## MP Murlidhar Mohol & APMA initiative

TIME: 3 HRS. DATE: 19.04.2025 **Mission NEET 2025** PAPER - III

PCB : ENTIRE XI + XII NCERT

**MARKS: 720** 

## Note:

- Every correct answer (+4 Mark)
- Every wrong answer (-1 Mark)
- Not attempted question (0 Mark)
- The mass of the liquid flowing per second per 1. unit area of cross section of the tube is proportional to  $P^x$  and  $v^y$ , where P is the pressure difference and v is the velocity, then the relation between x and y is
  - 1) x = y2) x = -y
  - 3)  $v^2 = x$ 4)  $v = -x^{2}$
- 2. The relation between time t and distance x is t =  $\alpha x^2$  +  $\beta x$  where  $\alpha$  and  $\beta$  are constants. The retardation is
  - $2\alpha v^3$ 1) 2)  $2\beta v^3$ 3)  $2\alpha\beta\nu^{3}$ 
    - $2\beta^2\nu^3$
- What is the magnetic field at the centre of a coil 3. in the form of a square of side  $4\sqrt{2}$  cm and carrying a current of 4 A?
  - $8 \times 10^{-7} \mathrm{T}$  $6 \times 10^{-7} \, \mathrm{T}$ 1) 2)  $4 \times 10^{-7} \,\mathrm{T}$  $3 \times 10^{-7} \,\mathrm{T}$ 4) 3)

- In an NCC training camp, a cadet fired a bullet of 4. mass 50 gram with a speed of 200 m/s, on a soft plywood board of thickness 20 mm. It was found that the kinetic energy of the emerging bullet was only 25% of its initial K.E. What is the percentage decrease in the speed of the bullet?
  - 50% 1) 25% 2)

3)

- 60% 75% 4)
- 5. A rubber ball is dropped on the ground from a height of 1 m. What is the height to which the ball will rebound, if the coefficient of restitution between the ball and the ground is 0.8?
  - 1) 0.5 m 2) 0.25 m 3) 0.64 m 4) 0.8 m
- 6. The ratio of the kinetic energy required to be given to a satellite to escape from the earths gravity to the kinetic energy required to be given to it so that it moves in a circular orbit just above the earth's surface is :
  - $\sqrt{2}$ 1) 2) 4 3) 2√2 4) 2
- 1

7. Radiation of wavelength  $\lambda$  is incident on a photocell fastest emitted electron has speed v. If the wavelength is changed to  $\frac{3\lambda}{4}$ , the speed of the fastest emitted electron will be

1)	$> v \left(\frac{4}{3}\right)^{1/2}$	2)	$< v \left(\frac{4}{3}\right)^{1/2}$
3)	$= v \left(\frac{4}{3}\right)^{1/2}$	4)	$= v \left(\frac{3}{4}\right)^{1/2}$

- A circular disc X of radius R is made from an iron plate of thickness t, and another disc Y of radius 4R is made from an iron plate of thickness t/4. Then the relation between the moment of inertia I<sub>x</sub> and I<sub>Y</sub> is
  - 1)  $I_Y = 64I_X$ 2)  $I_Y = 32I_X$ 3)  $I_Y = 16I_X$ 4)  $I_Y = I_X$
- 9. Two discs of moment of inertia  $I_1$  and  $I_2$  and angular speeds  $\omega_1$  and  $\omega_2$  are rotating along collinear axes passing through their centre of mass and perpendicular to their plane. If the two are made to rotate together along the same axis the rotational KE of system will be

1) 
$$\frac{l_1\omega_1 + l_2\omega_1}{2(l_1 + l_2)}$$
  
2)  $\frac{(l_1 + l_2)(\omega_1 + \omega_2)}{2(l_1 + l_2)(\omega_1 + \omega_2)}$ 

2

- 3)  $\frac{(I_1\omega_1 + I_2\omega_2)^2}{2(I_1 + I_2)}$
- 4) None of these

- 10. Two rods of different materials having coefficients of linear expansion  $\alpha_1$ ,  $\alpha_2$  and Young's moduli Y<sub>1</sub> and Y<sub>2</sub>, respectively, are fixed between two rigid massive walls. The rods are heated such that they undergo the same increase in temperature. There is no bending of rods. If  $\alpha_1$  :  $\alpha_2$  = 2 : 3, the thermal stresses developed in the two rods are equal provided, Y<sub>1</sub> : Y<sub>2</sub> is equal to
  - 1)
     2:3
     2)
     1:1

     3)
     3:2
     4)
     4:9
- 11. The reading of a pressure gauge attached to a closed horizontal pipe was  $3.5 \times 10^5$  Pa. When the value of the pipe was opened, the pressure was reduced to  $3 \times 10^5$  Pa. What was the speed of water flowing out of the pipe?

 A large number of water drops each of radius r combine to have a drop of radius R. If the surface tension is T and the mechanical equivalent of heat is J, then the rise in temperature will be

1) 
$$\frac{2T}{rJ}$$
 2)  $\frac{3T}{RJ}$   
3)  $\frac{3T}{J}\left(\frac{1}{r}-\frac{1}{R}\right)$  4)  $\frac{2T}{J}\left(\frac{1}{r}-\frac{1}{R}\right)$ 

 A substance of mass m kg requires a power input of P watts to remain in the molten state at its melting point. When the power is turned off, the sample completely solidifies in time t sec. What is the latent heat of fusion of the substance

1)	Pm t	2)	Pt m
3)	<u>m</u> Pt	4)	t Pm

- 14. The value of  $C_P C_v = 1.00$  R for a gas in state A and  $C_p - C_v = 1.06$ R in another state. If  $P_A$  and  $P_B$ denote the pressure and  $T_A$  and  $T_B$  denote the temperatures in the two states, then
  - 1) $P_A = P_B, T_A > T_B$ 2) $P_A > P_B, T_A = T_B$ 3) $P_A < P_B, T_A > T_B$ 4) $P_A = P_B, T_A < T_B$
- 15. During an adiabatic process, the pressure of a gas is found to be proportional to the cube of its absolute temperature. The ratio  $C_p / C_v$  for the gas is

3 5

- 1)  $\frac{3}{2}$  2) 3) 2 4)
- 16. A particle of mass m is executing oscillations about the origin on the x-axis. Its potential energy is  $U(x) = k[x]^3$ , where k is a positive constant. If the amplitude of oscillation is a, then its time period T is
  - 1) Proportional to  $\frac{1}{\sqrt{a}}$
  - 2) Independent of a
  - 3) Proportional to  $\sqrt{a}$
  - 4) Proportional to  $a^{3/2}$

17. What is the output X of the following logic gate circuit?



- 3) 1.5 m/s 4) 4.5 m/s
- 20. Two point charges 100  $\mu$ C and 5  $\mu$ C are placed at points A and B respectively with AB = 40 cm.
- 3

The work done by external force in displacing the charge 5  $\mu$ C from B to C, where BC = 30 cm, angle ABC =  $\pi/2$  and  $1/4 \pi \epsilon_0 = 9 \times 10^9 \text{ Nm}^2/\text{C}^2$ 

2)  $\frac{81}{20}$  J 9J 1)

3) 
$$\frac{9}{25}$$
 J 4)  $-\frac{9}{4}$  J

- Electric potential is given by 21.  $V = 6x - 8xy^2 - 8y + 6yz - 4z^2$ Then electric force acting on 2C point charge placed on origin will be 2 N 1) 2) 6 N
  - 3) 8N 4) 20 N
- Two wires of the same material and length are 22. stretched by the same force. If the ratio of the radii of the two wires is n : 1 then the ratio of their elongation is
  - $n^2:1$  $1:n^{2}$ 1) 2) 3) 1 : n 4) n = 1
- 23. If in the circuit shown below, the internal resistance of the battery is 1.5  $\Omega$  and V<sub>P</sub> and V<sub>Q</sub> are the potentials at P and Q respectively, what is the potential difference between the points P and Q 20 V 150

1)	zero

4)

4 volt ( $V_P > V_Q$ ) 2) 3) 4 volt ( $V_Q > V_P$ )

Q and a second s		<u> </u>	132	
zero		+ 1'-		
4 volt ( $V_P > V_Q$ )	<u>3Ω</u>	P	2Ω 	
4 volt (V <sub>Q</sub> > V <sub>P</sub> )	****	-		
2.5 volt ( $V_0 > V_P$ )	2 Ω	Q	3Ω	

24. The relative permeability is represented by  $\mu_r$ and the susceptibility is denoted by  $\chi$  for a

magnetic substance. Then for a paramagnetic substance

- 1)  $\mu_r < 1, \chi < 0$ μ<sub>r</sub> < 1, χ > 0
- 3)  $\mu_r > 1, \chi < 0$ 4) μ<sub>r</sub> > 1, χ > 0
- 25. A long wire AB is placed on a table. Another wire PQ of mass 1.0 g and length 50 cm is set to slide on two rails PS and QR. A current of 50 A is passed through the wires. At what distance above AB, will the wire PQ be in equilibrium



- 26. Five very long insulated straight wires are bound together to form a small cable. Currents carried by the wires are  $I_1 = 20$  A,  $I_2 = -5$ A,  $I_3 = 10$  A,  $I_4 = +7A$  and  $I_5 = -12A$ . What is the magnetic induction at a perpendicular distance of 5 cm from the cable?
  - 1) 60 μT 2) 70 µT
  - 3) 75 μT 4) 80 μT
- 27. The magnetic field at the centre of a current carrying circular coil of area A is B. What is the magnetic moment of the coil?
- 4

1) 
$$\frac{BA^2}{\mu_0 \pi}$$
 2)  $\frac{2BA^{3/2}}{\mu_0 \pi^{1/2}}$   
3)  $\frac{BA^{3/2}}{\mu_0 \pi}$  4)  $\frac{\mu_0 \pi^{1/2}}{BA^{3/2}}$ 

28. A transformer having an efficiency of 90% is working on 200 V and 3 kW power supply. If the current in the secondary coil is 6 A, the voltage across the secondary coil and the current in the primary coil respective are

1)	450 V <i>,</i> 13.5 A	2)	600 V, 15 A
3)	300 V <i>,</i> 15 A	4)	450 V, 15 A

- 29. A group of electric lamps having a total power rating of 1000 watt is supplied by an ac voltage  $E = 200 \sin(310t + 60^\circ)$ . Then the rms value of the circuit current is
  - 10√2A 2) 10 A 1)
  - 20√2A 4) 3) 20 A
- 30. The value of the current I in the given circuit is



1)

31. To find the resistance of a gold bangle, two diametrically opposite points of the bangle are connected to the two terminal of the left gap of a metre bridge. A resistance of 4  $\Omega$  is introduced in the right gap. What is the resistance of the bangle if the null point is at 20 cm from the left end?

1)	2 Ω	2)	4Ω

 8Ω 4)  $16 \Omega$ 

32. A ray of light is incident at the glass-water interface at an angle i, it emerges finally parallel to the surface of water, then the value of  $\mu_g$ 



33. The image of an object approaching a convex mirror of radius of curvature 20 m along its optical axis is observed to move from  $\frac{25}{3}$  m to

 $\frac{50}{7}$  m in 30 second. What is the speed of the

object in km per hour ?

1)

3)

5

1) 5 km/h	2)	4 km/h
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3) 3 km/h 4) 2 km/h

34. In a YDSE bichromatic lights of wavelengths 400 nm and 560 nm are used. The distance between the slits is 0.1 mm and the distance between the plane of the slits and the screen is 1m. The minimum distance between two successive regions of complete darkness is

1) 4 mm	2)	5.6 mm
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- 3) 14 mm 4) 28 mm
- 35. Light from a hydrogen discharge tube is incident on the cathode of a photoelectric cell. The work function of the cathode surface is 4.2 eV. In order to reduce the photo-current to zero the voltage of the anode relative to the cathode must be made
  - 1) -4.2 V 2) -9.4 V 3) -17.8 V 4) +9.4 V
- From the figure describing photoelectric effect, we may infer correctly that



- 1) Na and Al both have the same threshold frequency
- 2) Maximum kinetic energy for both the metals depend linearly on the frequency.
- 3) The stopping potentials are different for Na and Al for the same change in frequency
- 4) Al is a better photosensitive material than Na.
- 37. An electron jumps from the fourth orbit to the second orbit of hydrogen atom. Given: the

Rydberg's constant  $R = 10^5$  cm<sup>-1</sup>. The frequency, in Hz, of the emitted radiation will be

1) 
$$\frac{3}{16} \times 10^5$$
  
2)  $\frac{3}{6} \times 10^{15}$   
3)  $\frac{9}{16} \times 10^5$   
4)  $\frac{9}{16} \times 10^{15}$ 

38. Among the above four circuits that have two pn junctions connected in series with battery in which of the circuit p.d. across the two p-n junction is not equal



3) both '1' and '2' 4) neit

4) neither '1' nor '2'

39. In the following circuit  $I_1$  and  $I_2$  are respectively



- 40. In hydrogen atom, if the difference in the energy of the electron in n = 2 and n = 3 Orbits is E, the ionization energy of hydrogen atom is
  - 1)
     13.2 E
     2)
     7.2 E

     3)
     5.6 E
     4)
     3.2 E
- 41. If the current flowing in a coil is reduced to half of its original value, the relation between the new energy  $(E_2)$  and the original energy  $(E_1)$  stored in the coil will be
  - 1)  $E_2 = E_1$ 2)  $E_2 = 2E_1$ 3)  $E_2 = \frac{1}{2}E_1$ 4)  $E_2 = \frac{1}{4}E_1$
- 42. When light of frequency v falls on a metal surface, the maximum velocity of the electrons emitted from the surface is v. What will be the maximum velocity of the ejected electrons, if the frequency is increased to 4v?
  - 1) 2v
  - 2) more than 2v
  - 3) less than 2v
  - 4) between v and 1.5 v
- 43. A voltmeter has a resistance G  $\Omega$  and range V volt. The value of resistance used in series to convert it into voltmeter of range 'nV' volt is

4)

- 1) n G 💛 2) G/n
- 3) (n 1) G

G/(n – 1)

7

44. What is the output X in the following logic gate circuit?



- 45. A boy of mass 40 kg wants to climb up a rope hanging vertically. The rope can withstand a maximum tension of 500 N. What is the maximum acceleration with which the boy can climb the rope? Take  $g = 10 \text{ m/s}^2$ 
  - 1) 1.5 m/s<sup>2</sup> 2) 2.0 m/s<sup>2</sup>
  - 3) 2.5 m/s<sup>2</sup> 4) 3.0 m/s<sup>2</sup>
- Given below are two statements one is labelled as Assertion (A) other is labelled as Reason (R).
   Assertion (A): CICH<sub>2</sub>COOH is more acidic than CH<sub>3</sub>COOH.

**Reason (R):** Due to -I effect of Cl, pK<sub>a</sub> of carboxylic acid increases.

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

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

- 47. The freezing point (in °C) of a solution containing  $0.1 \text{ g of } K_3[Fe(CN)_6] \text{ (mol. wt. = 329) in 100 g of }$ water is  $(K_f = 1.86 \text{ K kg mol}^{-1})$ 1)  $-2.3 \times 10^{-2}$ 2) 0.023 3)  $-5.7 \times 10^{-3}$ 4)  $-1.2 \times 10^{-2}$ The correct order of first ionization enthalpy 48. values of the following elements is : (A) O (B) N (C) Be (D) F (E) B Choose the correct answer from the options given below : 1) B < D < C < E < A 2) E < C < A < B < D3) C < E < A < B < D 4) A < B < D < C < E Which among the following will give iodoform 49. test? (a) CH<sub>3</sub>CHO (b) CH<sub>3</sub>CH<sub>2</sub>CHO (c) ICH<sub>2</sub>CHO (d) HCHO 1) (a) Only 2) (a) & (b) Only 3) (a) & (c) Only (a), (b) & (c) Only 4) At 500 K, the half-life period of a gaseous 50. reaction at an initial pressure of 100 kPa is 364 s. When the pressure is 50 kPa, the half-life
  - 1) zero 2) one

period is 182 s. The order of the reaction is

3) half 4) two

51. **Statement-I** : lonic bond formation is a redox reaction

**Statement-II** : The stability of an ionic compound is provided by its enthalpy of lattice formation & not simply by achieving octet of  $e^-$  around ionic species.

- 1) Both statement I and statement II are true
- 2) Statement I is true but statement II is false
- 3) Both statement I and statement II are false
- 4) Statement I is false but statement II is true
- 52. The number of correct reaction(s) among the following is \_\_\_\_\_.



53. In the given set of reactions

> AgCN(alc) 2-Bromobutane Х

> > (major)

LiAlH<sub>4</sub>

The IUPAC name of product "Y" is

- 1) Butan-2-amine
- 2) N-Methylbutanamine
- N-IsobutyImethanamine 3)
- N-Methylbutan-2-amine 4)
- 54. In Carius method, 0.099 g of organic compound gives 0.287 g of AgCl. The percentage of chlorine in the compound will be
  - 71.71% 1) 2) 29.39%
  - 3) 53.06% 4) 76.23%
- 55. Consider the following reaction  $MnO_2 + KOH + O_2 \rightarrow A + H_2O.$ Product 'A' in acidic medium disproportionate to give products 'B' and 'C' along with water. The sum of spin-only magnetic moment values of B and C is \_\_\_\_BM. (nearest integer) (Given atomic number of Mn is 25)
  - 1) 2 3 2) 4) 5
  - 3) 4

Consider the following statements. 56.

> Statement (I): Allylic and benzylic halides show high reactivity towards S<sub>N</sub>1 reaction.

Statement (II): The allylic and benzylic carbocations get stabilised through resonance. 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
- Both statement (I) and statement (II) are 4) incorrect

In the reaction,  $N_2O_4 \implies 2NO_2$ ,  $\alpha$  is that part 57. of  $N_2O_4$  which dissociates, then the number of moles at equilibrium will be

1) $(1 - \alpha)^2$	2)	3α
3) α	4)	<b>1</b> + α

- When  $MnO_2$  and  $H_2SO_4$  is added to a salt (A), the 58. greenish yellow gas liberated as salt (A) is :
  - 1) NaBr 2) Cal<sub>2</sub>
  - 4) 3) KNO<sub>3</sub> NH<sub>4</sub>Cl



- 60. What are the possible values of n, *l* and m for an atomic orbital 4*f*?
  - 1) n = 4, / = 0, 1, 2, 3, m = -2, -1, 0, +1, +2
  - 2) n = 4, / = 3, m = -3, -2, -1, 0, +1, +2, +3
  - 3) n = 4, l = 2, m = -2, -1, 0, +1, +2, +3
  - 4) n = 4, / = 0, m = -1, 0, +1

61. Given below are two statements

**Statement-I** : Along the period, the chemical reactivity of the element gradually increase from group 1 to group 18

**Statement-II**: The nature of oxides formed by group 1 elements is basic while that of group 17 elements (Cl, Br, I) acidic

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

- 1) Both statement I and statement II are true
- 2) Statement I is true but statement II is false
- 3) Both statement I and statement II are false
- 4) Statement I is false but statement II is true
- 62. If an iron (III) complex with the formula  $[Fe(NH_3)_x(CN)_y]^-$  has no electron in its  $e_g$  orbital, then the value of x + y is
  - 1)
     5
     2)
     6

     3)
     3
     4)
     4

63. The ratio of total number of  $\sigma$  bonds to the total number of  $\pi$  bonds present in naphthalene is

1)	4:1	2)	19 : 5
3)	3:1	4)	21:5

1)	4	2)	6
3)	8	4)	10

- 65. For a strong electrolyte, a plot of molar conductivity against (concentration)<sup>1/2</sup> is a straight line, with a negative slope, the correct unit for the slope is
  - 1) S cm<sup>2</sup> mol<sup>-3/2</sup> L<sup>1/2</sup> 2) S cm<sup>2</sup> mol<sup>-1</sup> L<sup>1/2</sup>
  - 3) S cm<sup>2</sup> mol<sup>-3/2</sup> L 4) S cm<sup>2</sup> mol<sup>-3/2</sup> L<sup>-1/2</sup>

 Given below are the two statements.
 Statement I: Complete hydrolysis of DNA yields a pentose sugar, phosphoric acid and nitrogen containing heterocyclic compounds.

**Statement II:** In DNA molecule, the sugar molety is  $\beta$ -D-(-)-fructofuranose.

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

- 1) Both statement I and statement II are correct
- 2) Both statement I and statement II are incorrect
- 3) Statement | is correct but statement II is incorrect
- 4) Statement | is incorrect but statement II is correct
- 67. Match the List-I with List-II.

	List-I		List-II
Α.	$PCI_5 (g) \Longrightarrow PCI_3(g) +$	(i)	$\Delta H > \Delta U$
	Cl <sub>2</sub> (g)		
	-		
В.	$2HI(g) \Longrightarrow H_2(g) + I_2(g)$	(ii)	$\Delta H = \Delta U - RT$
C.	N <sub>2</sub> (g) + 3H <mark>2(g) = 2NH<sub>3</sub>(g)</mark>	(iii)	$\Delta H = \Delta U \neq 0$
D.	2CO <mark>(g) + O<sub>2</sub>(g) === 2CO<sub>2</sub>(g)</mark>	(iv)	$\Delta H = \Delta U - 2RT$

Choose the correct answers from the options given below.

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

68. Number of compounds/species from the following with non-zero dipole moment is

BeCl<sub>2</sub>, BCl<sub>3</sub>, NF<sub>3</sub>, XeF<sub>4</sub>, CCl<sub>4</sub>, H<sub>2</sub>O H<sub>2</sub>S, HBr, CO<sub>2</sub>, H<sub>2</sub>, HCl

- 1) 4 2) 5 3) 6 4) 7
- 69. The compound which reacts at fastest rate with aqueous AgNO<sub>3</sub> solution is



70. The shortest wavelength transition in the Paschen series in hydrogen atom occurs at 821 nm. At what wavelength does it occur in Li<sup>2+</sup>?

- 1) 91.2 nm 2) 273.6 nm
- 3) 822.0 nm 4) 7389.0 nm

71. Consider the following reaction sequence



Major product B is



- 72. A certain current liberates 0.500 g of  $H_2$  in 2.00 hr. How many gram of oxygen can be liberated by the same current in the same time?
  - 1) 0.500 g 2) 8.00 g
  - 3) 4.00 g (4) 16.00 g
- 73. The compound which reacts fastest with ZnCl<sub>2</sub> and conc. HCl is



74. Match List I with List II.

	List-l		List-II	
Α.	16 g of CH <sub>4</sub> (g )	(i)	Weighs 32 g	
В.	1g of H <sub>2</sub> (g)	(ii)	60.2 × 10 <sup>23</sup>	
		-	electrons	
C.	1 mole of O <sub>2</sub> (g )	(iii)	Weighs 64 g	
D.	1 mol of SO <sub>2</sub> (g )	(iv)	Occupies 11.4 L	
			volume at STP	

Choose the correct answers from the options given below.

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



76. For the reaction,  $2SO_2(g) + O_2(g) \rightleftharpoons 2SO_3(g)$ ,  $\Delta H = -57.2 \text{ kJ mol}^{-1} \text{ and } K_C = 1.7 \times 10^{16}$ 

Which of the following statements is incorrect?

- I. The equilibrium will shift in forward direction as the pressure increases.
- II. The addition of inert gas at constant volume will not affect the equilibrium constant.
- III. The equilibrium constant is large suggestive of reaction going to completion and so no catalyst is required.
- IV. The equilibrium constant decreases as the temperature increases.
- V. The equilibrium will shift in backward direction as the pressure increases.

Choose the correct option.

- 1) I, II, III and IV 2) I, II and IV
- 3) II, IV and V 4) III and V
- 77. Given below are two statements one is labelled as Assertion (A) other is labelled as Reason (R).
  Assertion (A): During nitration of aniline, significant amount of meta derivative is formed.
  Reason (R): In strongly acidic medium, aniline is protonated to form the anilinium ion which is meta directing.

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

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

- 78. The shape of Fe(CO)<sub>5</sub> is
  - 1) Trigonalbipyramidal
  - 2) Squareplanar
  - 3) Octahedray
  - 4) Squarepyramidal
- 79. Identify the incorrect statement
  - (a) The transition metals and their compounds are known for their catalytic activity due to their ability to adopt multiple oxidation states and to form complexes
  - (b) Interstitial compounds are those that are formed when small atoms like H, C or N are trapped inside the crystal lattices of metals
  - (c) The oxidation states of chromium in  $CrO_4^{2-}$ and  $Cr_2O_7^{2-}$  are not the same
  - (d)  $Cr^{2+}$  (d<sup>4</sup>) is a stronger reducing agent than  $Fe^{2+}$  (d<sup>6</sup>) in water
  - (e) The ionisation enthalpies of the early
  - Iathanoids are lower than for the early actinoids.

choose the correct option.

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

80. Given below are two statements.

**Statement I** pH of pure water is less than 7 at 60°C.

**Statement II** Ionisation of water into H<sup>+</sup> and OH<sup>-</sup> is an endothermic process.

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

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

Xe

(ii) C<sub>2</sub>H<sub>6</sub>O

81. Which of the following noble gas has unusual property of diffusing through glass, rubber or plastic

- 1) Ne 2) He
- 3) Ar <u>4)</u>
- 82. Which of the following will not show metamerism?
  - (i)  $C_4H_{10}O$

(iii)  $C_3H_8O$  (iv)  $C_5H_{12}$ 

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

- 83. Consider the following statements.
  - (a) There are infinite number of conformations of ethane.
  - (b) The repulsive interaction between the electron clouds, which affects stability of a conformation, is called torsional strain.
  - (c) In ethane, magnitude of torsional strain depends upon the angle of rotation about C C bond.

The correct statements are

- 1) (a) and (b) only 2) (b) and (c) only
- 3) (a) and (c) only 4) (a), (b) and (c)
- 84. Match List I with List II.

	List-l		List-II
Α.	Pt Fe <sup>3+</sup>  Fe <sup>2+</sup>	(i)	Metal sparingly soluble salt half-cell
В.	Pt H₂ H⁺	(ii)	Oxidation reduction half-cell
C.	Pt  Hg  Hg <sub>2</sub> <sup>2+</sup>	(iii)	Gas-gas ion half-cell
D.	Pb  PbSO <sub>4</sub>   SO <sub>4</sub> <sup>2-</sup>	(iv)	Metal-metal ion half-cell

Choose the correct answers from the options given below.

- 1) A (i), B (ii), C (iii), D (iv)
- 2) A (ii), B (iii), C (iv), D (i)
- 3) A (ii), B (iii), C (i), D (iv)
- 4) A (ii), B (i). C (iii), D (iv)
- 14

85. Resorcinol and guinol respectively are



- 86. A first order reaction was commenced with 0.2 M solution of the reactants. If the molarity of the solution falls to 0.02 M after 100 minutes the rate constant of the reaction is
  - $2 \times 10^{-2} \text{ sec}^{-1}$ 2)  $2.3 \times 10^{-2} \text{ sec}^{-1}$ 1) 3)
  - $4.6 \times 10^{-2} \text{ sec}^{-1}$  4)  $3.8 \times 10^{-4} \text{ sec}^{-1}$
- 87. The electronic configuration for Neodymium
  - $[Xe]4f^46s^2$  $[Xe]5f^47s^2$ 1) 2)
  - $[Xe]4f^{6}6s^{2}$ [Xe]4f<sup>1</sup>5d<sup>1</sup>6s<sup>2</sup> 3) 4)

88. Match column - I with column - II

	Column – I		Column – II
	(Element)		$\left(\Delta_{eg}H\right)$
I)	Oxygen	A)	– 349 KJ/mole
II)	Fluorine	B)	–141 KJ/mole
III)	Chlorine	C)	–200 KJ/mole
IV)	Sulphur	D)	–333 KJ/mole

Correct match is

ii.

- 1) (I) D, (II) B, (III) A, (IV) C
- 2) (I) C, (II) D, (III) A, (IV) B
- 3) (I) B, (II) D, (III) A, (IV) C
- 4) (I) - B, (II) - A, (III) - D, (IV) - C
- 89. A : Acidic strength of  $BCI_3 > AICI_3 > GaCI_3$ B : Boron does not exhibit allotropy C : Order of catenation : C >> Si > Ge > Sn  $\approx$  Pb D : Stability :  $GeX_4 > GeX_2$ Incorrect statement is
  - B & C 1) 2) A&D 3) B&D 4) A, B & C
- 90. Assertion (A) The total energy of two molecular orbitals, however, remains the same as that of two original atomic orbitals.

**Reason** (R) The energy of the antibonding orbital is raised above the energy of the parent atomic orbitals that have combined and the energy of the bonding orbital has been lowered than the parent orbitals.

- Both (A) and (R) are correct; (R) is the 1) correct explanation of (A).
- 2) Both (A) and (R) are correct; (R) is not the correct explanation of (A).
- 3) (A) is correct; (R) is incorrect.
- 3) (A) is incorrect; (R) is correct.

91. Which one of the followings matches is correct?

1)	Mucor	Reproduction	Ascomycetes
		by Conjugation	
2)	Agaricus	Parasitic fungus	Basidiomycetes
3)	Neurospora	Aseptate	Basidiomycetes
		mycelium	
4)	Alternaria	Sexual	Deuteromycetes
		reproduction	
		absent	

92. The given agent is a parasite which attacks the host. Host belong to which taxon



- 1) Plantae 2) 3) Fungi 4)
- Monera Animalia
- 93. Branched stem is found in
  - 1) Cycas and Pinus
  - 2) Cycas and Cedrus
  - 3) Pinus and Cedrus
  - 4) Cycas only

- 94. The correct sequence of the ploidy in moss protonemal cell, primary endosperm nucleus in dicots, rhizoid cell of a moss, prothallus cell of a fern, gemma cell in Marchantia, anther wall cell of monocot, ovum of liverwort, and zygote of fern
  - 1) N, 3N, N, N, N, 2N, N, 2N
  - 2) 3N, 2N, N, N, N, 2N, N, N
  - 3) 2N, 3N, 2N, N, N, N, N, N
  - 4) N, 3N, N, N, N, N, N, 2N
- 95. Free carpels are seen in :
  - 1) Lotus and rose
  - 2) Primrose and rose
  - 3) Lotus ad Argemone
  - 4) Dianthus and primrose.
- 96. Alternate phyllotaxy with pulvinate leafbase is seen in leaves of:
  - 1) Chinarose, Mustard
  - 2) Gram, Soyabean
  - 3) Petunia, Mustard
  - 4) Calotropis, Guava
- 97. Read the following statements and select the correct option.

**Statement I:** Trichomes in the shoot system are usually multicellular.

**Statement II:** Trichomes may be secretory or absorptive.

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



- 98. Which of these cells control the rolling & unrolling of leaves in monocots?
  - 1) albuminous cells
  - 2) isobilateral chlorenchyma
  - 3) bulliform cells
  - 4) pyriform cells
- 99. If an Animal cell lacks the cell organelle which has cartwheel structure, the cell will fail ...
  - 1) to synthesize ribosomal RNA
  - 2) to assimilate CO<sub>2</sub>
  - 3) to divide
  - 4) to synthesise lipids & glycolipids
- 100. Arrange the following organisms with increasing size. Organisms given are...
  - a) blue green alga b) viruses
  - c) bacteria d) viroids
  - 1)  $b \rightarrow d \rightarrow c \rightarrow a$
  - 2)  $c \rightarrow b \rightarrow d \rightarrow a$
  - 3)  $d \rightarrow b \rightarrow c \rightarrow a$
  - 4)  $a \rightarrow d \rightarrow b \rightarrow c$
- 101. A microspore of on Angiosperm has 4 chromosomes. What is the DNA content in G<sub>1</sub>
  - phase? 1) 4 2) 8 3) 16 4) 32

- 102. Which of these processes occurs during crossing over in meiosis ?
  - 1) Synapsis
  - 2) exchange of genetic material only
  - synapsis and exchange of genetic material only
  - 4) translocation of genetic material
- 103. Photosystem I (PS-I) and Photosystem-II (PS-II) are named
  - 1) in the sequence they work in light reaction
  - 2) according to their molecular weight
  - 3) in the sequence of their discovery
  - 4) in the sequence of flow of electrons
- 104. Who demonstrated that photosynthesis is essentially a light dependent reaction in which hydrogen from a suitable oxidisable compound reduces carbondioxide to carbohydrates.
  - 1) Priestley
  - 2) Igenhousz
  - 3) Cornelius Van Neils
  - 4) Arnon
- 105. Ubiquinone in mitochondrial ETS receives electrons or reducing equivalents from complex.
  - 1) I 2) II 3) I and II 4) I and III
- 17

- 106. The exponential growth can be expressed as  $W_1 = W_0 e^{rt}$ . What is 'r' in the expression?
  - (i) Relative growth rate and depends on final size.
  - (ii) Absolute growth rate and depends on initial size
  - (iii) Relative growth and also referred to as efficiency index.
  - (iv) The measure of the ability of the plant to produce new plant material.
  - 1) (i), (ii) only 2) (iii), (iv) only
  - 3) (iii) only 4) (ii), (iii), (iv) only
- 107. Given below are two statements: one is labelled as Assertion A and the other is labelled as Reason R.

**Assertion (A):** Auxins help to prevent fruits and leaves drop at early stages.

**Reason (R):** Auxins promote the abscission of older mature leaves and fruits.

- 1) Both (A) and (R) are correct and (R) is the correct explanation of (A).
- 2) Both (A) and (R) are correct but (R) is not the correct explanation of (A).
- 3) A is false but R is true
- 4) A is true but R is false.
- 108. In oxidative decarboxylation of pyruvic acid, metallic ion needed is
  - 1)  $Mn^{2+}$  2)  $Mg^{2+}$
  - 3) Ca<sup>2+</sup> 4) Fe<sup>2+</sup>

- 109. The oldest viable seed is of:
  - 1) lupine 2) Ficus
  - 3) date palm 4) phoenix
- 110. Identify A to E in the following diagram.
  - A- Tapetum,
     B- Microspore mother cell,
     C- Middle layer,
     D- Endothecium, E-

Epidermis

A- Epidermis,

2)



- B- Middle layer, C- Microspore mother cell,
  - D- Tapetum, E- Endothecium
- 3) A- Middle layer, B- Epidermis,
  - C- Tapetum, D- Microspore mother cell, E- Endothecium
- 4) 💁 Epidermis, B- Endothecium,
  - C- Middle layer, D- Microspore mother cell, E- Tapetum
- 111. A dicotyledonous plant bears flowers but never produces fruits and seeds. The most probable cause for the above situation is:
  - 1) plant is dioecious and bears only pistillate flowers
  - 2) plant is dioecious and bears both pistillate and staminate flowers
  - 3) plant is monoecious
  - 4) plant is dioecious and bears only staminate flowers



- 112. Which of the following is not true regarding sickle cell anaemia?
  - 1) Change in the amino acid at Sixth position of  $\beta$  -chain
  - 2) Change of codon GUG to GAG
  - 3) Valine, replacing glutamic acid
  - 4) Polymerisation of Haemoglobin under low oxygen tension
- 113. In this given pedigree what is the mode of inheritance



- 1) Autosomal dominant only
- 2) Autosomal recessive only
- X-linked dominant or autosomal recessive
- X-linked recessive or autosomal recessive
- 114. Choose the mismatched pair.
  - 1) Monosomy of sex chromosome: Turner's syndrome
  - 2) Autosome linked recessive disease : sickle cell anaemia
  - 3) Polyploidy: kleinfelter's syndrome
  - autosomal dominant disease : Myotonic dystrophy

115. Which of the following is a correct point showing difference between disc floret and ray floret of sunflower.

	Disc floret	Ray floret	
1)	Inferior ovary	Superior ovary	
2)	Actinomorphic	Asymmetrical	
3)	Actinomorphic	Zygomorphic	
4)	Bicarpellary	monocarpellary	

- 116. In the linear equation of growth  $L_t = L_0 + r_t$ , what is 'r'?
  - 1) radius of stem
  - 2) elongation per unit time
  - 3) increase in volume per unit time
  - 4) number of cells formed per unit time
- 117. Given below are the steps of process of recombinant DNA technology in its correct order except one step which is non relevant to the process. Identify this non relevant step.
  - A. Isolation of the genetic material
  - B. Cutting of DNA at specific location
  - C. Amplification of gene of interest using PCR
  - D. Addition of complementary probe.
  - E. Ligation of foreign gene into vector DNA
  - F. Insertion of recombinant DNA into host cell / organisms.
  - 1) B 2) C
  - 3) D 4) E



- 118. In a terrestrial ecosystem, major producers are:
  - 1) herbaceous and woody plants
  - 2) herbaceous plants and shrubs
  - 3) herbaceous plants only
  - 4) woody plants only
- 119. In a plant Red colour of flower is incompletely dominant to white colour while tallness is completely dominant to dwarfness. Find the phenotypic ratio in F<sub>2</sub> generation if homozygous tall red is crossed to Dwarf white plant.
  - 1) 9:3:1:1:1:3 2) 1:3:1:1:1:3
  - 3) 3:6:3:1:2:1 4) 9:3:4
- 120. Calyx of cruciferae has
  - 1) 4 sepals, polysepalous
  - 2) 5 sepals, polysepalous
  - 3) 4 sepals, gamosepalous
  - 4) 5 sepals, gamosepalous
- 121. Which of these scientists explained for the 1<sup>st</sup> time Mendel's laws by using the movement of chromosomes ?
  - 1) Walter Sutton & Theodore Boveri
  - 2) de Vries, Correns & von Tschermak
  - 3) Morgan
  - 4) Taylor

- 122. Perisperm is \_\_\_\_ and its ploidy is \_\_\_\_.
  - 1) Persistent nucellus, n
  - 2) persistent nucellus, 2n
  - 3) protective covering of endosperm, 3n
  - 4) covering around embryo-sac, n
- 123. The gross number of ATPs produced in aerobic respiration from one glucose molecule but without involving break-down of proton gradient is
  - 1)
     6
     2)
     24

     3)
     34
     4)
     12
- 124. The gaseous PGR is
  - 1) Ethylene and is largely promotor in growth activities
  - 2) Zeatin and is largely inhibitory in growth activities
  - Gethylene and largely an inhibitor in growth activities
  - GA and is largely inhibitory in growth activities
- 125. Cell wall of plants other than algae consists of :
  - 1) Cellulose, hemicellulose, pectins only
  - 2) hemicellulose, cellulose, mannans and lignin
  - 3) lignin, hemicellulose, pectin and galactans
  - 4) Proteins, hemicellulose, pectin and cellulose



- 126. Cell wall of Monera is composed of :
  - Fatty acids ad proteins 1)
  - 2) Polysaccharides and amino acids
  - 3) Fatty acids and Polysaccharides
  - 4) Cellulose and amino acids
- 127. A. All Gymnosperms are heterosporous
  - В. Bryophytes have well developed vessels and sieve tubes
  - C. Strobilus is found on the main plant body of Equisetum
  - D. Antheridia are absent but archaegonia are present in Gymnosperms.

Select the correct statements.

- 1) A, D only 2) A, C and D
- 3) A, B, C only 4) C and D only
- 128. T.S. of ovary of angiosperm reveals that the original one chambered ovary is divided into 2 chambers due to the formation of false septum. The section under observation might be taken from the ovary of ....
  - mustard 2) Dianthus 1) 3)
    - lemon 4) Primrose
- 129. In presence of which of these ions, recombinant DNA is taken up by bacterial cell more easily?
  - 1) potassium ions 2) calcium ions
  - chloride ions Phosphate ions 3) 4)

- 130. The RER in the cell synthesises proteins which would be later used in building the plasma membrane. But it is observed that the protein in the membrane is slightly different from the protein made in the RER. Identify the organelle/s that may have caused the change.
  - **Ribosomes and Golgi apparatus** 1)
  - 2) Cisternae of Golgi apparatus
  - Cisternae and vesicles of Golgi apparatus 3)
  - Golgi apparatus and lysosome 4)
- 131. Which of these phase is used to study the morphology of chromosomes under compound microscope?
  - 1) late prophase 2) metaphase
  - 3) anaphase 4) telophase
- 132. In photosynthesis, for formation of a molecule of glucose, the requirement of ATP and NADPH is respectively
  - 12 and 18 1) 15 and 10 2)
  - 12 and 6 18 and 12 3) 4)
- 133. Arrange the following steps of glycolysis in correct order.
  - Α. 3 phosphoglyceric acid
  - Β. Glyceraldehyde – 3 Phosphate
  - C. 2 Phosphoglycerate
  - D. 1, 3 bisphosphoglyceric acid
  - 1) D, B, A, C 2) B, A, D, C
  - 3) B, D, A, C 4) C, A, D, B
- 21

- 134. Gene gun is suitable for ...
  - 1) introducing DNA into animal cell
  - 2) introduction of rDNA into plant cell
  - 3) DNA fingerprinting
  - 4) RNAi
- 135. In an embryo sac, the cells that degenerate after fertilization are:
  - 1) synergids and primary endosperm cell
  - 2) synergids and antipodals
  - 3) antipodals and primary endosperm cell
  - 4) egg and antipodals
- 136. Consider the specimens of potato, Brinjal, Petunia, lion and leopard. The above organisms together belong to how many species, genera and families are there ?

	Species	Genus	Family
1)	Five	Two	Two
2)	Five	Four	Тwo
3)	Five	Three	Two
4)	Four	Three	Three

- 137. Read the following statements:
  - a. This phylum consists of a small group of worm like marine animals
  - b. They are bilaterally symmetrical, triploblastic and coelomate animals
  - c. The body is cylindrical
  - d. Respiration takes place through gills

The above characters are seen in Phylum

- 1) Aschelminthes 2) Mollusca
- 3) Echinodermata 4) Hemichordata

- 138. Which of the following biological agents are used for species specific, narrow spectrum insecticidal applications?
  - 1) Adenoviruses
  - 2) Nucleopolyhedrosis viruses
  - 3) Retroviruses
  - 4) Trichoderma
- 139. In cockroach, Malpighian tubules are present at the junction of:
  - 1) foregut and midgut
  - 2) midgut and hindgut
  - 3) hindgut and foregut
  - 4) foregut and hindgut
- 140. In frog, diencephalon is:
  - 1) Paired and is a part of midbrain
  - 2) Paired and is a part of forebrain
  - 3) Unpaired and is a part of forebrain
  - 4) Unpaired and is a part of midbrain
- 141. Cytoplasmic composition in a cell is roughly represented by :
  - 1) cell organelles
  - 2) acid soluble pool
  - 3) acid insoluble pool
  - 4) acid soluble pool as well as acid insoluble pool

- 142. In human respiratory system, Trachea bifurcated at the level of \_\_\_\_
  - 1) 7th cervical vertebrae
  - 2) 1st thoracic vertebrae
  - 3) 5th thoracic vertebrae
  - 4) 1st lumbar vertebrae
- 143. Which of the following is not an example of coevolution of mutualists ?
  - 1) Orchid *Ophrys* and Bee
  - 2) Opuntia and Cactus eating moth
  - 3) Yucca and Yucca moth
  - 4) Wasp and Fig
- 144. Arrange the following steps in proper order which occur during the catalytic cycle of an enzyme action.
  - The active site of the enzyme, in close proximity of the substrate breaks the chemical bonds of the substrate and the new enzyme- product complex is formed.
  - b. The binding of the substrate induces the enzyme to alter its shape, fitting more tightly around the substrate.
  - c. The enzyme releases the products of the reaction and the free enzyme is ready to bind to another molecule of the substrate.
  - d. The substrate binds to the active site of the enzyme, fitting into the active site.
  - 1) a, b, c, d 2) d, a, b, c
  - 3) d, b, c, a 4) d, b, a, c

- 145. For frugivorous birds and mammals in tropical forest of different continents, the slope (Z) is found to be:
  - 1)
     0.1 0.2
     2)
     0.6 1.2

     3)
     1.15
     4)
     11.5
- 146. Choose an appropriate medical term to denote the condition in which the heart muscle is suddenly damaged by an inadequate blood supply.
  - 1) cardiac arrest
  - 2) Coronary Artery Disease
  - 3) Heart failure
  - 4) Heart attack
- 147. Which is an incorrectly matched pair?
  - 1) Muscular movements: jaws, limbs
  - 2) Ciliary Movement: Fallopian Tubes
  - Amoeboid movement: Leucocytes and Macrophages
  - 4) Flagellar movement: Trachea and Bronchii
- 148. Read the following statements and select the correct option.

**Statement I:** When the urine moves through the descending limb of Henle's loop it becomes concentrated and when it moves through the ascending limb it gets diluted.

**Statement II:** The descending limb is permeable to sodium ions, while the ascending limb is permeable to water.

- 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

- 149. Human urine is usually acidic. The probable cause is:
  - 1) plasma proteins that are excreted are acidic
  - 2) potassium and sodium exchange generates acidity
  - hydrogen ions are secreted into the filtrate
  - the sodium transporter exchanges one hydrogen ion for each sodium ion, in peritubular capillaries.
- 150. Read the following statements:
  - i. Actin filament is made of two 'F' actins helically wound to each other
  - Complex protein, tropomyosin is distributed at regular intervals on the troponin
  - iii. Cross bridge between myosin and actin is broken when a new ATP binds
  - iv. Globular head of Meromyosin consists of light Meromyosin (LMM)

Of the above given statements:

- 1) i, is correct
- 2) i, iii are correct
- 3) iii, iv are correct
- 4) ii and iv are correct

- 151. I. Short statured with small round head
  - II. Furrowed tongue and partially opened mouth
  - III. Palm is broad with characteristic palm crease
  - IV. Slow physical, psychomotor and mental development

These are the characters of chromosomal combination

- 1) 45 Autosomes + XY or xx
- 2) 44 Autosomes + XO
- 3) 44 Autosomes + XXY
- 4) 46 Autosomes + XX / XY
- 152. Na<sup>+</sup> K<sup>+</sup> pump in axolemma
  - I. Needs energy (ATP) to work
  - II. Transports 3Na<sup>+</sup> outwards for 2K<sup>+</sup> into the cell.
  - III. Works against a concentration gradient
  - IV. Generates action potential

Identify correct statement only

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

- 153. Catecholamines ....
  - increase strength of heart contraction, increase rate of respiration, decrease blood sugar level, decrease lipolysis & increase proteolysis
  - decrease rate of respiration, increase heart beat & strength, increase blood sugar level but decrease lipolysis & proteolysis
  - increase heartbeat, increase rate of respiration, increase blood sugar level, increase lipolysis & proteolysis
  - decrease heart rate, rate of respiration, blood sugar, lipolysis, proteolysis but increase strength of heart beat
- 154. All points regarding Parathyroid hormone (PTH) are correct except –
  - 1) PTH stimulates bone demineralisation
  - Pituitary stimulates secretion of PTH when Ca<sup>2+</sup> in blood is low
  - PTH increases Ca<sup>+2</sup> absorption from the digestive tract
  - PTH stimulates reabsorption of Ca<sup>+2</sup> by the renal tubules
- 155. Sperm comes in contact with \_\_\_\_\_ of the ovum and brings changes in the membrane, restricting the entry of other sperm cells.
  - 1) Corona radiata
  - 2) Zona pellucida
  - 3) Antrum
  - 4) Perivitelline space

- 156. \_\_\_\_\_ help is collection of the ovum after ovulation?
  - 1) infundibulum 2) fimbriae
  - 3) ampulla 4) isthmus

## 157. Match the column.

	Column I		Column II
Α.	FSH	l.	Prepare endometrism
			for implantation
Β.	LH	н.	Develops female
			secondary sexual
			characters
C.	Progesterone	III.	Ovulation
D.	Estrogen	IV.	Maturation of
	. 0.		Graafian follicle

- 1) A IV, B III, C I, IV II
- 2) A IV, B III, C II, IV I
- 3) A III, B IV, C II, IV I
- 4) A III, B IV, C I, IV II
- 158. Approach of Human Genome Project (HGP) focused on identifying all the genes that expressed as RNA is known as:
  - 1) Expressed sequence tags
  - 2) Sequence annotation
  - 3) Polymerase chain reaction
  - 4) Complementation

159.	Double helix model of DNA proposed by		162. When two or more organs perform a
	Watson and Crick was based on		common function by their interaction,
	1) X-ray diffraction data of Meischer		they together form organ system
	2) X-ray defraction data of Wilkins and		1) Physical only
	Franklin		2) Chemical only
	3) Semiconservative DNA replication data		3) Mutualistic
	of Messelson and stahl		4) Physical and/or Chemical
	4) X-ray diffraction data of Chargaff		
			163. Glucosamines and N-acetyl galactosamine
160.	In industrial Melanism phenomenon, after		are:
	industrialization.		1) amines to facilitate transport of nitrogen
	(i) white winged variety of moths was		2) chemically modified amines forming part
	(ii) white winged variety of meths get		of polypeptides
	melanised		3) chemically modified sugars and amino
	(iii) Lichens from industrial area disappeared		sugars acting as building blocks of some
	(iv) Dark winged variety of moths survived		polysaccharides which are complex in
			nature.
	1) (ii), (iii), (iv) 2) (i), (iii), (iv)		4) chemically modified sugars and amino
	3) (iii), (iv) 4) (i), (ii), (iii), (iv)		sugars incorporated into cellulose
161.	Match the column		<u>164. Study of the following reactions:</u>
	Column I		$C \varphi_1 \mu m \sigma_2 + H_2 O \rightarrow H_2 CO_3$
Α.	Loose cell aggregation	(I)	Aschelminthes $HCO_2^ HCO_2^-$
В.	Bilateral symmetry	(11)	Hemichordata
С.	Pseudocoelome	(111)	$A(nin)_{el}HCO_{3}^{-}$ + H <sup>+</sup> $\rightarrow$ H <sub>2</sub> CO <sub>3</sub>
D.	Closed circulation	(IV)	$P(inv)fettaCO_3 \rightarrow CO_2 + H_2O$
<u> </u>	1) A – I, B – II, C – IV, D – III		
	2) A – IV, B <mark>– III, C – I, D</mark> – II		Which of the above reactions, take place at
	3) A – IV, B – <mark>II, C – I</mark> , D – III		the alveoli of lungs?
	4) A – II, B – III, C – I, D – IV		1) (i), (ii) 2) (iii), (iv)
			3) (i), (iv) 4) (iv) only

- 165. What is the correct order of events occurring in blood clotting?
  - I. Conversion of fibrinogen to fibrin.
  - II. Formation of clot
  - III. Thrombokinase formation.
  - IV. Conversion of prothrombin to thrombin.
  - V. Cascade process Choose the correct option
  - 1) III, II, I. V and IV
  - 2) V, III, IV, I and II
  - 3) III, IV, V, I and II
  - 4) III, V, IV, I and II

## 166. Read the following statements.

- (i) Primers used in PCR are small chemically synthesised oligosaccharides.
- (ii) E. coli is closely related to Salmonella.
- (iii) Plasmid is extra chromosomal DNA in bacteria which can not replicate autonomously.
- (iv) The techniques of the genetic engineering overcome the limitation of traditional hybridisation procedures.

In these statements how many are correct?

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

- 167. Fascia of a muscle bundle is:
  - 1) Connective tissue with elastin fibres
  - 2) Collagenous connective tissue
  - 3) Areolar connective tissue
  - 4) Elastic cartilage
- 168. Given below are two statements: one is labelled as Assertion A and the other is labelled as Reason R.

**Assertion (A):** Arrival of an impulse at the axon terminal, stimulates the release of neurotransmitters in the synaptic cleft

**Reason (R):** These neurotransmitters are responsible for the opening of ion channels to generate new potential in synaptic cleft.

- 1) Both (A) and (R) are correct and (R) is the correct explanation of (A).
- 2) Both (A) and (R) are correct but (R) is not the correct explanation of (A).
- 3) A is false but R is true
- 4) A is true but R is false.
- 169. Significant reduction in Biochemical oxygen demand of effluent in sewage treatment takes place during \_\_\_\_ treatment.
  - 1) Primary
  - 2) Secondary only
  - 3) Primary and Secondary
  - 4) Tertiary only

170. Consider the following statements:

Statement I: Cervical caps and vaults are not cost effective as they cannot be reused. Statement II: Contraceptive efficiency of vaults and cervical caps can be increased by using

spermicidal creams along with these barriers. Select the correct option.

- 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
- 171. Given below are two statements: one is labelled as Assertion A and the other is labelled as Reason R.

**Assertion (A):** Menstruation does not occur during the intense period of lactation.

**Reason (R):** Chances of conception are higher after 1–2 months following parturition.

- 1) Both (A) and (R) are correct and (R) is the correct explanation of (A).
- 2) Both (A) and (R) are correct but (R) is not the correct explanation of (A).
- 3) A is false but R is true
- 4) A is true but R is false.
- 172. Phosphoric acid remains associated with which of the following carbon of sugar of its own nucleotide?
  - 1) Ist 2) 3<sup>rd</sup>
  - 3) 4th 4) 5<sup>th</sup>

- 173. Mark the favourite theory of some astronomers about origin of life on earth.
  - 1) theory of spontaneous generation
  - 2) big bang theory
  - 3) panspermia theory
  - 4) theory of chemical evolution
- 174. Odd man out w.r.t. type of mammal.
  - 1) Bobcat
  - 2) Tasmanian tiger cat
  - 3) Spotted cuscus
  - 4) Numbat
- 175. Damage to thymus in a child may lead to
  - 1) Loss of cell mediated immunity
  - 2) Loss of cell mediated immunity and humoral immunity
  - Loss of cell mediated immunity but promotion of antibody mediated immunity / humoral immunity
  - 4) A reduction in stem cell production
- 176. In equation  $\log S = \log C + Z \log A$ , what is Z:
  - 1) Species richness
  - 2) Area
  - 3) Regression coefficient
  - 4) Y-intercept
- 177. The left ventricle pumps blood into \_(i)\_ which carries it to \_(ii)\_.
  - 1) (i) pulmonary trunk, (ii) lungs
  - (i) systemic aorta,
     (ii) all body parts
  - 3) (i) systemic aorta, (ii) lungs
  - 4) (i) systemic aorta,(ii) all body parts except liver



- 178. Person suffered from snake bite is injected with.....
  - 1) preformed antigen-antibody complexes
  - 2) preformed antibodies
  - 3) heat treated inactive snake toxin
  - 4) colostrum
- 179. The regulator gene of a bacterial operon
  - 1) Codes for inducer substances
  - 2) Codes for repressor proteins
  - 3) Provides binding site for repressor
  - 4) Is a binding site for RNA polymerase

180. Different types of excretory structures and animals are given below. Match them appropriately and mark the correct answer from among those given below.

	Excretory Structure in Animals		Organ
Α.	Protonephridia		Prawn
В.	Nephridia		Cockroach
С.	Malpighian tubules	(111)	Earthworm
D.	Green gland	(IV)	Flatworms

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

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