

MP Murlidhar Mohol & APMA initiative

Mission NEET 2025

TIME : 3 HRS.

PAPER - I

MARKS: 720

DATE : 15.04.2025

PCB : ENTIRE XI + XII NCERT

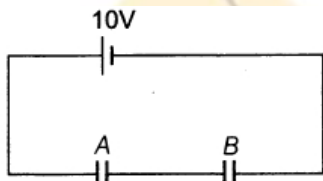
Note:

- * Every correct answer (+4 Mark)
- * Every wrong answer (-1 Mark)
- * Not attempted question (0 Mark)

1. A current of 2 A flows through $2\ \Omega$ resistor, when connected across a battery. The same battery supplies a current of 0.5 A when connected across a $9\ \Omega$ resistor. The internal resistance of the battery is

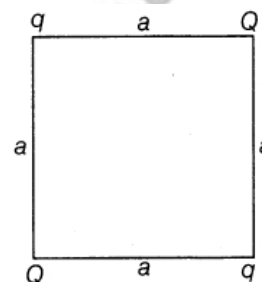
- 1) $0.5\ \Omega$ 2) $1\ \Omega$
 3) $(1/3)\ \Omega$ 4) $(1/4)\ \Omega$

2. In the circuit below, capacitors A and B have identical geometry but a material of dielectric constant 3 is present between the plate of B. The potential differences across A and B are, respectively



- 1) 2.5V, 0.5V 2) 8V, 2V
 3) 2V, 8V 4) 7.5V, 2.5V

3. A charge Q is fixed at each of two opposite corners of square. A charge q is placed at each of the other corners. If the resultant electric force on Q is zero, then Q and q are related as



- 1) $Q = -2\sqrt{2}q$ 2) $Q = 2\sqrt{2}q$
 3) $Q = \sqrt{2}q$ 4) $Q = -\sqrt{2}q$

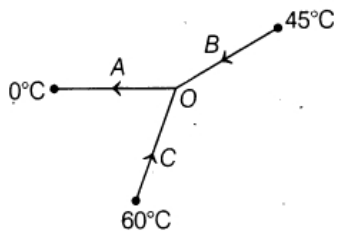
4. An electron is orbiting in 4th orbit of H-atom. If radius of first orbit is r , then de-Broglie wavelength associated with electron is

- 1) πr 2) $2\pi r$
 3) $8\pi r$ 4) $\frac{\pi \epsilon}{2}$

5. When a weight of 1 kg is suspended from a weightless spring, its length increases by 2 cm. The weight is pulled down by 10 cm and released, then the period of oscillation of spring and its maximum kinetic energy are (take $g = 10 \text{ ms}^{-2}$)

1) 2.5 s, 0.28 J 2) 0.5 s, 5 J
3) 0.28 s, 2.5 J 4) 5 s, 0.5 J

6. Three rods made of same material and having cross-section in ratio 1 : 2 : 3 are joined as shown in the figure. Each rod is of same length. The temperature at the junction of the three rods (in $^{\circ}\text{C}$) is



1) 45 2) 60
3) 80 4) 35

7. A free nucleus of mass 2 amu emits a gamma photon (when initially at rest) the wavelength of gamma photon is $0.01 \text{ \AA}$. Find recoil speed of the nucleus.

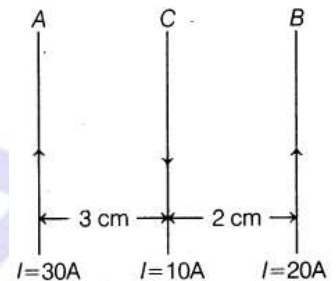
1) $2 \times 10^5 \text{ m/s}$ 2) $5 \times 10^4 \text{ m/s}$
3) $6 \times 10^4 \text{ m/s}$ 4) $1 \times 10^5 \text{ m/s}$

8. If the particles listed below all have the same kinetic energy, which one would possess the shortest de-Broglie wavelength?

1) Electron 2) Proton
3) Deuteron 4) α -particle

9. Three long, straight parallel wires carrying currents are placed in a plane as shown in the fig. The force acting on half metre length of wire C will be

1) $2.5 \times 10^{-4} \text{ N}$
2) $1.4 \times 10^{-5} \text{ N}$
3) $3.7 \times 10^{-3} \text{ N}$
4) zero



10. In series L-R circuit, the value of L is $\frac{\sqrt{3}}{\pi} \text{ H}$ and

frequency of applied AC source is 50 Hz. If the phase difference between applied emf and current is 60° , then the value of resistance R is

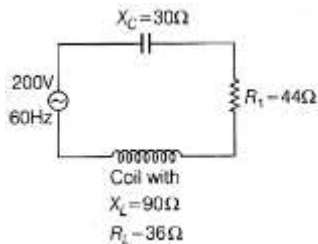
1) 100Ω 2) $100\sqrt{3} \Omega$
3) $\frac{100}{\sqrt{3}} \Omega$ 4) $50\sqrt{3} \Omega$

11. A body of mass m_1 moving with a velocity 3 ms^{-1} collides with another body at rest of mass m_2 . After collision, the velocities of the two bodies are 2 ms^{-1} and 5 ms^{-1} respectively, along the direction of motion of m_1 . The ratio of $\frac{m_1}{m_2}$ is

1) $\frac{5}{12}$ 2) 5
3) $\frac{1}{5}$ 4) $\frac{12}{5}$

12. Two polaroids are crossed. If now one of them is rotate through 30° and unpolarised light of intensity I_0 is incident on the first polaroid, then the intensity of transmitted light will be
- 1) $\frac{I_0}{4}$ 2) $\frac{3I_0}{4}$
3) $\frac{3I_0}{8}$ 4) $\frac{I_0}{8}$
13. A body of mass 50 kg is pulled by a rope of length 6 m on a smooth surface by a force 106 N applied at the other end. The linear density of the rope is 0.5 kg/m. The force acting on 50 kg mass is (assume rope and force remains horizontal)
- 1) 100 N 2) 200 N
3) 50 N 4) 150 N
14. The gravitational field due to a mass distribution is $I = k/r^3$ in the x-direction (k is a constant). The gravitational potential is taken to be zero at infinity, then its value at a distance x is
- 1) k/x 2) $k/2x$
3) k/x^2 4) $k/2x^2$
15. Radius of an air bubble at certain depth of Indian ocean is r and it becomes $18r$, when air bubble rises to the top surface of the ocean. If t cm of water be the atmospheric pressure, then the depth of the ocean is
- 1) 3835 t cm 2) 3400 t cm
3) 4852 t cm 4) 5831 t cm
16. The de-Broglie wavelength of neutron at 27°C is λ , what will be its wavelength at 927°C ?
- 1) $\frac{\lambda}{2}$ 2) $\frac{\lambda}{3}$
3) $\frac{\lambda}{9}$ 4) $\frac{\lambda}{4}$
17. An AC voltage source has an output of $\Delta V = (200\text{V}) \sin 2\pi ft$. The source is connected to a $100\ \Omega$ resistor. The rms current in the resistance is
- 1) 0.71 A 2) 2.41 A
3) 1.41 A 4) 3.41 A
18. If voltage across a bulb rated 220 V – 100 W drop by 2.5% of its rated value, the percentage of the rated value by which the power would decrease is
- 1) 2.5% 2) 10%
3) 20% 4) 5%
19. Statement I: The velocity of a particle at a point on its trajectory is equal to the slope at that point.
Statement II: The velocity of the particle acts along the tangent to the trajectory at the point.
- 1) Statement I is correct and Statement II is incorrect
2) Statement I is incorrect and Statement II is correct
3) Both Statement I and Statement II are correct
4) Both Statement I and Statement II are incorrect

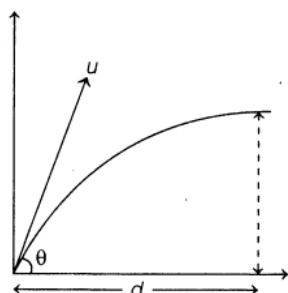
20. A series circuit consists of a capacitor of capacitive reactance $30\ \Omega$, a non-inductive resistor of $44\ \Omega$ and a coil of inductive reactance $90\ \Omega$ and a resistance of $36\ \Omega$ connected across 200 V , 60 Hz line as shown in the figure. Find the power dissipated in the coil.



- 1) 0 W 2) 176 W
 3) 144 W 4) 320 W
21. A square of side L metre lies in the XY -plane in a region, where the magnetic field is given by $B = B_0(2\hat{i} + 3\hat{j} + 4\hat{k})T$, where B_0 is constant. The magnitude of flux passing through the square is
- 1) $4B_0L^2\text{Wb}$ 2) $3B_0L^2\text{Wb}$
 3) $\sqrt{29}B_0L^2\text{Wb}$ 4) $2B_0L^2\text{Wb}$
22. The relation between an AC voltage source and time in SI unit is $V = 240 \sin(100\pi t) \cos(100\pi t)\text{ V}$, then the value of peak voltage and frequency will be
- 1) 120 V and 100 Hz 2) 120 V and 200 Hz
 3) 240 V and 100 Hz 4) $\frac{120}{\sqrt{2}}\text{ V}$ and 100 Hz

23. A bar magnet is cut into four equal parts such that each part has cross-sectional area and length equal to half of the original values the pole strength of each part is
- 1) half of the initial
 2) remains same
 3) one-fourth of the initial
 4) None of these
24. An electromagnetic wave is propagating in a medium with a velocity $v = -a\hat{j}$. Magnetic field oscillates in the direction of $+X$ -axis, then the direction of oscillating electric field of electromagnetic wave will be
- 1) along $-x$ -direction 2) along $+y$ -direction
 3) along $-z$ -direction 4) along $+z$ -direction
25. The magnetic field of an electromagnetic wave is given by $B_y = 3 \times 10^{-7} \sin(10^3x + 6.28 \times 10^{12}t)$. The wavelength of the electromagnetic wave is
- 1) 0.32 cm 2) 0.63 cm
 3) 6.28 cm 4) 3.14 cm
26. The copper wire is stretched to make it 0.5% longer. The percentage change in its electrical resistance
- 1) 2.0% 2) 1.0%
 3) 0.5% 4) 2.5%
27. A charge q is enclosed in a cube at its centre, then electric flux associated with two opposite faces of the cube is
- 1) $\frac{q}{6\epsilon_0}$ 2) zero
 3) $\frac{q}{3\epsilon_0}$ 4) $\frac{2q}{3\epsilon_0}$

28. If a stone is hit a point at a distance d away and height h above the point from where the stone starts as shown in the figure. The initial velocity of stone is



- 1) $\sqrt{\frac{gd^2}{d-h}}$
 - 2) $\frac{d}{\cos \theta} \sqrt{\frac{g}{2(d \tan \theta - h)}}$
 - 3) $\sqrt{\frac{gd^2}{h \cos^2 \theta}}$
 - 4) $\frac{g}{\cos \theta} \sqrt{\frac{d}{2(d \tan \theta - h)}}$
29. An isotropic material has coefficient of linear expansion α_1, α_2 and α_3 along X, Y and Z axes, respectively. If γ is coefficient of cubical expansion of its material, then
- 1) $3\gamma = \alpha_1 + 2\alpha_2 + \alpha_3$
 - 2) $\gamma = \alpha_1 + \alpha_2 + \alpha_3$
 - 3) $2\gamma = 2\alpha_1 + \alpha_2 + \alpha_3$
 - 4) $\gamma = \alpha_1 + \alpha_2 + \frac{\alpha_1^2}{\alpha_3}$

30. The frequency of a light wave in a material is 2×10^{14} Hz and wavelength is $5000 \text{ \AA}$. The refractive index of material will be
- 1) 1.40
 - 2) 1.50
 - 3) 3
 - 4) 1.33
31. A beam of light composed of red and green rays is incident obliquely at a point on the face of a rectangular glass slab. When coming out on the opposite parallel face, then the red and green rays emerge from
- 1) two points propagating in two different non-parallel directions.
 - 2) two points propagating in two different parallel directions
 - 3) one point propagating in two different directions
 - 4) one point propagating in the same direction
32. When a gas expands adiabatically,
- 1) no energy is required for expansion
 - 2) energy is required and it comes from the container wall
 - 3) internal energy of the gas is used in performing work
 - 4) law of conservation of energy is violated
33. A resonance air column shows resonance with a tuning fork of frequency 256 Hz at column lengths 32.5 cm and 112.9 cm. The end correction and speed of sound in air are
- 1) 4.1 cm, 77.7 ms^{-1}
 - 2) 7.7 cm, 411.65 ms^{-1}
 - 3) 5 cm, 224.5 ms^{-1}
 - 4) 6.7 cm, 352.7 ms^{-1}

34. The radius of gyration k of a solid sphere of mass M and radius R about a certain axis is equal to $\sqrt{2}R$. Find the distance of that axis from the centre of the sphere

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

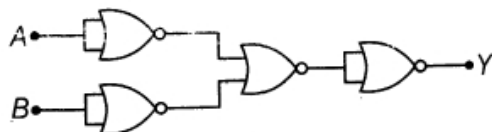
35. Given below are two statements

Statement I: If two unlike charges are brought nearer, then potential energy of system increases.

Statement II: If two charges q_1 and q_2 are separated by a distance r , then potential energy of the system is given by $U = \frac{1}{4\pi\epsilon_0} \frac{q_1 q_2}{r^2}$.

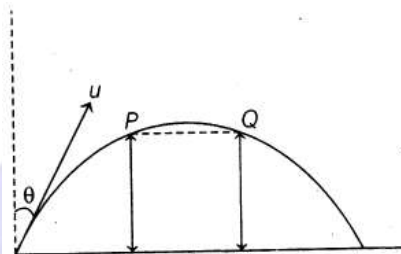
- 1) Both Statement I and Statement II are correct
 2) Both Statement I and Statement II are incorrect
 3) Statement I is correct but Statement II is incorrect
 4) Statement I is incorrect but Statement II is correct

36. The circuit as shown in the figure is equivalent to



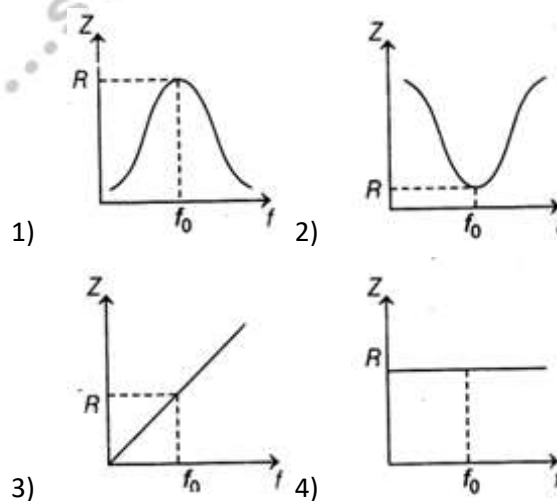
- 1) AND gate 2) NOR gate
 3) OR gate 4) NAND gate

37. A particle is thrown at an angle of θ with velocity u in vertical direction. It just crosses the top of two poles each of height h after 1s and 3s, respectively. The maximum height of the projectile is

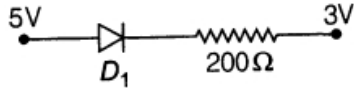


- 1) 39.2 m 2) 19.6 m
 3) 9.8 m 4) 4.9 m

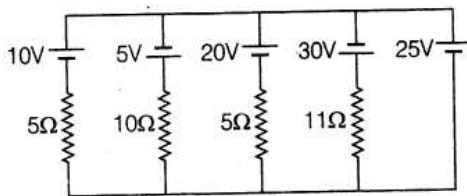
38. For an L-C-R series resonance circuit, which graph shows the correct relation between frequency (f) of AC source and impedance (Z)? [Here, $f_0 \rightarrow$ resonant frequency]



39. The value of current in the following diagram will be



- 1) 10 mA 2) 1 mA
3) 0.1 mA 4) zero
40. One mole of an ideal gas ($\gamma = 1.4$) is adiabatically compressed, so that its temperature rises from 27°C to 35°C . The change in the internal energy of the gas is ($R = 8.3 \text{ J/mole K}$)
- 1) 166 J 2) 168 J
3) -166 J 4) -168 J
41. In the circuit shown below, current flowing through 25 V cell is



- 1) 10 A 2) 7.2 A
3) 12 A 4) 14.2 A
42. In Young's double slit experiment, the fringe width is found to be 0.5 mm. If the whole apparatus is immersed in liquid of refractive index $\frac{5}{3}$, without disturbing the geometrical arrangement, then new fringe width will be
- 1) 0.35 mm 2) 0.6 mm
3) 0.45 mm 4) 0.3 mm

43. A monkey is descending from the branch of a tree with constant acceleration. If the breaking strength is 25% of the weight of the monkey, then the maximum acceleration with which monkey can slide down without breaking the branch is

- 1) g 2) $\frac{3g}{4}$
3) $\frac{g}{4}$ 4) $\frac{g}{2}$

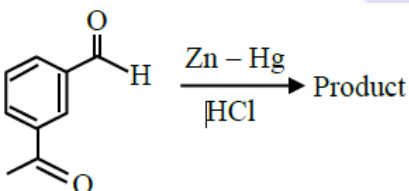
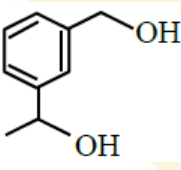
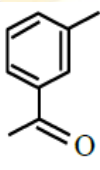
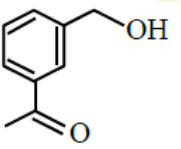
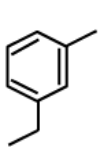
44. The dominant mechanism for motion of charge carriers in forward and reverse biased silicon p-n junction are

- 1) diffusion in forward biased, drift in reverse bias
2) drift in forward biased, drift in reverse biased
3) diffusion on both forward and reverse bias
4) drift in both forward and reverse bias

45. The centripetal acceleration of a satellite of mass 1000 kg orbiting at 1600 km above the earth's surface is

(Take, radius of earth = $6.4 \times 10^6 \text{ m}$ and $g = 9.8 \text{ ms}^{-2}$)

- 1) $\left(\frac{4}{5}\right)^2 g$ 2) $\frac{2}{5}g$
3) $\frac{4}{5}g$ 4) $\frac{4}{25}g$

46. The solubility product of a salt having general formula MX_2 in water is 32×10^{-15} .
The concentration of M^{2+} ions in the aqueous solution of the salt is
- $2 \times 10^{-5} \text{ M}$
 - $16 \times 10^{-15} \text{ M}$
 - $8 \times 10^{-15} \text{ M}$
 - $0.8 \times 10^{-6} \text{ M}$
47. Consider the following statements
Statement I: Isopentane and neopentane are structural isomers.
Statement II: One carbon atom in isopentane is tertiary.
In the light of above statements, choose the correct option:
- Both the statement I and statement II are correct
 - Both the statement I and statement II are incorrect
 - Statement I is correct but statement II is incorrect
 - Statement I is incorrect but statement II is Correct
48. Identify the product in the following reaction :
- 
- 1)  2) 
- 3)  4) 
49. For the first order reaction, the ratio of $t_{1/2}$ to $t_{1/3}$ for the amount of substance left will be
[Given, $\log 2 = 0.3010$; $\log 3 = 0.4771$].
- 0.520
 - 0.413
 - 0.328
 - 0.631
50. The type of hybridization and number of lone pair(s) of electrons of Xe in XeOF_4 , respectively, are :
- sp^3d^2 and 1
 - sp^3d and 2
 - sp^3d^2 and 2
 - sp^3d and 1
51. X g of ethylamine is subjected to reaction with NaNO_2/HCl followed by water; evolved dinitrogen gas which occupied 2.24 L volume at STP. X is $\text{_____} \times 10^{-1} \text{ g}$.
- 4.5
 - 0.1
 - 45
 - 25
52. Which among the following is most easily hydrolysed by aqueous KOH?
- $\text{C}_6\text{H}_5\text{CH}_2\text{Cl}$
 - $\text{C}_6\text{H}_5\text{CHClC}_6\text{H}_5$
 - $\text{CH}_3\text{CH}_2\text{Cl}$
 - $\text{CH}_3\text{CHClCH}_3$

53. Match List-I with List-II

List-I		List-II	
A.	Number of sub-shells in a shell	I.	$2(2l + 1)$
B.	Maximum number of electrons in a sub-shell	II.	$n - l - 1$
C.	Number of spherical nodes	III.	n
D.	Number of spectral lines in Lyman series for a gas (for n to 1 transition)	IV.	$(n - 1)$

Choose the correct answer from the options given below.

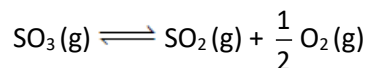
- 1) A-III, B-I, C-IV, D-II 2) A-III, B-I, C-II, D-IV
 3) A-I, B-II, C-III, D-IV 4) A-I, B-IV, C-II, D-III

54. Which of the following statements are correct?

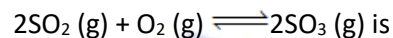
- (A) The electronic configuration of Cr is $[\text{Ar}] 3d^5 4s^1$.
 (B) The magnetic quantum number may have a negative value.
 (C) The number of radial nodes & total number of nodes in 4p orbital respectively are 2 and 3
 (D) According to quantum mechanical model of atom, " ψ " represents probability function

- 1) A, C and D only 2) A and B only
 3) A and C only 4) A, B and C only

55. The equilibrium constant for the reaction



is $K_c = 4.9 \times 10^{-2}$. The value of K_c for the reaction given below is



- 1) 4.9 2) 41.6
 3) 49 4) 416

56. $\text{CH}_3\text{CH}_2\text{CH} = \text{CH}_2 + \text{HBr} \xrightarrow{(\text{C}_6\text{H}_5\text{CO})_2\text{O}_2} \text{A}$
 (major)

The compound (A) in above reaction is

- 1) 1-Bromobutane
 2) 2-Bromobutane
 3) 1, 2-Dibromobutane
 4) 3-Bromobutane

57. Consider the following statements.

Statement I: The solution of Phenol and aniline, exhibits negative deviation from Raoult's law.

Statement II: The mixture of CHCl_3 and acetone boils at a temperature higher than expected.

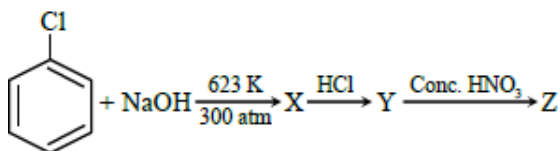
In the light of the above statements, choose the correct answer from the options given below:

- 1) Statement I is false but Statement II is true.
 2) Statement I is true but Statement II is false.
 3) Both Statement I and Statement II are true.
 4) Both Statement I and Statement II are false.

58. Select the option with correct property.

- 1) $[\text{Ni}(\text{CO})_4]$ and $[\text{NiCl}_4]^{2-}$ are diamagnetic
- 2) $[\text{Ni}(\text{CO})_4]$ and $[\text{NiCl}_4]^{2-}$ are paramagnetic
- 3) $[\text{NiCl}_4]^{2-}$ diamagnetic, $[\text{Ni}(\text{CO})_4]$ paramagnetic
- 4) $[\text{Ni}(\text{CO})_4]$ diamagnetic, $[\text{NiCl}_4]^{2-}$ paramagnetic

59. Identify compound (Z) in the following reaction sequence.



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

60. Volume of air required to completely burn 12g of carbon at STP would be (Air contains 21% oxygen by volume)

- 1) 106.67 L
- 2) 118.2 L
- 3) 120 L
- 4) 225.4 L

61. Match List - I (species) and List - II (bond orders) and select the correct answer :

List-I		List-II	
A.	N_2	I.	1.0
B.	O_2	II.	2.0
C.	F_2	III.	2.5
D.	O_2^+	IV.	3.0

- 1) A-(IV), B-(II), C-(I), D-(III)
- 2) A-(I), B-(III), C-(IV), D-(II)
- 3) A-(I), B-(II), C-(IV), D-(III)
- 4) A-(IV), B-(III), C-(I), D-(II)

62. The statements(s) that are correct about the species O^{2-} , F^- , Na^+ and Mg^{2+}

- A) All are isoelectronic
- B) All have the same nuclear charge
- C) O^{2-} has the largest ionic radius
- D) Mg^{2+} has the smallest ionic radius

Choose the most appropriate answer from the options given below

- 1) (B), (C) and (D) only
- 2) (A), (B) (C) and (D)
- 3) (C) and (D) only
- 4) (A), (C) and (D) only

63. For a cell involving one electron $E_{\text{cell}}^0 = 0.59 \text{ V}$ at 298K, the equilibrium constant for the cell reaction is [Given that, $\frac{2.303RT}{F} = 0.059 \text{ V}$ at

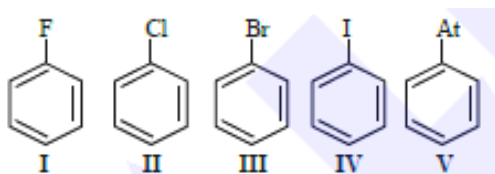
$T = 298 \text{ K}$]

- 1) 10^2
- 2) 10^5
- 3) 10^{10}
- 4) 10^{30}

64. Which of the following compounds show colour due to d - d transition ?

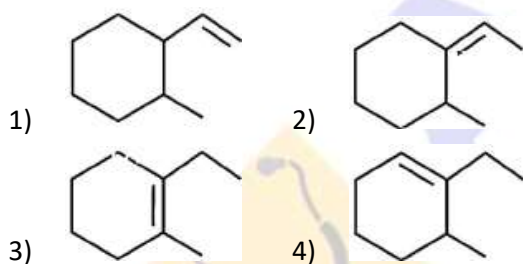
- 1) $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ 2) $\text{K}_2\text{Cr}_2\text{O}_7$
 3) K_2CrO_4 4) KMnO_4

65. The number of halobenzenes from the following that can be prepared by Sandmeyer's reaction is

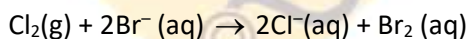


- 1) 3 2) 4
 3) 1 4) 2

66. Which of the following compounds liberates maximum amount of energy on hydrogenation reaction?



67. Consider the reaction,



The emf of the cell when $[\text{Cl}^-] = [\text{Br}_2] = [\text{Br}^-] = 0.01$

M and Cl_2 gas at 1 atm pressure will be E_{cell}^0 for the above reaction is = 0.29 volt.

- 1) 0.65 2) 0.35
 3) 0.85 4) 1.35

68. The I_1, I_2, I_3, I_4 values of an element 'M' are 120, 600, 1000, and 8000 KJ/mole respectively then the formula of its sulphate.

- 1) MSO_4 2) $\text{M}_2(\text{SO}_4)_3$
 3) M_2SO_4 4) $\text{M}_3(\text{SO}_4)_2$

69. Given below are two statements:

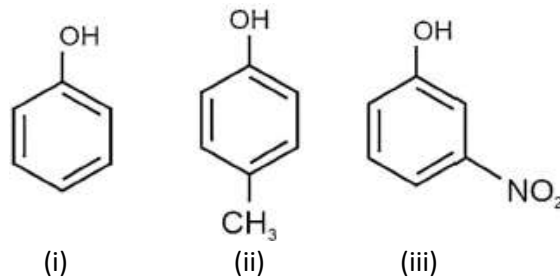
Statement I : On passing $\text{HCl}(\text{g})$ through a saturated solution of BaCl_2 at room temperature white turbidity appears.

Statement II : When HCl gas is passed through a saturated solution of NaCl , sodium chloride is precipitated due to common ion effect.

In the light of the above statements, choose the most appropriate answer from the options given below:

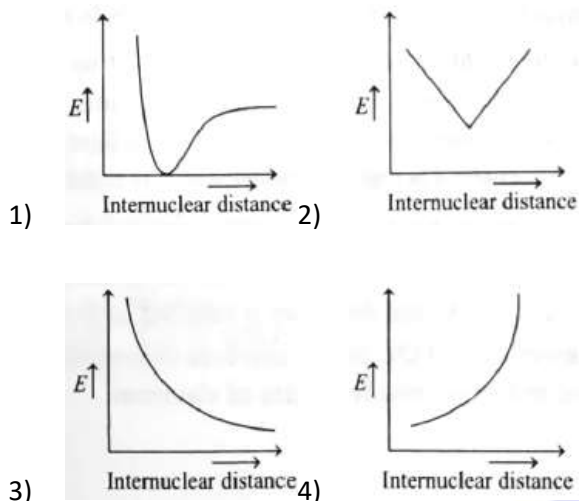
- 1) Statement I is correct but Statement II is incorrect
 2) Both Statement I and Statement II are incorrect
 3) Statement I is incorrect but Statement II is correct
 4) Both Statement I and Statement II are correct

70. Correct order of acidic strength of the given compounds is



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

71. Which plot best represents the potential energy (E) of two hydrogen atoms as they approach one another to form a hydrogen molecule?



72. **Statement-I** : Chlorine has less electron gain enthalpy than fluorine.

Statement-II: Helium has the highest first ionization enthalpy in the periodic table.

- 1) Statement I is true but Statement II is false
- 2) Both Statement I and Statement II are false
- 3) Both Statement I and Statement II are true.
- 4) Statement I is false but Statement II is true

73. The correct statements from the following are :
- (A) The decreasing order of atomic radii of group 13 elements is $Tl > In > Ga > Al > B$.
 - (B) Down the group 13 electronegativity decreases from top to bottom.
 - (C) Al dissolves in dil. HCl and liberates H_2 but conc. HNO_3 renders Al passive by forming a protective oxide layer on the surface.
 - (D) All elements of group 13 exhibit highly stable +1 oxidation state.
 - (E) Hybridisation of Al in $[Al(H_2O)_6]^{3+}$ ion is sp^3d^2 .

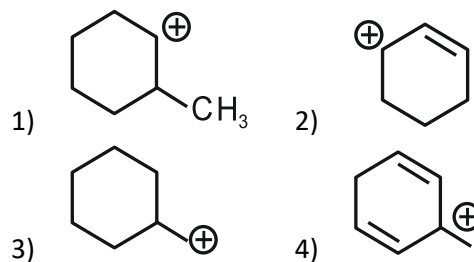
Choose the correct answer from the options given below :

- 1) (C) and (E) only
- 2) (A), (C) and (E) only
- 3) (A), (B), (C) and (E) only
- 4) (A) and (C) only

74. The half-life period of a first order chemical reaction is 6.93 minutes. The time required for the completion of 99% of chemical reaction will be ($\log 2 = 0.301$)

- | | |
|------------------|------------------|
| 1) 23.03 minutes | 2) 46.06 minutes |
| 3) 460.6 minutes | 4) 230.3 minutes |

75. Which of the following carbocations is most stable?



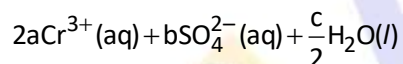
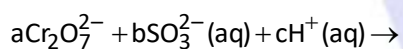
76. Match the List-I with List-II.

List-I		List-II	
A.	Hess law is not applicable for	I.	Not a state function
B.	All combustion reaction are	II.	Heat of dilution
C.	Work	III.	Exothermic
D.	Difference between two integral heats of solution	IV.	Nuclear reaction

Choose the correct answer from the options given below.

- 1) A-(i), B-(ii), C-(iii), D-(iv)
- 2) A-(iv), B-(iii), C-(i), D-(ii)
- 3) A-(ii), B-(i), C-(iii), D-(iv)
- 4) A-(i), B-(ii), C-(iv), D-(iii)

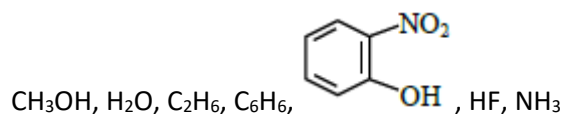
77. On balancing the given redox reaction,



The coefficients a, b and c are found to be, respectively.

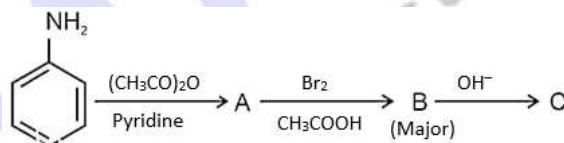
- 1) 3, 8, 1
- 2) 1, 8, 3
- 3) 8, 1, 3
- 4) 1, 3, 8

78. Number of molecules from the following which can not exhibit hydrogen bonding is _____.



- 1) 2
- 2) 3
- 3) 5
- 4) 6

79. Consider the following of reaction sequence



Compound A and C respectively are

- 1) Acetanilide and 2-Bromoaniline
- 2) N-Phenylethanamide and 4-Bromoaniline
- 3) N-Methylaniline and 2, 4-Dibromoaniline
- 4) N-Phenylethanamide and 3-Bromoaniline

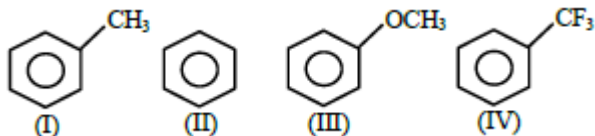
80. Find the value of ΔG^0 for the reaction having K_{eq} value 4×10^5 at 300 K temperature.

- 1) 7.73 cal
- 2) -32.18 kJ
- 3) 7.73 kcal
- 4) both 2 & 3

81. A reagent which gives brilliant red precipitate with Nickel ions in basic medium is

- 1) sodium nitroprusside
- 2) neutral FeCl₃
- 3) meta - dinitrobenzene
- 4) dimethyl glyoxime

82.



The correct arrangement for decreasing order of electrophilic substitution for above compounds

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

83. Given below are two statements

Statement (I): Benzaldehyde and acetone can be distinguished by Fehling's test.

Statement (II): Benzaldehyde and acetaldehyde can be distinguished by Tollens' reagent.

In the light of above statements choose the correct option:

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

84. The radius of hydrogen atom in the ground state is $0.53 \text{ \AA}$. The radius of Li^{2+} ion (atomic number = 3) in a similar state is

- 1) $0.17 \text{ \AA}$ 2) $0.265 \text{ \AA}$
- 3) $0.53 \text{ \AA}$ 4) $1.06 \text{ \AA}$

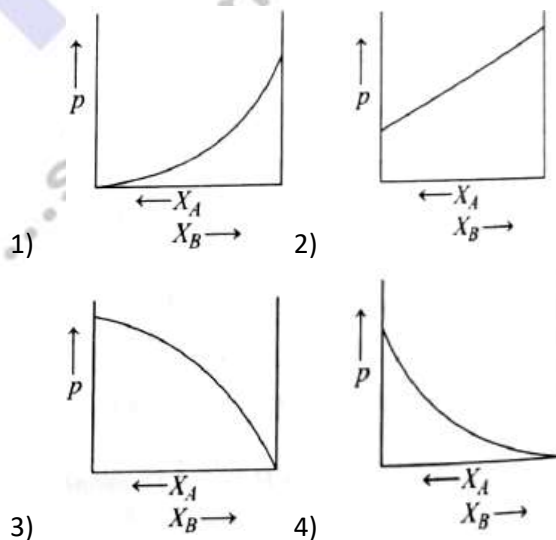
85. Crystal field stabilization energy for the complex, $\text{K}_3[\text{FeF}_6]$ is

- 1) Zero 2) $-2\Delta_0$
- 3) $-2.4\Delta_0$ 4) $-1.2\Delta_0$

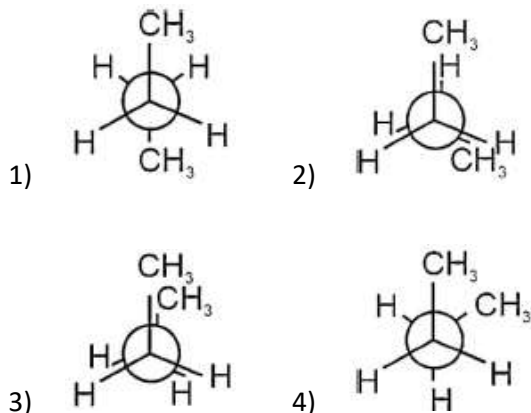
86. Which pair contains only globular proteins?

- 1) Keratin and myosin
- 2) Keratin and insulin
- 3) Myosin and albumin
- 4) Insulin and albumin

87. For a binary ideal liquid solution, the variation in total vapour pressure versus composition of the solution is given by which of the curves?



88. Most unstable conformation of n-butane is (consider $C_2 - C_3$ bond rotation)



89. 0.5 g of hydrocarbon gave 0.9 g water on combustion. The percentage of carbon in the hydrocarbon is

- 1) 20 2) 28.8
3) 80.0 4) 68.6

90. Given below are two statements.

Statement I: For a solution of $AlCl_3$ in water, the van't Hoff factor (i) is greater than 1.

Statement II: The solubility of gas is directly proportional to the pressure of gas over the solutions at a given temperature.

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

- 1) Statement I is false but Statement II is true.
2) Both Statement I and Statement II are true.
3) Both Statement I and Statement II are false.
4) Statement I is true but Statement II is false.

91. Which of the following kingdoms include organisms with body organization of cellular type only?

- 1) Monera, Protista
2) Protista only
3) Monera only
4) Monera, Protista, Fungi

92. Read the following statements regarding thermoacidophiles and select the correct option.

- (i) They are included in the group Archaeobacteria
(ii) They are responsible for the production of biogas from fossil fuels
(iii) They live in hot sulphur springs
(iv) They are obligate aerobes

- 1) Statement (i) and (iii) are correct
2) Statement (ii), (iii) and (iv) are correct
3) Statement (i), (ii) and (iv) are correct
4) (i) and (ii) only are correct

93. Read the following statements and find out the incorrect statement.

- 1) Algae usually reproduce vegetatively by fragmentation, asexually by formation of different types of spores and sexually by formation of gametes.
2) All bryophytes are homosporous
3) In fern sporophyte as well as gametophyte are independent
4) Gymnosperms may be homosporous or heterosporous.

94. Gemmae are multicellular green structures for vegetative propagation. These are found in gemma cups in
- 1) Sporophyte of Marchantia
 - 2) Gametophyte of Marchantia thallus
 - 3) Gametophyte of Funaria and Marchantia
 - 4) Fern prothallus
95. Which of the following flowers are zygomorphic?
- A. Ray floret of sunflower.
 - B. Disc floret of sunflower.
 - C. Maize
 - D. Mustard
- 1) A, B only 2) A, B, C only
 - 3) A, C only 4) A, C, D only
96. Fill in the blanks:
- a. In the ... 1..., the vascular bundles have no cambium present in them. Hence, since they do not form secondary tissue they are referred to as ...2...
 - b. In ...3... stems, cambium is present between phloem and xylem. Such vascular bundles because of the presence of cambium possess the ability to form secondary xylem and phloem tissues and hence called ...4... vascular bundles
- 1) 1-monocotyledons, 2-open, 3-dicotyledons, 4-closed
 - 2) 1-dicotyledons, 2-open, 3-monocotyledons, 4-closed
 - 3) 1-monocotyledons, 2-closed, 3-dicotyledons, 4-open
 - 4) 1-dicotyledons, 2-closed, 3-monocotyledons, 4-open
97. Corymbose raceme inflorescence is found in the members of the family.
- 1) Malvaceae 2) Leguminosae
 - 3) Cruciferae 4) Graminae
98. Lady finger belongs to family.
- 1) Malvaceae 2) Cucurbitaceae
 - 3) Liliaceae 4) Brassicaceae
99. A monocot root differs from dicot root in:
- (A) absence of casparian strips
 - (B) having more than six vascular bundles
 - (C) having large well developed pith
 - (D) not showing secondary growth
- 1) A, C, D only 2) B, C, D only
 - 3) C, D only 4) A, B, C, D
100. Which of the following is measured as fluidity of lipid bilayer of plasma membrane?
- 1) The ability of protein to move within the lipid bilayer
 - 2) The ability of plasma membrane to transport material in and out of cell
 - 3) The ability of proteins to be embedded within lipid bilayer
 - 4) The arrangement of hydrophobic tails and hydrophilic head of phospholipid molecules within lipid bi layer.

101. Select the incorrect statement.

- 1) Leucoplasts are colourless plastids of varied shapes and sizes with stored nutrients.
- 2) Mitochondrial matrix possesses single circular DNA molecule, a few RNA molecule, 70S ribosomes and the components required for the synthesis of proteins.
- 3) Lysosomes are single membrane bound vesicular structure that are very rich in almost all types of hydrolases.
- 4) A number of proteins synthesized by ribosomes are modified in the rough endoplasmic reticulum.

102. Given below are characteristic events of Anaphase I and Anaphase II. Classify them under proper heading.

- (a) Splitting of centromere of each chromosome
- (b) Homologous chromosomes separate from each other
- (c) Sister chromatids remain associated with each other at their centromeres
- (d) Sister chromatids move towards opposite poles of the cell.

	Anaphase I	Anaphase II
1)	(a), (b)	(c), (d)
2)	(b), (c)	(a), (d)
3)	(a), (b), (c)	(a), (d)
4)	(b), (c)	(b), (c), (d)

103. Spindle fibres are seen attached to ____ during ____.

- 1) Centromere, metaphase
- 2) Centromere, prophase
- 3) Kinetochore, prophase
- 4) Kinetochore, Metaphase

104. Match List I with List II.

	List I		List II
A.	PS I	I.	Photorespiration
B.	PS II	II.	Kranz anatomy
C.	C ₃ plants	III.	Photolysis of water
D.	C ₄ plants	IV	Cyclic photophosphorylation

Choose the correct answer from the options given below.

- 1) A – IV B – I C – III D – II
- 2) A – IV B – III C – II D – I
- 3) A – IV B – III C – I D – II
- 4) A – III B – II C – IV D – I

105. Who provided the evidence for the production of glucose when plant grows?

- 1) Julius von Sachs 2) Stephen Hales
- 3) Lavoisier 4) von Helmont

106. Consider the following statements:

- (a) It is a 4C compound.
- (b) It condenses with Acetyl CoA to form citric acid
- (c) It is produced from malic acid in the TCA cycle.

Which of the following molecules is represented by the information given above?

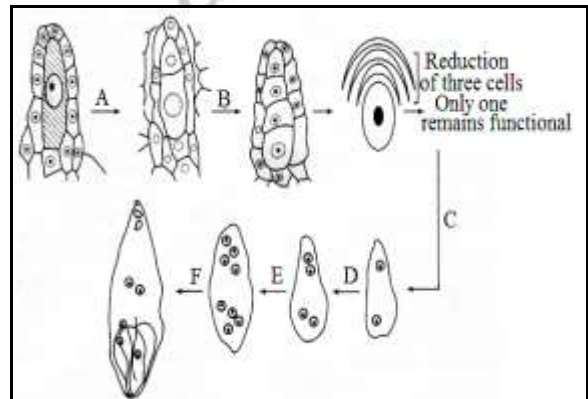
- 1) pyruvate 2) Oxaloacetate
- 3) Fumarate 4) Iso-Citrate

107. Which statement is wrong for a Krebs' cycle?
- 1) There is a single conversion in the cycle where FAD^+ is reduced to FADH_2
 - 2) During conversion of succinyl CoA to succinic acid, a molecule of GTP is synthesized
 - 3) The cycle involves formation of 3 carbon, 4 carbon, 5 carbon and 6 carbon intermediates
 - 4) There are three conversions in the cycle where NAD^+ is reduced to $\text{NADH} + \text{H}^+$
108. The term that includes all changes that an organism goes through during life cycle from germination to seed to senescence is :
- 1) Growth
 - 2) Maturation
 - 3) Development
 - 4) Differentiation or maturation
109. F. Skoog and his co workers added ____ in addition of auxin in the nutrient medium to observe proliferation of callus from internodal segment of tobacco.
- 1) Coconut milk or yeast extract only
 - 2) Coconut milk or DNA only
 - 3) Coconut milk or DNA or yeast extract or vascular tissue extract.
 - 4) Corn Kernel extract, vascular tissue extract, yeast extract or coconut milk
110. Citrus shows :
- (i) Apospory
 - (ii) Polyembryony
 - (iii) Free central placentation
 - (iv) Polyadelphous condition
- 1) (i), (ii), (iii), (iv)
 - 2) (ii), (iv)
 - 3) (ii), (iii), (iv)
 - 4) (i), (ii), (iv)

111. Fill in the blanks:

1. The male and female gametes in angiosperms are produced in the ...a... and ...b..., respectively.
 2. In angiosperms, both male and female gametes are ...c..., they have to be brought together for ...d... to occur. The ...e... is the mechanism to achieve this objective
- 1) a - pollen grain, b - embryo sac, c - motile, d - pollination, e - fertilisation
 - 2) a - generative cell, b - nucellus, c - non motile, d - pollination, e - fertilisation
 - 3) a - pollen grain, b - embryo sac, c - motile, d - fertilisation, e - pollination
 - 4) a - pollen grain, b - embryo sac, c - non motile, d - fertilisation, e - pollination

112. Identify A to F in diagram given below w.r.t. development female gametophyte in an Angiosperm.



- 1) A- Mitosis, B- Meiosis I, C- Meiosis II, D- Mitosis, E- Meiosis, F- Meiosis
- 2) A- Meiosis I, B- Meiosis II, C- Mitosis, D- Mitosis, E- Mitosis, F- Embryosac
- 3) A- Embryosac, B- Meiosis I, C- Meiosis II, D- Mitosis, E- Mitosis, F- Mitosis
- 4) A- Mitosis, B- Mitosis, C- Mitosis, D- Meiosis, E- Meiosis, F- Meiosis

113. Which of the following is put into Anaerobic sludge digester for further sewage treatment?

- 1) Effluents of primary treatment
- 2) activated sludge
- 3) Primary sludge
- 4) Floating debris

114. Identify the symbols of pedigree chart given below and the correct option with respect of A, B and C.



A



B



C

- 1) A- Male, B- Female, C- Sex unspecified
- 2) A- Male, B- Female, C- Sterile
- 3) A- Male, B- Female, C- Fertile
- 4) A- Female, B- Male, C- Sex unspecified

115. Read the following statements and identify set of correct statements.

- A. Disease Phenylketonuria is caused by mutation in gene that codes for the enzyme Phenylalanine hydrolase and is an example of pleiotropy
- B. β Thalasemia is controlled by two closely linked genes on chromosomes 11
- C. Colourblindness is a sex linked recessive disorder due to the defect in either red or green cone of eye resulting in failure to discriminate between red and green colour
- D. Sickle cell anemia is an autosome linked recessive trait in which mutant haemoglobin molecule undergoes polymerisation under low oxygen tension causing change in shape of RBC from biconcave disc to elongated sickle like structure.

- 1) C, D only 2) B, C, D only
- 3) A, C, D only 4) A, B, C, D

116. Ashish and Sneha are siblings of the same parents. Sneha is colourblind but Ashish has normal vision. What is true about their parents ?

- 1) Both parents must be colourblind.
- 2) Mother must be colourblind but father has normal vision
- 3) Mother must be carrier for colourblindness and father must be colourblind
- 4) Mother is carrier for colourblindness and father has normal vision

117. Match the following columns and select the correct option.

	Column I		Column II
A.	<i>Clostridium butylicum</i>	(I)	Cyclosporin A
B.	<i>Trichoderma polysporum</i>	(II)	Butyric Acid
C.	<i>Monascus purpureus</i>	(III)	Citric Acid
D.	<i>Aspergillus niger</i>	(IV)	Blood cholesterol lowering agent

- 1) A – I, B – II, C – IV, D – III
- 2) A – II, B – III, C – IV, D – I
- 3) A – II, B – IV, C – III, D – I
- 4) A – II, B – I, C – IV, D – III

118. Select the correct group of biocontrol agents.

- 1) *Bacillus thuringiensis*, Tobacco mosaic virus, Aphids
- 2) *Trichoderma*, *Baculovirus*, *Bacillus thuringiensis*
- 3) *Oscillatoria*, *Rhizobium*, *Trichoderma*
- 4) *Nostoc*, *Azospirillum*, Nucleopolyhedrovirus

119. Total number of round seeds in a Mendelian cross between pure yellow, round seeded pea plant and pure green wrinkled seeded pea plant in F_2 generation is.
- 1) 9/16 2) 12/16
 - 3) 3/16 4) 6/16
120. Gene gun method ...
- 1) is the method in which high velocity microparticles of DNA are coated with gold/ tungsten and then bombarded on recipient cell
 - 2) is the method in which high velocity microparticles of gold/ tungsten are coated with DNA & then such particles are bombarded on recipient cell.
 - 3) is the method in which heat shock is given to recombinant cells by keeping them in hot water bath
 - 4) is the method in which recombinant DNA is injected into host cell with microinjection.
121. Stirred-tank bioreactors have been designed to facilitate
- 1) Purification of product
 - 2) Addition of preservatives to the product
 - 3) Availability of oxygen throughout the process
 - 4) anaerobic conditions in the culture vessel.
122. If a researcher uses EcoRI to cut the gene of interest from source DNA, he must use ____ enzyme to cut the plasmid vector to ligate gene of interest to plasmid vector.
- 1) EcoRI only
 - 2) Hind II only
 - 3) any restriction enzyme
 - 4) DNA ligase
123. Using rDNA technology Hepatitis B vaccine is produced from:
- 1) Viruses 2) Streptococcus
 - 3) Yeast 4) Staphylococcus
124. Identify wrong statement W.r.t. prokaryotic ribosomes:
- 1) In prokaryotes, ribosomes are associated with the plasma membrane of cell.
 - 2) They are about 15nm by 20nm in size
 - 3) Their two subunits 50S and 30S when present together form 70 S ribosome.
 - 4) A ribosome may attach to a multiple m-RNA to form a polysome
125. Arrange the following terms given as A, B, C, D in increasing order of their size.
- A – communities, B – Biomes, C – Population, D – Ecosystems
- 1) $C \rightarrow B \rightarrow A \rightarrow D$
 - 2) $C \rightarrow A \rightarrow D \rightarrow B$
 - 3) $A \rightarrow B \rightarrow D \rightarrow C$
 - 4) $B \rightarrow C \rightarrow A \rightarrow D$

126. Which statement is wrong about Fungi?

- 1) Some Sac fungi are coprophilous
- 2) Fungi show cosmopolitan distribution
- 3) Mycelium of Albugo is aseptate and coenocytic
- 4) Ascospores are endogenous asexual spores of Aspergillus

127. Match Column - I with Column - II w.r.t. algae and their use and select the correct option from the codes given below.

	Column I		Column II
A.	Food	(I)	Brown algae
B.	Agar	(II)	Porphyra, Laminaria
C.	Algin	(III)	Gelidium, Gracilaria
D.	Carrageenin	(IV)	Red algae

- 1) A-(II), B-(III), C-(I), D-(IV)
- 2) A-(III), B-(II), C-(IV), D-(I)
- 3) A-(II), B-(III), C-(IV), D-(I)
- 4) A-(III), B-(II), C-(I), D-(IV)

128. $\oplus \overline{\sigma} \text{Epi}_{3 \rightarrow 8} \text{K}_{(5)} \text{C}_5 \text{A}_{\infty} \underline{\text{G}}_{(5)}$

This floral formula belongs to Family

- 1) Poaceae
- 2) Brassicaceae
- 3) Malvaceae
- 4) Leguminosae

129. The hypodermis of dicot stem shows.

- 1) Sclerenchyma only
- 2) Collenchyma only
- 3) Parenchyma only
- 4) Parenchyma and Collenchyma

130. Barnacles show commensalism with:

- 1) Whale
- 2) Clown fish
- 3) Shark
- 4) Starfish

131. Arrange the following events of meiosis in a correct sequence and choose the correct option

- I. Terminalisation
- II. Crossing over
- III. Synapsis
- IV. Separation of Chromatids

- 1) IV, III, II and I
- 2) III, II, I and IV
- 3) II, I, IV and III
- 4) I, IV, III and II

132. Mark the compound which would be absent in bundle sheath of sugarcane plant during photosynthesis.

- 1) oxaloacetic acid
- 2) malic acid
- 3) RuBP
- 4) phosphoglycerate

133. The number of molecules of pyruvic acid formed from one molecule of glucose at the end of glycolysis is -

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

134. _____ is a natural auxin.

- 1) IAA
- 2) NAA
- 3) 2, 4 - D
- 4) 2, 4, 5, - T

135. A 2000 years old viable seed is of:

- 1) Lupin
- 2) Orobanche
- 3) Phoenix dactylifera
- 4) Orchid

136. Hershey and Chase selected radioactive sulphur and phosphorus and not radioactive carbon and Hydrogen for their experiments because

- A. Radioactive Carbon & Hydrogen can be incorporated both in proteins and nucleic acids.
- B. Radioactive carbon & Hydrogen do not get incorporated in nucleic acids.
- C. Radioactive Sulphur can be exclusively get incorporated in nucleic acid and radioactive phosphorus in proteins.
- D. Radioactive Sulphur get incorporated exclusively in proteins and radioactive phosphorus in nucleic acids.

Choose the correct answer from the options given below.

- 1) A & C only 2) A & D only
- 3) A & B only 4) B & D only

137. Which is incorrect about thyroid hormones?

- 1) Thyroid hormones (T_3 and T_4) are synthesised by follicular cells.
- 2) Thyroid hormones support the process of red blood cell formation.
- 3) Thyroid hormones control the metabolism of carbohydrates, proteins and fats
- 4) Maintenance of water and electrolyte balance is influenced by thyrocalcitonin

138. Synapsids are ancestors of

- 1) Mammals 2) Birds and mammals
- 3) Dinosaurs 4) Modern reptiles

139. Match the Columns:

	Column I		Column II
I.	Operator gene	A.	Binding site for RNA polymerase
II.	Promoter gene	B.	Binding site for repressor molecule
III.	Structural gene	C.	Codes for enzyme
IV.	Regulator gene	D.	Code for repressor molecule

The correct match is

- 1) I – B, II – A, III – C, IV – D
- 2) I – B, II – A, III – D, IV – C
- 3) I – A, II – B, III – C, IV – D
- 4) I – B, II – C, III – A, IV – D

140. Match List I with List II.

	List I		List II
A.	Chemical Synapse	I.	Action potential
B.	Electrical Synapse	II.	Myelinated nerve fibre
C.	Saltatory conduction of impulse	III.	Synaptic cleft, between pre and post synaptic membrane
D.	Nerve impulse	IV.	Direct transmission of impulse from neuron to neuron

- 1) A – III, B – IV, C – II, D – I
- 2) A – III, B – I, C – II, D – IV
- 3) A – II, B – IV, C – I, D – III
- 4) A – I, B – IV, C – III, D – II

141. Mark the wrong taxonomic category for *Triticum aestivum*.

- 1) Order: Poales
- 2) Class: Monocotyledonae
- 3) Family: Anacardiaceae
- 4) Division: Angiospermae

142. Given below are two statements

Statement I: In urochordates, notochord is present only in larval tail but absent in adults.

Statement II: In cephalochordates notochord is absent in adults but present through out the body in larval stage.

- 1) Statement I is false but Statement II is true
- 2) Both Statement I and Statement II are true
- 3) Both Statement I and statement II are false
- 4) Statement I is true but Statement II is false.

143. Identify the correct statements w.r.t. chordates.

- A. They have dorsal, solid nerve cord.
- B. They have paired pharyngeal gill slits.
- C. They are triploblastic, coelomate with radial or bilateral symmetry.
- D. They possess post anal tail
- E. They have closed circulatory system with ventral heart

- 1) A, B, C, D, E
- 2) B, C, D, E only
- 3) B, D, E only
- 4) A, B, D, E only

144. The ground substance in a connective tissue is also called ____ and is made up of ____.

- 1) Matrix, Modified protein
- 2) Stroma, Modified protein
- 3) Stroma, Modified polysaccharide
- 4) Matrix, polysaccharide

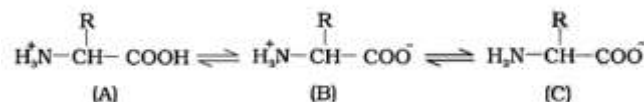
145. In female cockroach brood or genital pouch is formed by

- 1) 8th, 9th and 10th Sterna
- 2) 8th, 9th and 10th Terga
- 3) 7th, 8th and 9th Sterna
- 4) 7th, 8th and 9th Terga

146. The frogs have the ability to change its colour to hide them from their enemies. This protective colouration is called:

- 1) hibernation
- 2) aestivation
- 3) mimicry
- 4) camouflage

147. Which of the following represents zwitter ion?



- 1) A only
- 2) A, B only
- 3) A, C only
- 4) B only

148. Identify the correct statement

- 1) Paper made from plant pulp and cotton fibres are made of glucosamine
- 2) Cellulose contains complex helices in which I_2 is held and hence gives blue colour
- 3) Activity of malonate is inhibited by succinic dehydrogenase
- 4) Sequence of amino acids in a polypeptide represents primary structure of protein

149. Identify the correct and incorrect match about respiratory volumes and capacities and mark the correct option:

- (i) $IC = TV + RV$
- (ii) $VC = TV + IRV + ERV$
- (iii) $RV = VC + IRV$
- (iv) $TV = IC - IRV$

(TV - tidal volume, IRV - inspiratory reserve volume, ERV - expiratory reserve volume, RV - residual volume, IC - inspiratory capacity, VC - vital capacity)

- 1) i, ii, iii - incorrect, iv- correct
- 2) i, iii - incorrect, ii, iv – correct
- 3) i, ii, iv - correct, iii – incorrect
- 4) i, iii - correct, ii, iv - incorrect

150. In the alveoli, the factors favourable for the formation of oxyhaemoglobin are:

- | | |
|-----------------------|-----------------|
| A. Low pO_2 | B. High pO_2 |
| C. Low pCO_2 | D. High pCO_2 |
| E. Lower temperature | |
| F. Higher temperature | |
| G. Low pH | H. High pH |

- | | |
|---------------|---------------|
| 1) A, D, F, H | 2) B, C, E, G |
| 3) A, D, F, G | 4) B, C, E, H |

151. Identify the correct sequence of route of blood clotting.

- A. Thrombokinase release
- B. Cascade process
- C. Fibrin formation
- D. Thrombin formation

Choose the correct answer from the options given below.

- | | |
|--|--|
| 1) $B \rightarrow D \rightarrow A \rightarrow C$ | 2) $D \rightarrow C \rightarrow A \rightarrow B$ |
| 3) $B \rightarrow A \rightarrow D \rightarrow C$ | 4) $C \rightarrow D \rightarrow B \rightarrow A$ |

152. AV node in human heart is present at:

- 1) lower right corner of left atrium
- 2) lower left corner of right atrium
- 3) lower left corner of right ventricle
- 4) upper left corner of right atrium

153. Indicate whether the following statements are true (T) or false (F).

- a. Micturition is carried out by a micturition reflex which is a neural mechanism.
- b. PCT causes tubular secretion of H^+ , ammonia and HCO_3^- .
- c. Protein-free fluid is filtered from blood plasma into the Bowman's capsule.
- d. Collecting duct extends from cortex of kidney to inner part of medulla.
- e. Glucose is actively reabsorbed in the proximal convoluted tubule.

- 1) a - T, b - F, c - T, d - T, e - T
- 2) a - T, b - F, c - T, d - F, e - T
- 3) a - F, b - T, c - F, d - T, e - F
- 4) a - T, b - F, c - F, d - T, e - T

154. Identify the mismatched pair.

- 1) PCT – Squamous epithelium
- 2) DCT – Cuboidal epithelium
- 3) Descending limb of Henle's loop – Squamous epithelium
- 4) Ascending limb of Henle's loop – cuboidal epithelium

155. Read the following statements and find out the incorrect statements.

- a. Skeletal muscle shows many nuclei in its cytoplasm.
- b. Along with pseudopodia cytoskeletal elements like micro filaments are also involved in amoeboid movement.
- c. Movement of cilia, flagella and tentacles are shown by Euglena, Paramecium and Hydra respectively.
- d. Z-line is present in the centre of dark band.
- e. During muscle contraction the length of dark band remains constant but H – zone decreases.

- 1) a and b 2) b and c
- 3) c and d 4) d and e

156. An, Ilium, Ischium and pubis bone fuse to form :

- 1) a complete pectoral girdle
- 2) a complete pelvic girdle
- 3) a caudal bone
- 4) a coxal bone

157. Limbic system or limbic lobe is formed by

- a. Hippocampus
- b. Amygdala
- c. Pituitary gland
- d. Outer parts of cerebral hemispheres
- e. Inner parts of cerebral hemispheres

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

158. Match the columns and choose correct options.

	Column I		Column II
A)	ANF	I.	Regulates blood calcium level
B)	MSH	II.	Decreases blood pressure
C)	GIP	III.	Pigmentation
D)	TCT	IV.	Inhibits gastric secretion

- 1) A - II, B - III, C - IV, D - I
- 2) A - IV, B - I, C - II, D - III
- 3) A - II, B - I, C - IV, D - III
- 4) A - IV, B - I, C - r, D - II

159. When the neuron is resting the axonal membrane is ___ to negatively charged proteins present in the axoplasm.

- 1) Permeable
- 2) Partially permeable
- 3) Impermeable
- 4) Selectively permeable

160. Hypothyroidism during pregnancy causes defective development and maturation of growing baby leading to

- Cretinism (stunted growth)
- increased BMR
- Mental retardation
- Low intelligence quotient (I.Q.)
- Abnormal skin
- Deaf-mutism

- 1) a, b, d and f 2) b, c, d and e
- 3) a, c, d, e and f 4) a, b, c, d, e and f

161. Read the following statements with respect to oogenesis. Find the incorrect statement.

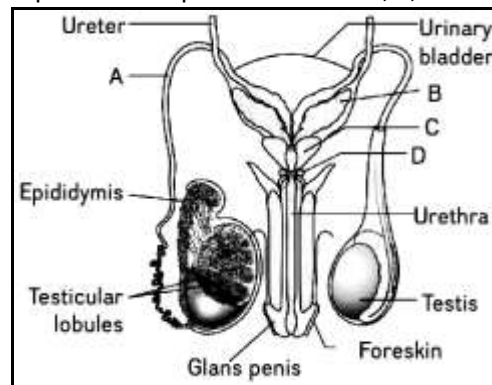
- 1) Meiosis I is arrested in prophase stage in embryonic life.
- 2) The first polar body retains a very small amount of cytoplasm from primary oocyte.
- 3) At puberty, both ovaries together have 60,000 to 80,000 functional follicles.
- 4) A primary oocyte ultimately may forms one ovum after completion of meiosis.

162. Administration of which of the following within 72 hours of coitus is effective as contraceptive :

- Progestogens
- Progestogen – oestrogen
- IUDs
- cervical cap

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

163. Refer to the given figure and choose the correct option for the parts labelled as A, B, C and D.



	A	B	C	D
1	Vas deferens	Seminal vesicle	Prostate gland	Bulbourethral gland
2	Vasa efferentia	Prostate gland	Seminal vesicle	Bulbourethral gland
3	Prostate gland	Seminal vesicle	Bulbourethral gland	Vas deferens
4	Bulbourethral gland	Vas deferens	Prostate gland	Vasa efferentia

164. Identify the incorrect statement w.r.t. DNA replication.

- 1) During DNA replication, on the template strand with polarity $3' \rightarrow 5'$, the replication is continuous and the newly synthesized strand is called leading strand.
- 2) On the template having polarity $5' \rightarrow 3'$, the new strand is synthesized discontinuously called lagging strand.
- 3) The fragments of lagging strand are called Okazaki fragments which are joined by DNA ligase enzyme.
- 4) DNA polymerase catalyses polymerisation only in one direction that is $3' \rightarrow 5'$ of new strand.

165. The precursor of m-RNA is ____ which is synthesized by ____.
- 1) hn RNA, RNA polymerase II
 - 2) sn RNA, RNA polymerase II
 - 3) hn RNA, RNA polymerase I
 - 4) hn RNA, RNA polymerase III
166. Which of the following modification will prevent the polymerization of nucleotides to form a strand of DNA in vivo?
- 1) replacing purines by pyrimidines
 - 2) removal of 2' OH group of deoxyribose sugar
 - 3) removal of 3' OH group of deoxyribose sugar
 - 4) removal of 5' OH group of ribose sugar
167. Brain (cranial) capacity of *Homo habilis* was
- 1) 750 – 850 cc 2) 750 – 800 cc
 - 3) 650 – 800 cc 4) 550 – 700 cc
168. Given below are two statements:
- Statement I :** Evolution of modern man appears to parallel evolution of human brain and language.
- Statement II :** *Homo habilis* had the smallest brain capacity of 650-800cc.
- In the light of the above statements, choose the most appropriate answer from the options 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 incorrect
 - 4) Both Statement I and Statement II are correct
169. Chemical evolution refers to:
- 1) Formation of diverse inorganic molecules from organic constituents
 - 2) Formation of diverse organic molecules from radioactive constituents
 - 3) Formation of diverse organic molecules from inorganic constituents
 - 4) Formation of diverse non-reducing molecules from inorganic constituents
170. Which of the following human parasites require mosquito to complete their life cycle?
- 1) *Ascaris* and *Wuchereria*
 - 2) *Ascaris* and *salmonella*
 - 3) *Salmonella* and *Plasmodium*
 - 4) *Plasmodium* and *Wuchereria*
171. Read the following statements and select the correct option.
- Statement I:** The injection given to patient of snake bite generates artificial active immunity
- Statement II:** Colostrum gives natural passive immunity to the newborn.
- 1) Statement I is false but Statement II is true
 - 2) Statement I is true but Statement II is false.
 - 3) Both Statement I and Statement II are true
 - 4) Both Statement I and statement II are false
172. Drugs used to reduce the symptoms of allergy quickly
- | | |
|----------------------|----------------------------|
| (i) Histaminic drugs | (ii) Adrenaline |
| (iii) Steroids | (iv) α -interferons |
- 1) i, ii and iii 2) i, ii and iv
 - 3) ii and iii 4) i and ii

173. If in a pond there are 20 lotus plants of last year and through reproduction 8 new plants are added. Then the birth rate is:

- 1) 0.8 offspring per lotus per year
- 2) 0.2 offspring per lotus per year
- 3) 0.4 offspring per lotus per year
- 4) 0.6 offspring per lotus per year

174. Logistic growth is represented by which equation.

- 1) $\frac{dN}{dt} = rN \left(\frac{K-N}{K} \right)$
- 2) $\frac{dN}{dt} = rN \left(\frac{K-N}{N} \right)$
- 3) $\frac{dN}{dt} = rN \left(\frac{K+N}{K} \right)$
- 4) $\frac{dN}{dt} = rN \left(\frac{K}{K+N} \right)$

175. Ecologists suggest that the life history traits of organisms have evolved in relation to the constraints imposed by.

- 1) Abiotic and biotic components of habitat
- 2) Food chain
- 3) Struggle for existence
- 4) Natural selection

176. Metagenesis is seen in:

- 1) Physalia
- 2) Meandrina
- 3) Pleurobrachia
- 4) Obelia

177. In cockroach the hardened exoskeleton plates are called ___ dorsally and ___ ventrally.

- 1) Sclerites, sternites
- 2) Sternites, tergites
- 3) Sternites, sclerites
- 4) Tergites, Sternites

178. Match the Column I with Column II correctly :

	Column I (Category)		Column II (Secondary Metabolites)
A.	Pigments	I.	Concanavalin A
B.	Polymeric substance	II.	Rubber
C.	Alkaloids	III.	Morphine, Cadeine
D.	Lectins	IV.	Carotenoids, Anthocyanin

- 1) A - IV, B - II, C - III, D - I
- 2) A - IV, B - II, C - I, D - III
- 3) A - I, B - II, C - III, D - IV
- 4) A - I, B - III, C - II, D - IV

179. A correct systemic circulation pathway is

- 1) Right atrium → Right ventricle → Aorta → arteries → Tissues → Veins → Left atrium
- 2) Right ventricle → Pulmonary aorta → Tissues → Pulmonary veins → Left atrium
- 3) Left atrium → Left ventricle → Aorta → Arteries → Tissues → Veins → Right atrium
- 4) Left atrium → Left ventricle → Pulmonary aorta → Tissues → Right atrium.

180. Read the following statements and find out the incorrect statement.

- 1) Though the heart is autoexcitable, its functions can be moderated by neural and hormonal mechanisms.
- 2) Angina pectoris can occur in men and women of any age but it is more common among the middle- aged and elderly.
- 3) Heart failure is same as cardiac arrest or heart attack.
- 4) CAD is caused by deposits of calcium, fat, cholesterol and fibrous tissues, which makes the lumen of arteries narrower
