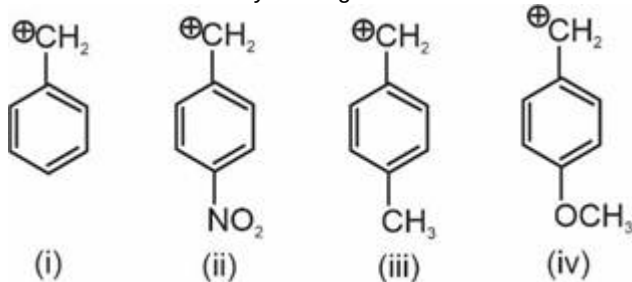
86. In Carius method, 0.18 g of an organic compound gave 0.09 g of AgBr. The percentage of Br in the compound is

- (1) 21.27%
 (2) 39%
 (3) 26%
 (4) 35%

87. Colour of $[\text{Fe}(\text{SCN})]^{2+}$, PbS and $[\text{Fe}(\text{CN})_5\text{NOS}]^{4-}$ respectively are

- (1) Blood red, black and violet
 (2) Prussian blue, orange and violet
 (3) Blood red, yellow and prussian blue
 (4) Yellow, black and violet

88. Correct order of stability of the given carbocations is



- (1) (i) > (iv) > (iii) > (ii)
- (2) (iii) > (iv) > (i) > (ii)
- (3) (ii) > (i) > (iii) > (iv)
- (4) (iv) > (iii) > (i) > (ii)

89. Given below are two statements

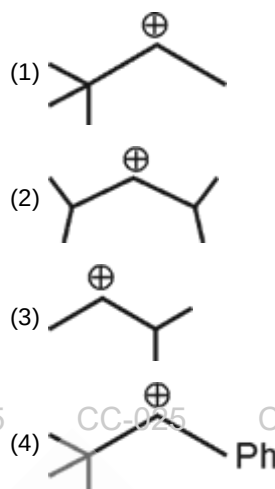
Statement-I : Paper chromatography is a type of partition chromatography.

Statement-II : Thin layer chromatography (TLC) is a type of adsorption chromatography.

In the light of the above statements, choose the correct answer from the options given below.

- (1) Statement I is incorrect but statement II is correct
- (2) Both statement I and statement II are correct
- (3) Both statement I and statement II are incorrect
- (4) Statement I is correct but statement II is incorrect

90. In which of the following species, hyper-conjugation does not take place?



91. If both strands of DNA act as template molecule during transcription then

- (1) Identical proteins are formed
- (2) The two strands of RNA produced simultaneously would form dsRNA
- (3) Gene expression would be normal
- (4) RNA cannot be formed

92. Biochemical nature of 'Transforming Principle' was identified by

- (1) Oswald Avery, Colin MacLeod and Maclyn McCarty
- (2) Watson and Crick
- (3) H. Temin and D. Baltimore
- (4) Marshall Nirenberg

93. If the sequence of template strand of DNA is 3' A T G C A T C G 5', find the sequence of mRNA strand.

- (1) 5' U A C G U A G C 3'
- (2) 5' T A C G U A A G 3'
- (3) 3' U A C G U A G C 5'
- (4) 3' A U C G G C A U 5'

94. An *E. coli* having heavy DNA is transferred from N^{15} to N^{14} medium and is allowed to multiply in N^{14} medium for 2 generations (40 min). What will be the fraction of hybrid DNA from the DNA extracted from the *E. coli* culture?

- (1) 25%
- (2) 50%
- (3) 75%
- (4) 12.5%

95. In Griffith's experiments, mice died when injected with

- (1) Heat killed R-strain bacteria
- (2) Live R-strain bacteria
- (3) Heat killed S-strain combined with live R strain bacteria
- (4) Heat killed S-strain bacteria

96. Select the **incorrect** statement w.r.t. features of human genome project.

- (1) The functions are unknown for over 50 percent of the discovered genes
- (2) Chromosome 1 has fewest genes while the Y has most genes
- (3) Less than 2 percent of genome codes for proteins
- (4) The average gene consists of 3000 bases, but sizes vary greatly, with largest known human gene being dystrophin at 2.4 million bases

97. In *lac* operon, *lac i* codes for

- (1) Beta-galactosidase
- (2) Permease
- (3) RNA polymerase
- (4) Repressor protein

98. Severo ochoa enzyme is

- (1) Polypeptide phosphorylase
- (2) RNA dependent DNA polymerase
- (3) Polynucleotide phosphorylase
- (4) DNA dependent RNA polymerase

99. Read the given statements and choose the **correct** option.

Statement A : The untranslated regions on mRNA are required for efficient translation process.

Statement B : Splicing is the process of removal of introns and joining of exons in a defined order.

- (1) Only statement A is correct
- (2) Both statement A and statement B are incorrect
- (3) Only statement B is correct
- (4) Both statement A and statement B are correct

100. During DNA replication SSB proteins

- (1) Join the discontinuously synthesised fragments of DNA
- (2) Bind to single-stranded DNA
- (3) Form RNA primer at 3' end
- (4) Bind to double stranded RNA

101. Choose the **correct** sequence of steps used in DNA fingerprinting.

- a. Blotting
- b. Digestion of DNA
- c. Hybridisation
- d. Electrophoresis
- e. Isolation of DNA
- f. Autoradiography

- (1) e → a → d → b → c → f
- (2) e → b → d → a → c → f
- (3) e → d → a → b → f → c
- (4) a → e → c → d → b → f

102. In a double stranded DNA, thymine is 35% of the total nitrogenous bases, then what will be percentage of cytosine?

- (1) 35%
- (2) 15%
- (3) 45%
- (4) 20%

103. What would happen if a mutation occurs in 25th codon (i.e. - UAC to UAG) of a gene encoding a polypeptide chain of 50 amino acids?

- (1) A polypeptide of 24 amino acids will be formed
- (2) A polypeptide of 50 amino acids will be formed
- (3) Two polypeptides of 24 and 26 amino acids will be formed
- (4) A polypeptide of 49 amino acids will be formed

104. Identify A, B, C and D w.r.t. central dogma of molecular biology.



Proposed by D

	A	B	C	D
(1)	Transcription	Translation	Replication	E. Chargaff
(2)	Replication	Translation	Transcription	M. Wilkins
(3)	Replication	Transcription	Translation	J. Watson
(4)	Replication	Transcription	Translation	F. Crick

- (1) (1)
- (2) (2)
- (3) (3)
- (4) (4)

105.How many nucleosomes are present in the nucleus of diploid eukaryotic cell which possess 6.6×10^6 bp?

- (1) 6.6×10^6
- (2) 6.6×10^4
- (3) 3.3×10^4
- (4) 3.3×10^6

106.The adaptor molecule that participates in the process of translation is transcribed by

- (1) RNA polymerase I
- (2) RNA polymerase II
- (3) RNA polymerase III
- (4) RNA primase

107.How many bp of DNA are wrapped around one histone octamer to form a nucleosome?

- (1) 100 bp
- (2) 30 bp
- (3) 200 bp
- (4) 50 bp

108.Taylor and colleagues proved semiconservative mode of replication in *Vicia faba* using

- (1) N^{15} labelled DNA
- (2) Radioactive labelled thymidine
- (3) P^{32} labelled DNA
- (4) S^{35} labelled DNA

109.Consider the following Assertion (A) and Reason (R) and choose the **correct** option.

Assertion (A): The *i* gene of *lac* operon is a nonconstitutive gene.

Reason (R): The *i* gene is switched on or off according to the requirement of a cell.

- (1) Both Assertion & Reason are true and the reason is the correct explanation of the assertion
- (2) Both Assertion & Reason are true but the reason is not the correct explanation of the assertion
- (3) Assertion is true statement but Reason is false
- (4) Both Assertion and Reason are false statements

110.Genetic code is degenerate, which means

- (1) One codon codes for only one amino acid
- (2) Codon is read on mRNA in a contiguous fashion
- (3) Three codons do not code for any amino acid
- (4) Some amino acids are coded by more than one codon

111.Which of the given codon has dual functions?

- (1) AUG
- (2) UAA
- (3) GUA
- (4) UAG

112.Opening of DNA helix during transcription is performed by

- (1) Helicase
- (2) RNA polymerase
- (3) Ligase
- (4) Topoisomerase

113.Histone octamer is formed by how many types of histone proteins?

- (1) Four
- (2) Two
- (3) Eight
- (4) Five

114.Heterochromatin can be differentiated from euchromatin, as the former

- (1) Is lightly stained region
- (2) Is loosely packed chromatin
- (3) Can form mRNA
- (4) Is transcriptionally inactive

115.Match the following columns and select the **correct** option.

Column-I	Column-II
a. Promoter region	(i) Codes for repressor protein in <i>lac</i> operon
b. VNTR	(ii) Site for RNA polymerase attachment
c. Regulator gene	(iii) The basis of DNA finger printing
d. ESTs	(iv) Identifying all genes that are expressed as RNA

- (1) a(i), b(iv), c(ii), d(iii)
- (2) a(i), b(iii), c(ii), d(iv)
- (3) a(ii), b(iii), c(i), d(iv)
- (4) a(ii), b(iv), c(i), d(iii)

116.Backbone of a polynucleotide chain in DNA is formed by

- (1) Sugar and phosphates
- (2) Only sugar
- (3) Nitrogenous base and sugar
- (4) Nitrogenous base and phosphates

117. Okazaki fragments are joined by the enzyme called DNA

- (1) Topoisomerase
- (2) Ligase
- (3) Polymerase
- (4) Gyrase

118. Unequivocal proof that DNA is the genetic material came from the experiments of

- (1) Francis Crick
- (2) Alfred Hershey and Martha Chase
- (3) Oswald Avery
- (4) Colin MacLeod

119. Phosphoester bond is absent in all, except

- (1) Uridine
- (2) Deoxycytidine
- (3) Adenosine monophosphate
- (4) Guanosine

120. The pitch of the DNA helix is

- (1) 2.2 nm
- (2) 3.4 nm
- (3) 5.2 nm
- (4) 6.1 nm

121. Aminoacylation of transfer RNA

- (1) Does not require energy
- (2) Helps in binding of mRNA to ribosome
- (3) Is first phase of translation
- (4) Is required for transcription

122. The tRNA with anticodon 3' UUC 5', will read which of the following codons?

- (1) 3' AAG 5'
- (2) 5' AAG 3'
- (3) 5' CAA 3'
- (4) 3' GGA 5'

123. Which one is **not** true regarding VNTR?

- (1) It shows very high degree of polymorphism
- (2) It is known as minisatellite
- (3) Its size varies from 0.1 to 20 bp
- (4) It has repetitive sequences

124. Select the **incorrect** statement w.r.t. polymorphism.

- (1) Polymorphism arises due to mutations
- (2) Polymorphism in DNA sequence is the basis of DNA fingerprinting
- (3) Polymorphism represents variation at genetic level
- (4) Polymorphism do not play any role in evolution and speciation

125. The 5.8S rRNA is transcribed by

- (1) RNA polymerase I
- (2) RNA polymerase II
- (3) DNA polymerase
- (4) RNA polymerase III

126. In oocytes of some vertebrates, which stage can last for months or years?

- (1) Diplotene
- (2) Pachytene
- (3) Zygotene
- (4) Diakinesis

127. Read the following statements and select the **correct** option.

Statement (A): The M Phase represents the phase when the actual cell division or mitosis occurs.
Statement (B): The M Phase starts with the nuclear division and usually ends with division of cytoplasm

- (1) Both the statements are correct
- (2) Both the statements are incorrect
- (3) Only statement A is correct
- (4) Only statement B is correct

128. Metaphase II differs from metaphase I as former

- (1) Involves separation of two homologous chromosomes
- (2) Has one metaphasic plate only
- (3) Occurs in diploid cells only
- (4) Occurs in somatic cells

129. What will be the number of chromosomes in S phase if the number of chromosomes in G₁ phase is 46?

- (1) 23
- (2) 92
- (3) 12
- (4) 46

130. During synthesis phase of cell cycle

- (1) Number of chromosomes become double
- (2) DNA replication takes place
- (3) The amount of DNA remains the same as in G₁ phase
- (4) Only duplication of organelles takes place

131.At which stage, morphology of chromosomes is most easily studied?

- (1) Prophase
- (2) Interphase
- (3) Metaphase
- (4) Telophase

132.Which of the following is true for quiescent phase?

- (1) Cell is metabolically active
- (2) Cytoplasmic growth occurs for cell division
- (3) Cell replicates its DNA
- (4) Nuclear division takes place

133.Prophase is marked by the

- (1) Initiation of condensation of chromosomal material
- (2) Duplication of centrosome
- (3) Duplication of cell organelles
- (4) Development of nuclear envelope

134.Match the following columns and select **correct** option.

	Column-I		Column-II
a.	Metaphase	(i)	Formation of synaptonemal complex
b.	Zygotene	(ii)	Chromosomes align at the equator
c.	Anaphase I	(iii)	Occurrence of recombination mediated process
d.	Pachytene	(iv)	Separation of homologous chromosomes from each other

(1) a(i), b(iii), c(ii), d(iv)

(2) a(ii), b(iii), c(iv), d(i)

(3) a(ii), b(i), c(iii), d(iv)

(4) a(ii), b(i), c(iv), d(iii)

135.A tetrad

- (a) Is a pair of two homologous chromosomes
- (b) Is clearly visible in zygotene stage
- (c) Consists of four chromatids

The **correct** one(s) is/are

(1) (a) only

(2) (a) and (c) only

(3) (b) only

(4) (a) and (b) only

136.The two key concepts of Darwinian theory of evolution are

- (1) Natural selection and branching descent
- (2) Natural selection and mutation
- (3) Mutation and branching descent
- (4) Embryology and mutation

137.Consider the statements given below and choose the correct option.

Statement A : Life appeared 500 million years after the formation of Earth.

Statement B : S.L. Miller observed the formation of amino acid while performing the simulated experiment based on the conditions of primitive Earth.

- (1) Both statements A and B are correct
- (2) Both statements A and B are incorrect
- (3) Only statement A is incorrect
- (4) Only statement B is incorrect

138.Cave paintings by pre-historic humans can be seen at Bhimbetka rock shelter in Raisen district of

- (1) Uttar Pradesh
- (2) Madhya Pradesh
- (3) Rajasthan
- (4) Assam

139.Darwin's finches on Galapagos Islands have evolved from common ancestral

- (1) Insect eating birds of same Island
- (2) Seed eating birds of South America
- (3) Flesh eating birds of same Island
- (4) Flesh eating birds of South America

ZOOLOGY

140. Read the following statements (A) and (B) and choose the correct option.

Statement A: The skull of baby chimpanzee is more like adult human skull than adult chimpanzee skull.

Statement B: *Ramapithecus* was more man-like and *Dryopithecus* was more ape-like.

- (1) Both statements A and B are correct
- (2) Both statements A and B are incorrect
- (3) Only statement A is correct
- (4) Only statement B is correct

141. Fossils form _____ of evolution.

Select the **correct** option to fill in the blank

- (1) Anatomical evidence
- (2) Geographical evidence
- (3) Palaeontological evidence
- (4) Embryological evidence

142. During the course of evolution, the first mammals on earth were like

- (1) Horse
- (2) Elephant
- (3) Shrews
- (4) Dinosaurs

143. Consider the following w.r.t. industrial melanism.

- (a) Represents directional natural selection
 - (b) Represents evolution due to anthropogenic actions
 - (c) Shows that in a mixed population with different varieties, those that can adapt better will contribute more in the gene pool
 - (d) One of the variants got completely wiped out
- How many of them is/are correct?

- (1) One
- (2) Two
- (3) Three
- (4) Four

144. S.L. Miller created an electric discharge in a closed flask which contained

- (1) CH₄, O₂, NH₃ at 800°C
- (2) H₂, NH₃ and water vapour at 400°C
- (3) CH₄, H₂, NH₃, water vapour at 800°C
- (4) CO₂, H₂O, O₂ at 800°F

145. Sweet potato (root modification) and potato (stem modification) are

- (1) Homologous structures that have evolved due to convergent evolution
- (2) Homologous structures that have evolved due to divergent evolution
- (3) Analogous structures that have evolved due to convergent evolution
- (4) Analogous structures that have evolved due to divergent evolution

146. Select the **incorrect** match.

- (1) Alfred Wallace – Worked in Malay Archipelago
- (2) Louis Pasteur – Supported the theory of biogenesis
- (3) Karl Ernst Von Baer – Approved the proposal of Ernst Haeckel
- (4) Hugo deVries – Proposed the mutation theory

147. Choose the **odd** one w.r.t. the gases present in primitive atmosphere on Earth.

- (1) O₂
- (2) CH₄
- (3) NH₃
- (4) H₂

148. In the section of a forest, there are more medium sized plants than tall plants and dwarf plants. Over a period of time, it was observed that the number of dwarf and tall plants is twice as that of medium sized plants. It is an example of

- (1) Disruptive selection
- (2) Directional selection
- (3) Stabilising selection
- (4) Balanced selection

149. An animal which is believed to have evolved into the first amphibian is

- (1) Pelycosaur
- (2) Therapsid
- (3) Tuatara
- (4) Coelacanth

150. Around 200 mya, some of land reptiles went back into the water and evolved into fish like

- (1) Reptiles
- (2) Amphibians
- (3) Birds
- (4) Mammals

151.When more than one adaptive radiations appear to have occurred in an isolated geographical area (representing different habitats), it is

- (1) Restricted distribution
- (2) Divergent evolution
- (3) Convergent evolution
- (4) Discontinuous distribution

152.Select the **incorrect** statement w.r.t. evolution.

- (1) The UV rays from the sun broke up water into hydrogen and oxygen.
- (2) The first organisms that possibly invaded land were plants.
- (3) It has been presumed that around 200 mya *Ichthyosaurs* evolved from amphibians.
- (4) About 65 mya, the dinosaurs suddenly disappeared from Earth.

153.Hugo deVries believed that it is mutation which causes evolution. He carried out his study on

- (1) Evening primrose
- (2) Pea plant
- (3) Wheat plant
- (4) Daffodils

154.Choose the **correct** chronological sequence w.r.t. human evolution.

- (1) *Ramapithecus* → *Australopithecus* → *Homo habilis* → *Homo erectus* → *Homo sapiens*
- (2) *Australopithecus* → *Ramapithecus* → *Homo habilis* → *Homo erectus* → *Homo sapiens*
- (3) *Homo habilis* → *Ramapithecus* → *Australopithecus* → *Homo erectus* → *Homo sapiens*
- (4) *Homo habilis* → *Dryopithecus* → *Australopithecus* → *Homo erectus* → *Homo sapiens*.

155.Select the **incorrect** option w.r.t. *Dryopithecus*.

- (1) They were more ape-like
- (2) They were hairy
- (3) Walked up right
- (4) Existed 15 mya

156.How many of the plant forms mentioned in the box below did not originate from Psilophyton?

Zosterophyllum, Ginkgos, Conifers, Bryophytes, Ferns, Gnetales, Sphenopsids, Arborescent lycopods

Select the **correct** option.

- (1) Three
- (2) Five
- (3) Four
- (4) Two

157.Forelimbs of all mammals including humans, cheetah, whales and bats, show same arrangement of bones from shoulder to the tips of the digits but perform different functions. This does not represents

- (1) Analogy
- (2) Common ancestry
- (3) Homology
- (4) Divergent evolution

158.Adaptive radiation refers to

- (1) Migration of members of a species to different geographical areas
- (2) Evolution of different species from an ancestral species in a given geographical area
- (3) Adaptations due to geographical isolation
- (4) Ability of adaptation in an individual in different environments

159.Assertion (A): Similarities in proteins and genes performing a given function among diverse organisms suggest homology.

Reason (R): These biochemical similarities point to the uncommon ancestry unlike structural similarities among diverse organisms.

In the light of above statements, select the **correct** option.

- (1) (A) and (R) are false
- (2) (A) and (R) are true and (R) is the correct explanation of the (A)
- (3) (A) is true but (R) is false
- (4) (A) and (R) are true but (R) is not the correct explanation of the (A)

160.*Ramapithecus* was existing about

- (1) 15 mya
- (2) 20 mya
- (3) 25 mya
- (4) 30 mya

161.Cenozoic era includes which of the following periods?

- (1) Jurassic and Triassic
- (2) Tertiary and Quaternary
- (3) Carboniferous and Devonian
- (4) Permian and Cretaceous

162.If gene migration happens multiple times, it is called

- (1) Genetic drift
- (2) Mutation
- (3) Gene flow
- (4) Genetic recombination

163. Select the odd one w.r.t. Australian marsupials.

- (1) Numbat
- (2) Tasmanian wolf
- (3) Spotted cuscus
- (4) Flying squirrel

164. At a particular locus, frequency of 'A' allele is 0.6 and that of 'a' is 0.4. What would be the frequency of heterozygotes in a randomly mating population at Hardy-Weinberg equilibrium?

- (1) 0.16
- (2) 0.36
- (3) 0.48
- (4) 0.24

165. According to Darwin, fitness word refers primarily to

- (1) Reproductive fitness
- (2) Physical fitness
- (3) Physiological fitness
- (4) Social fitness

166. Eye of the octopus and of mammals are

- (1) Homologous organs
- (2) Analogous organs
- (3) Indicative of common ancestry
- (4) Anatomically identical

167. *Homo sapiens* arose during

- (1) Ice age
- (2) Origin of dinosaurs
- (3) Extinction of dinosaurs
- (4) Extinction of thecodonts

168. According to Darwin, variations are _____ and _____. Select the correct option to fill the blanks respectively.

- (1) Random and directional
- (2) Small and directional
- (3) Small and directionless
- (4) Random and directionless

169. Consider the following statements.

- (a) All existing life forms share similarities to varying degrees and may also share common ancestor.
 - (b) Geological history of earth closely correlates with the biological history of earth.
 - (c) *Tyrannosaurus* was the largest herbivore dinosaur.
 - (d) Evolution of DDT resistant mosquitoes is an example of evolution by anthropogenic action.
- How many of the above statements is/are **correct**?

- (1) One
- (2) Two
- (3) Three
- (4) Four

170. In plants, the thorn and tendrils of *Bougainvillea* and *Cucurbita* respectively, reflect/represent

- (1) Homology
- (2) Analogy
- (3) Convergent evolution
- (4) Functional similarity

171. Each myofibril contains many serially arranged contractile units called

- (1) Muscle fibre
- (2) Sarcomere
- (3) Myofilament
- (4) Muscle bundle

172. In human kidney, the proximal convoluted tubule is lined by

- (1) Simple squamous epithelium
- (2) Simple columnar epithelium
- (3) Simple cuboidal brush border epithelium
- (4) Simple columnar brush border epithelium

173. Correct order of increasing toxicity among nitrogenous wastes ammonia, urea and uric acid is

- (1) Uric acid < urea < ammonia
- (2) Uric acid < ammonia < urea
- (3) Ammonia < urea < uric acid
- (4) Urea < uric acid < ammonia

174. Which of the following is **not** true regarding smooth muscle fibres?

- (1) They taper at both ends
- (2) Show faint striations
- (3) Found in walls of blood vessels
- (4) Cell junctions hold them together

175. In humans, cartilaginous joints are present at all of the following locations, **except**

- (1) In between the adjacent vertebrae
- (2) In between thoracic rib and sternum
- (3) In pubic symphysis
- (4) In between 12th pair of ribs and sternum

176. White muscle fibres differ from red muscle fibres as former

- (1) Possess plenty of mitochondria
- (2) Perform aerobic respiration only
- (3) Have high amount of sarcoplasmic reticulum
- (4) Contain high amount of red coloured oxygen storing pigment

177. Select the correct set of animals which are uricotelic in nature

- (1) Bony fishes and aquatic amphibians
- (2) Terrestrial amphibians and land reptiles
- (3) Land snails and birds
- (4) Bony fishes and reptiles

178. Read the features listed below.

- (a) Excitability (b) Contractility
(c) Extensibility (d) Elasticity

How many of them are exhibited by muscle fibres present in biceps?

- (1) (a), (b), (c) only
- (2) (a), (b), (d) only
- (3) (a), (b), (c), (d)
- (4) (b), (c), (d) only

179. Choose the **correct** pair of substances responsible for maintaining the osmolarity gradient in the medullary interstitium of kidney.

- (1) NaCl and HCl
- (2) NaCl and urea
- (3) Urea and KCl
- (4) KCl and NaCl

180. Select the correct match w.r.t. organisms and their excretory structures.

(1)	<i>Fasciola</i>	Flame cells
(2)	<i>Ascidia</i>	Green glands
(3)	<i>Amphioxus</i>	Antennal glands
(4)	Prawn	Malpighian tubules

- (1) (1)
- (2) (2)
- (3) (3)
- (4) (4)