Neet ENTRANCE EXAM - NEET-UG

Time Allowed: 3 hours

General Instructions:

- The test is of 3 hours and it contains 180 questions.
- For each correct response, the candidate will get 4 marks.
- For each incorrect response, one mark will be deducted from the total scores.
- The maximum marks are 720.

PHYSICS

- 1) Two waves are given by: $y_1 = \cos (4t 2x)$ and $y_2 = \sin (4t 2x + \frac{\pi}{4})$. The phase difference between the two wave is: [4]
 - a) $\frac{\pi}{2}$ c) $\frac{\pi}{4}$ b) $\frac{3\pi}{4}$ d) $-\frac{\pi}{4}$
- A closed organ pipe of length 20 cm is sounded with tuning fork in resonance. What is the frequency of tuning fork? (v = 332m/s) [4]

a)	350 Hz	b)	300 Hz
c)	375 Hz	d)	415 Hz

3) An organ pipe P closed at one end vibrates in its first harmonic. Another organ pipe Q open at both ends vibrates in its third harmonic. When both are in resonance with a tuning fork, the ratio of the length of P to that of Q is: [4]

a)	$\frac{1}{6}$	b)
c)	$\frac{1}{4}$	d)

4) The unit of self - inductance of a coil is [4]

a) Weber b) Henry

c) Tesla d) Farad

- 5) Surface tension has the same dimensions as that of: [4]
 - a) Impulse
 - b) Momentum
 - c) Coefficient of viscosity
 - d) Spring constant
- 6) The length, breadth and thickness of a block are given by l = 12 cm, h = 6 cm and t = 2.45 cm. The volume of the block according to the idea of significant figures should be: [4]

a)	$1 \times$	10^2 cm^3	b)	$1.763 \times$	10^2 cm^3
c)	$2 \times$	$10^2 {\rm cm}^3$	d)	3×10^{2}	2 cm ³

7) A mass is suspended separately by two springs of spring constants k_1 and k_2 in successive order. The time periods of oscillations in the two cases are T_1 and T_2 respectively. If the same mass be suspended by connecting two springs in parallel (as shown in figure), then the time period of the oscillation is T. The correct relation is:

[4]
a)
$$T^{-1} = T_1^{-1} + T_2^{-1}$$

b) $T^{-2} = T_1^{-2} + T_2^{-2}$

c) $T^2 = T_1^2 + T_2^2$ d) $T = T_1 + T_2$

- The differential equation of a particle executing simple harmonic motion along y - axis is: [4]
 - a) $\frac{d^2y}{dt^2} + \omega^2 y = 0$ b) $\frac{d^2y}{dt^2} - \omega^2 y = 0$ c) $\frac{dy}{dt} + \omega y = 0$ d) $\frac{d^2y}{dt^2} + \omega^2 y^2 = 0$
- 9) A ball is thrown vertically downward with a velocity of 20 m/s from the top of a tower. It hits the ground after some time with a velocity of 80 m/s. The height of the tower is: $(g = 10 \text{ m/s}^2)$ [4]
 - a) 360 m c) 340 m d) 320 m
- 10) A ball is dropped on the floor from a height of 10 m. It rebounds to a height of 2.5 m. If the ball is in contact with the floor for 0.01 sec, the average acceleration during contact is: [4]
 - a) $1400 \frac{\text{m}}{\text{sec}^2}$ b) $2100 \frac{\text{m}}{\text{sec}^2}$ upwards c) $700 \frac{\text{m}}{\text{sec}^2}$
 - d) $2100 \frac{\text{m}}{\text{sec}^2}$ downwards
- The temperature of 5 mole of a gas which was held at constant volume was changed from 100°C to 120°C. The change in internal energy was found to be 80 J. The total heat capacity of the gas at constant volume will be equal to: [4]
 - a) $0.8 J K^{-1}$ b) $0.4 J K^{-1}$ c) $8 J K^{-1}$ d) $4 J K^{-1}$
- A perfect gas at 27°C is heated at constant pressure to 327°C. If original volume of gas at 27°C is V then volume at 327°C is: [4]
 - a) 3Vc) 2Vb) Vd) $\frac{V}{2}$
- 13) When an object is shot from the bottom of a long smooth inclined plane kept at an angle 60° with horizontal, it can travel a distance x_1 along the plane. But when the inclination is decreased to 30° and the same object is shot with the same velocity, it can travel x_2 distance. Then $x_1 : x_2$ will be: [4]
 - a) $1:\sqrt{3}$ b) $\sqrt{2}: 1$ c) $1: 2:\sqrt{3}$ d) $1:\sqrt{2}$
- 14) A balloon with mass m is descending down with an acceleration a (where a < g). How much mass should be removed from it so that is starts moving up with an acceleration a? [4]

Maximum Marks : 720

a)	$\frac{2ma}{g+a}$	b)	$\frac{ma}{g+a}$
c)	$\frac{2ma}{a-a}$	d)	$\frac{ma}{a-a}$

15) A reversible engine and an irreversible engine are operating between the same temperatures. The efficiency of: [4]

+a

-a

- a) Both the engines will be 100%
- b) Reversible engine will be greater
- c) Reversible engine will be 100%
- d) Irreversible engine will be greater
- 16) One mole of an ideal gas at an initial temperature of TK does 6R joules of work adiabatically. If the ratio of specific heats of this gas at constant pressure and at constant volume is $\frac{5}{3}$, the final temperature (T_f) of gas will be: [4]
 - b) (T 2.4)K a) (T + 4)K
 - d) (T 4)K c) (T + 2.4)K
- 17) If the degrees of freedom of a gas molecule be f then the ratio of two specific heats C_p/C_v is given by: [4]

a)	$1 + \frac{1}{f}$	b)	$1 - \frac{2}{f}$	
c)	$1 - \frac{1}{f}$	d)	$\frac{2}{f} + 1$	

- 18) One man takes 1 minute to raise a box to a height of 1 metre and another man takes $\frac{1}{2}$ minute to do so. The energy of the two is:
 - i. Different
 - ii. Same
 - iii. Energy of the first is more
 - iv. Energy of the second is more
 - [4]
 - b) I and ii a) Iv and i c) Only ii d) Iii and iv
- 19) Which of the following is not an inelastic collision?
 - i. A man jumps on a cart
 - ii. A bullet embedded in a block
 - iii. Collision of two glass balls
 - iv. None of these
 - [4]

a)	I and ii	b) Iv and i
c)	Ii and iii	d) Only iii

20) The force F acting on a particle of mass m is indicated by the force - time graph shown below. The change in momentum of the particle over the time interval from zero to 8 s is:

[4]			
a)	12 Ns	b)	6 Ns
c)	20 Ns	d)	24 N

- 21) A particle of mass m_1 is moving with a velocity v_1 and another particle of mass m₂ is moving with a velocity v2. Both of them have the same momentum but their different kinetic energies are E1 and E2 respectively. If $m_1 > m_2$, then: [4]
 - a) $\frac{E_1}{E_2} = \frac{m_1}{m_2}$ b) $E_1 > E_2$ c) $E_1 < E_2$ d) $E_1 = E_2$
- 22) At 0°C, the densities of a cork and a liquid in which the cork floats are d₁and d₂ respectively. The coefficients of expansion for the material of the cork and the liquid are

 γ and 100 γ respectively. If the cork sinks when the temperature of the liquid is $t^{o}C$, then ratio (d_{2}/d_{1}) is: [4]

a)
$$\frac{1 + \gamma t}{100 + \gamma t}$$

b)
$$\frac{100 + \gamma t}{1 + \gamma t}$$

c)
$$\frac{1 + \gamma t}{1 + 100\gamma t}$$

d)
$$\frac{1 + 100\gamma t}{1 + \gamma t}$$

23) When the temperature of a rod increases from t to t $+\Delta$ t, its moment of inertia increases from I to I + Δ I. If α be the coefficient of linear expansion of the rod, then the value of $\frac{\Delta I}{I}$ is: [4]

a)
$$\frac{\Delta t}{\alpha}$$

b) $\frac{\alpha \Delta t}{2}$
c) $\alpha \Delta t$
d) $2\alpha \Delta t$

- 24) A capillary tube of radius r is immersed in water and water rises in it to a height h. The mass of water in the capillary tube is 5g. Another capillary tube of radius 2r is immersed in water. The mass of water that will rise in this tube is: [4]
 - a) 5.0g c)

10g

- b) 2.5g d) 20g
- 25) A cylindrical vessel of 90 cm height is kept filled upto the brim. It has four holes 1, 2, 3, 4 which are respectively at heights of 20 cm, 30 cm, 45 cm and 50 cm from the horizontal floor PO. The water falling at the maximum horizontal distance from the vessel comes from:

- Hole number 3 b) Hole number 2 a) c)
 - Hole number 4 d) Hole number 1
- 26) If distance between the earth and the sun become four times, then time period becomes: [4]

a)	$\frac{1}{8}$	times	b)	8 times
c)	$\frac{1}{4}$	times	d)	4 times

Q

- 27) At surface of Earth weight of a person is 72 N then his weight at height $\frac{R}{2}$ from surface of Earth is (R = radius of earth): [4]
 - b) 72 N a) 16 N c) 32 N d) 28 N
- 28) A geostationary satellite is orbiting the earth at a height of 5R above the surface of the earth, R being the radius of the earth. The time period of another satellite in hours at a height of 2R from the surface of the earth is: [4] a) 10 b) 5 $\frac{6}{\sqrt{2}}$ d) $6\sqrt{2}$ c)
- 29) From a disc of radius R and mass M, a circular hole of diameter R, whose rim passes through the centre is cut. What is the moment of inertia of the remaining part of the disc about a perpendicular axis, passing through the centre? [4] 11 MD2/22

30) Three identical spherical shells, each of mass M and radius rare placed as shown in figure. Consider an axis XX' which is touching to low shells and passing through diameter of third shell. Moment of inertia of the system consisting of these spherical shells about XX' axis is:



31) A solid cylinder of mass 3 kg is rolling on a horizontal surface with velocity 4 ms⁻¹. It collides with horizontal spring of force constant 200 Nm⁻¹. The maximum compression produced in the spring will be: [4] a) 0.5 m b) 0.6 m

b) $\frac{16}{5}Mr^2$ d) $3MR^2$

- c) 0.2 m d) 0.7 m
- 32) A rubber cord catapult has cross sectional area 25 mm² and initial length of rubber cord is 10 cm, It is stretched to 5 cm and then released to project a missile of mass 5 gm. Taking $\gamma_{rubber} = 5 \times 10^8$ N/m² velocity of projected missile is: [4]

a)	200 m/s	b)	100 m/s
c)	20 m/s	d)	250 m/s

- 33) The power of sound from the speaker of the radio is 20 mW. By tunning the knob of volume control the power of sound is increased to 400 mW. What is the power increase as compared to the original power? [4]
 - a) 1.3 dB b) 3.1 dB c) 30.1 dB d) 13 dB
- 34) A wave is represented by the equation: $y = 7 \sin (7\pi t 0.04x + \frac{\pi}{3}$). Where, s is in metres and t in seconds.

The speed of the waves is: [4]

a)	$(49\pi$) m/s	b)	$(175\pi) m/$
c)	$(0.28\pi$) m/s	d)	$(\frac{49}{\pi})$ m/s

- 35) There are three sources of the sound of equal intensity with frequencies 400, 401 and 402 vibrations/sec. The number of beats heard per second is: [4] a) 2 b) 0 c) 1 d) 3
- 36) The ratio of kinetic energy at mean position to the potential energy when the displacement is half of the amplitude is: [4] a) <u></u>43

	b
	ď

37) Two simple harmonic motions of angular frequency 100 and 1000 rad s⁻¹ have the same displacement amplitude. The ratio of their maximum acceleration is: [4] a) $1 : 10^4$ b) $1 : 10^2$ c)

) 1	:	10
) 1) 1:

38) In the given (V - T) diagram, what is the relation between pressure P_1 and P_2 ?



c)

c)

a) $P_2 = P_1$ b) $P_2 > P_1$ $P_2 < P_1$ d) Cannot be predicted

39) The molecules of a given mass of a gas have r.m.s.

velocity of 200 ms $^{-1}$ at 27°C and 1.0 \times 10 5 Nm $^{-2}$ pressure. When the temperature and pressure of the gas are respectively, 127°C and 0.05 \times 10⁵ Nm⁻², the r.m.s. velocity of its molecules in ms⁻¹ is: [4]

- a) $100\sqrt{2}$ b) <u>400</u> $\sqrt{3}$ c) $\frac{100\sqrt{2}}{2}$ d) $\frac{100}{2}$
- 40) The distance travelled by a particle starting from rest and moving with an acceleration $\frac{4}{3}$ ms⁻², in the third second is: [4]
 - a) 4 m b) $\frac{10}{3}$ m c) 6 m d) $\frac{19}{3}$ m
- 41) If $\vec{A} = 2\hat{i} + 3\hat{j} \hat{k}$ and $\vec{B} = -\hat{i} + 3\hat{j} + 4\hat{k}$, then projection of \vec{A} on \vec{B} will be: [4]

a) $\sqrt{\frac{3}{26}}$ c) $\sqrt{\frac{3}{13}}$

- 42) Two vectors \vec{A} and \vec{B} are perpendicular to each other, then: [4]
 - a) $\vec{A} \times \vec{B} = 0$ b) $\vec{A} + \vec{B} = 0$ c) $\vec{A} - \vec{B} = 0$ d) $\vec{A} \cdot \vec{B} = 0$
- 43) Two identical balls A and B having velocities of 0.5 m/s and - 0.3 m/s respectively collide elastically in one dimension. The velocities of B and A after the collision respectively will be: [4]
 - a) 0.3 m/s and 0.5 m/s b) 0.5 m/s and 0.3 m/s c) - 0.5 m/s and 0.3 m/s d) 0.3 m/s and 0.5 m/s
- 44) Water falls from a height of 60 m at the ratio of 15 kg/s to operate a turbine. The losses due to frictional forces are 10% of energy. How much power is generated by the turbine? $(g = 10m/s^2)$ [4]
 - a) 10.2 kW b) 8.1 kW
 - 7.0 kW d) 12.3 kW c)
- 45) The slope of the kinetic energy versus position vector gives the rate of change of: [4]
 - a) Work b) Force
 - c) Velocity d) Momentum

CHEMISTRY

- 46) Suppose the elements X and Y combine to form two compounds XY_2 and X_3Y_2 . When 0.1 mole of XY_2 weighs 10 g and 0.05 mole of weighs 9 g, the atomic weights of X and Y are: [4] a) 40, 30 b) 30, 20
 - c) 60, 40 d) 20, 30
- 47) What volume of oxygen gas (O_2) measured at $0^{\circ}C$ and 1 atm, is needed to bum completely 1L of propane gas (C_3H_8) measured under the same conditions? [4] 10 T b) 6 I

<i>a)</i>	10 L	0)	0	L
c)	5 L	d)	7	L

48) Haemoglobin contains 0.33% of iron by weight. The molecular weight of haemoglobin is approximately 67200 g. The number of iron atoms (at. weight of Fe is 56) present in one molecule of haemoglobin are: [4]

- a) 2 b) 5 d) - 3 c)
- 49) An element, X has the following isotopic composition: ^{200}X : 90% ^{199}X : 8.0% ^{202}X : 2.0% The average atomic mass of the naturally - occurring element X is closest to: [4] a) 200 amu b) 201 amu c) 199 amu d) 202 amu

4

- 50) The value of Planck's constant is 6.63×10^{-34} J s. The velocity of light is 3.0×10^8 ms⁻¹. Which value is closest to the wavelength in nanometre of a quantum of light with frequency of 8 \times $10^{15} s^{-1} ?$ [4] b) 5×10^{-18} a) 3×10^7 c) 2×10^{-25} d) 4×10^{-18}
- 51) If n = 6, the correct sequence for filling of electrons will be : [4]
 - a) Ns \rightarrow $(n - 2)f \rightarrow np \rightarrow (n -$ 1)d b) Ns \rightarrow np \rightarrow (n - 1)d \rightarrow (n -2)f c) Ns \rightarrow (n - 1)d \rightarrow (n - 2)f \rightarrow np d) Ns \rightarrow (n - 2)f \rightarrow (n - 1)d \rightarrow np
- 52) For azimuthal quantum number 1 = 3, the maximum number of electrons will be : [4] a) 14 6 b)
 - c) 2 d) Zero
- 53) The orbital angular momentum of a p electron is given as: [4]
 - a) b) $\sqrt{3}$ c) $\sqrt{6} \cdot \frac{h}{2a}$ d) $\sqrt{\frac{3}{2}\frac{h}{\pi}}$

c)

- 54) For the second period elements the correct increasing order of first ionisation enthalpy is: [4]
 - a) Li < B < Be < C < O < N < F < Neb) Li < Be < B < C < O < N < F < Nec) Li < Be < B < C < N < O < F < Ne d) Li < B < Be < C < N < O < F < Ne
- 55) The electronic configuration of four elements are given below. Which elements does not belong to the same family as others? [4] a) [Ar] $3d^{10} 4s^2$ b) [Ne] $3s^2$ $3p^5$

[AI]Ju	45	0)	[ne]ss sp	
[Kr]4d ¹⁰	5s ²	d)	[Xe]4f ¹⁴ 5d ¹⁰	$6s^2$

- 56) Which electronic configuration of an element has abnormally high difference between second and third ionization energy? [4]
 - a) $1s^2$, $2s^2$, $2p^6$, $3s^2$ b) $1s^2$, $2s^2$, $2p^6$, $3s^1$ $3p^1$ c) $1s^2$, $2s^2$, $2p^6$, $3s^1$ d) $1s^2$, $2s^2$, $2p^6$, $3s^2$ $3p^2$
- 57) Which one of the following arrangements represents the correct order of electron gain enthalpy (with negative sign) of the given atomic species? [4]

of the given atomic species.	[7]	
a) $O < S < F < Cl$	b)	S < O < Cl < F
c) $Cl < F < S < 0$	d)	F < Cl < O < S
Which of the followings is p	aram	agnetic? [4]

58) Which of the followings is paramagnetic? [4] b) CO a) NO⁺ c) O₂ d) CN⁻

- 59) According to molecular orbital theory which of the lists ranks the nitrogen species in terms of increasing bond order? [4]
 - a) $N_2^{2-} < N_2^- < N_2$ $\begin{array}{l} \text{b)} \quad N_2 < N_2^{2-} < N_2^{-} \\ \text{c)} \quad N_2^- < N_2^{2-} < N_2^{-} \\ \text{d)} \quad N_2^- < N_2 < N_2^{2-} \\ \end{array}$
- 60) The BCl₃ is a planar molecule whereas NCl₃ is pyramidal, because [4]
 - a) N CI bond is more covalent than B CI bond
 - b) BCl₃ has no lone pair but NCl₃ has a lone pair of electrons
 - c) Nitrogen atom is smaller than boron atoms
 - d) B CI bond is more polar than N CI bond
- 61) In which of the following pairs of molecules/ions, the central atoms have sp² hybridisation? [4]
 - a) NO_2^- and NH_3
 - b) BF_3 and $NO_2^$ c) NH_2^- and H_2O
 - d) BF3 and NH₂
- 62) Which one of the following formulae does not correctly represent the bonding capacities of the atoms involved? [4]

a)
b)

$$0 \leftarrow N$$

 $0 - H$
 $H - C = C$
 $0 - H$
 $H - C = C$
 $0 - H$
 $H - H = H^{+}$

63) For a reaction A \rightarrow B, enthalpy of reaction is - 4.2 kJ mol⁻¹ and enthalpy of activation is 9.6 kJ mol⁻¹. The correct potential energy profile for the reaction is shown in option. [4]



64) Bond dissociation enthalpy of	H ₂ ,	Cl ₂ and HCI are 434,
242 and 431 kJ mol ⁻¹ respec	tive	ly. Enthalpy of forma-
tion of HCl is: [4]		
a) - 245 kJ mol ⁻¹	b)	- 93 kJ mol ^{- 1}
c) 245 kJ mol ⁻¹	d)	93 kJ mol ^{- 1}
65) From the following bond energy	gies	

- H H bond energy: 431.37 kJ mol⁻¹ C = C bond energy: 606.10 kJ mol⁻¹ C - C bond energy: 336.49 kJ mol⁻¹ C - H bond energy: 410.50 kJ mol⁻¹ Enthalpy for the reaction, нн $c = c + H - H \longrightarrow H - C - C - H$ н н н will be: [4] a) 553.0 kJ mol - 1 b) - 120.0 kJ mol - 1 c) 1523.6 kJ mol⁻¹ d) - 243.6 kJ mol - 1
- 66) In which of the following reactions, standard reaction entropy change (Δ S°) is positive and standard Gibbs's energy change (Δ G°) decreases sharply with increasing temperature? [4]

a) C(graphite) + $\frac{1}{2}$ O₂(g) \rightarrow CO(g) b) CO(g) $+\frac{1}{2}$ O₂(g) \rightarrow CO₂(g) c) Mg(s) $+\frac{1}{2}$ O₂(g) \rightarrow MgO(s) d) $\frac{1}{2}$ C(graphite) $+\frac{1}{2}$ O₂(g) \rightarrow $\frac{1}{2}$ CO₂(g)

- 67) Which will make a basic buffer? [4]
 - a) 100 mL of 0.1 M CH₃COOH + 100 mL of 0.1 M NaOH
 - b) 50 mL of 0.1 M NaOH + 25 mL of 0.1 M CH₃COOH
 - c) 100 mL of 0.1 M HCl + 200 mL of 0.1 M NH₄OH
 - d) 100 mL of 0.1 M HCl + 100 mL of 0.1 M NaOH

68) In which of the	following	solutions	the	sol	ubility	of A	AgCl
will be maximu	ım? [4]						
a) 0.1 M Ag	NO ₃	b)	0.1	Μ	KC1		
c) 0.1 M Na	Cl	d)	Wat	ter			

- 69) At 80°C, distilled water has [H₃O⁺]concentration equal to 1 \times 10⁻⁶ mole/litre. The value of K_w at this temperature will be: [4] b) 1× 10 - 15 a) 1×10^{-6} c) 1×10^{-9} d) 1× 10⁻¹²
- 70) PH of 0.05 M Mg(OH)² is: [4] a) 10 b) Zero c) 13 d) 1
- 71) What is the pH of the resulting solution when equal volumes of 0.1 M NaOH and 0.01 M HCl are mixed? [4] 2.0 b) 7.0 a)

c)	1.04	d)	12.65
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72) A, B and C are three elements fonning a part of the compound in oxidation states of +2, +5 and - 2 respectively. What could be the compound? [4] $A_{2}(\mathbf{RC})$

a)	$A_3(BC_4)_2$	D)	$A_2(BC_4)_3$
c)	ABC	d)	$A_2(BC)_2$

73) In acidic medium, H_2O_2 changes $Cr_2O_7^{2-}$ to CrO_5 which has two (- O - O -) bonds. Oxidation state of Cr in CrO₅ is: [4] a) +3 b) - 10

~)		•)	10
c)	+6	d)	+5

74) Assuming complete ionization, same moles of which of

the following compounds will require the least amount of acidified $KMnO_4$ for complete oxidation: [4]

- a) FeSO₃ b) FeC_2O_4 c) FeSO₄ d) $Fe(SO_2)_2$
- 75) Name the gas that can readily decolourise acidified
- KMnO₄ solution: [4] SO_2 b)

a) P_2O_2 c) CO_2 d) NO_2

- 76) Which of the following oxidation states are the most characteristic for lead and tin respectively? [4]
 - a) +2, +2 b) +2, +4 d) +4, +4 c) +4, +2
- 77) Which compound is electron deficient? [4] a) BeCl₂ b) BCl₃ c) PCl₅ d) CCl₄
- 78) Which of the following anions is present in the chain structure of silicates? [4]
 - a) SiO_4^{4-} b) $(Si_2O_5^{2-})_n$ c) $Si_2O_7^6$
 - d) (SiO_3^2)
- 79) The stability of +1 oxidation state among Al, Ga, In and Tl increases in the sequence: [4]
 - b) TI < In < Ga < Ala) Al < Ga < In < Tl
 - c) Ga < In < Al < Tld) In < TI < Ga < Al
- 80) Which of the following reagents will be able to distinguish between 1 - butyne and 2 - butyne? [4]
 - a) HCI b) NaNH₂ c) Br₂ d) O_2
- 81) Which of the following compounds will not undergo Friedel - Craft's reaction easily? [4]
 - a) Nitrobenzene b) Cumene
 - c) Xylene d) Toluene
- 82) The dihedral angle between two C H bonds in the staggered conformation of ethane is [4] a) 0° b) 180°
 - c) 120° d) 60°
- 83) The major product formed in dehydrohalogenation reaction of 2 - Bromo pentane is Pent - 2 - ene. This product formation is based on [4]
 - a) Saytzeff's Rule b) Huckel's Rule
 - c) Hofmann Rule d) Hund's Rule
- 84) The species, having bond angles: [4] a) NCl₃ b) BCl₃
 - d) ClF₃ c) PH₃
- 85) PCI₃ reacts with water to form: [4] b) POCl₃ a) PH₃

d) H₃PO₃, HCl

- c) H₃PO₄
- 86) PH₄I + NaOH forms: [4] a) NH₃
 - b) P_4O_{10} c) PH₃ d) P₄O₆
- 87) The correct order regarding the electronegativity of hybrid orbitals of carbon is: [4]
 - b) Sp > sp^2 > sp^3 a) Sp < sp² < sp³ c) Sp < sp^2 > sp^3 d) Sp > $sp^2 < sp^3$
- 88) The stability of carbanions in the following:

i.
$$RC \equiv C$$

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ii.
$$R_2C = CH$$

iv.
$$R_3C - CH_2$$

is in the order of :
[4]

a) (ii) > (iii) > (iv) > (i) b) (iv) > (ii) > (iii)> (i) c) (i) > (ii) > (iii) > (iv) d) (i) > (iii) > (ii) > (iv)

- 89) Which one of the following compounds is resistant to nucleophilic attack by hydroxyl ions? [4]
 - b) Acetamide a) Methyl acetate c) Dimethyl ether d) Acetonitrile
- 90) Which of the following possesses a sp carbon in its structure?

i. $CH_2=CC1 - CH=CH_2$ ii. CH₂=C=CH₂ iii. $CCI_2 = CCI_2$ iv. CH₂=CH - CH=CH₂

- [4] Option B is correct b) Option D is correct a) Option C is correct Option A is correct c) d)

BOTANY

91)	Casp	arian strips occur in: [4]		
	a)	Endodermis	b)	Epidermis
	c)	Cortex	d)	Pericycle

- 92) Stomata in grass leaf are: [4]
 - a) Dumb bell shaped b) Barrel shaped

c) Kidney shaped d) Rectangular

- 93) In Kranz anatomy, the bundle sheath cells have: [4]
 - a) Thick walls, no intercellular spaces and large number of chloroplasts
 - b) Thick walls, many intercellular spaces and few chloroplasts
 - c) Thin walls, no intercellular spaces and several chloroplasts
 - d) Thin walls, many intercellular spaces and no chloroplasts
- 94) You are given a fairly old piece of dicot stem and a dicot root Which of the following anatomical structures will you use to distinguish between the two? [4]
 - a) Secondary xylem b) Protoxylem
 - Secondary phloem Cortical cells c) d)
- 95) Water vapour comes out from the plant leaf through the stomatal opening. Through the same stomatal opening, carbon dioxide diffuses into the plant during photosynthesis. Reason out the above statements using one of following options: [4]
 - a) One process occurs during day time and the other at night
 - b) Both processes cannot happen simultaneously
 - c) The above processes happen only during night time
 - d) Both processes can happen together because the diffusion coefficient of water and CO₂ is different
- 96) The correct sequence of cell organelles during photorespiration is: [4]

a) Chloroplast - Vacuole - Peroxisome

	 b) Chloroplast - Mitochonda c) Chloroplast - Rough Dictyosomes 	ria - Peroxisome endoplasmic reticulum -
	d) Chloroplast - Golgi bodi	es - Mitochondria
97)	If the total incident solar radia is: [4]	tion the proportion of PAR
	a) About 70% c) About 60%	b) Less than 50%d) More than 80%
98)	In a chloroplast, the highest min: [4]	umber of protons are found
	a) Antennae complexc) Lumen thylakoids	b) Inter membrane spaced) Stroma
99)	Phytochrome is a: [4]a) Glycoproteinc) Lipoprotein	b) Flavoproteind) Chromoprotein
100)	In light reaction, plastoquinon electrons from: [4]	e facilitates the transfer of
	 a) PS - II to Cytb₆f compl b) Cytb₆f complex to PS - c) PS - I to NADP⁺ 	ex I
	d) PS - I to ATP synthase	
101)	Which one of the following g as 'stress hormone'? [4] a) Indole acetic acid	growth regulators is known b) Abscisic acid
	c) Ethylene	d) GA ₃
102)	The plant hormone used to de a) NAA c) 2, 4 - D	estroy weeds in a field [4] b) IAA d) IBA
103)	In Glycine max, the product of is transported from the root n a) Ureides c) Ammonia	biological nitrogen fixation odules to other parts as [4]b) Nitratesd) Glutamate
104)	Fruit and leaf drop at early	stage can be prevented by
	a) Gibberellic acidc) Ethylene	b) Auxinsd) Cytokinins
105)	Which of the following is n	ot an inhibitory substance
	governing seed dormancy? [4]a) Para - ascorbic acidc) Phenolic acid	b) Abscisic acidd) Gibberellic acid
106)	Inclusion bodies of blue - gro	een, purple and green pho-
	a) Contractile vacuolesc) Gas vacuoles	b) Microtubules.d) Centrioles.
107)	Cilliates differ from all other	protozoans in: [4]
	 a) Using pseudopodia for ca b) Having two types of nuc c) Using flagella for locomed d) Having a contractile vac water 	apturing prey Elei otion cuole for removing excess
108)	In the five - kingdom classifie Chlorella have been included	cation, Chlamydomonas and in: [4]

- Algae
- c) Monera d) Plantae
- 109) The size of Pleuropneumonia like Organism (PPLO) is [4] a) 0.1μ m b) 1 - 2μ m
 - d) 10 20μ m c) 0.02μ m

- 110) Which of the following are likely to be present in deep sea water? [4]
 - a) Blue green algae b) Archaebacteria
 - Saprophytic fungi d) Eubacteria
- 111) Membrane bound organelles are absent in: [4]
 - a) Chlamydomonas b) Saccharomyces
 - c) Plasmodium d) Streptococcus
- 112) Select the correct option with respect to mitosis
 - i. Chromosomes move to the spindle equator and get aligned along the equatorial plate in metaphase
 - ii. Chromatids separate but remain in the centre of the cell in anaphase
 - iii. Chromatids start moving towards opposite poles in telophase.
 - iv. Golgi complex and endoplasmic reticulum are still visible at the end of prophase.

[4]

c)

- a) Statement (d) is correct.
- b) Statement (b) is correct.
- c) Statement (a) is correct.
- d) Statement (c) is correct.
- 113) Arrange the following events of meiosis in correct sequence:
 - i. Crossing over
 - ii. Synapsis
 - iii. Terminaiisation of chiasmata
 - iv. Disappearance of nucleolus
 - [4]
 - a) (B), (C), (D), (A) b) (B), (A), (D), (C) c) (A), (B), (C), (D) d) (B), (A), (C), (D)
- 114) Some dividing cells exit the cell cycle and enter the vegetative inactive stage. This is called the quiescent stage
 - (G_0). This process occurs at the end of: [4]
 - a) M phase b) G₁ phase
 - c) S phase d) G₂ phase
- 115) A stage in cell division is shown in the figure. Select the answer which gives correct identification of the stage with its characteristics.

[4]

- a) Telophase E. R. and nucleous not formed yet b) Cytokinesis - Cell plate formed, mitochondria dis-
- tributed between two daughter cells c) Telophase - Nuclear envelop reforms, Golgi com-
- plex reformsd) Late anaphase Chromosomes move away from equatorial plate, Golgi complex not present
- 116) In meiosis crossing over is initiated at: [4]
 - a) Leptotene b) Diplotene
 - c) Pachytene d) Zygotene
- 117) Which of the following is not a characteristic feature during mitosis in somatic cells? [4]
 - a) Disappearance of nucleolus
 - b) Synapsis
 - c) Spindle fibres
 - d) Centromere of the chromosome

- 118) What is true about ribosomes? [4]
 - a) The prokarytotic ribosomes are 80 S, where S stands for sedimentation coefficient
 - b) These are composed of ribonucleic acid and proteins
 - c) These are found only in eukaryotic cells
 - d) These are self splicing introns of same RNAs
- 119) Which of the following pair of organelles does not contain DNA? [4]
 - a) Chloroplast and Vacuoles
 - b) Mitochondria and Lysosomes
 - c) Lysosomes and Vacuoles
 - d) Nuclear envelope and Mitochondria
- 120) Which structures perform the function of mitochondria in bacteria? [4]
 - a) Nucleoid b) Ribosomes
 - d) Cell wall
- 121) Match List I with List II.

c) Mesosome

List - I	List - II
(A) Cristae	(i) Primary
	constriction in
	chromosome
(B) Thylakoids	(ii) Disc - shaped
	sacs in Golgi
	apparatus
(C) Centromere	(iii) Infoldings in
	mitochondria
(D) Cistemae	(iv) Flattened
	membranous sacs in
	stroma of plastids

[4]

- a) (A) (iii), (B) (iv), (C) (i), (D) (ii)
- b) (A) (i), (B) (iv), (C) (iii), (D) (ii)
- c) (A) (iv), (B) (iii), (C) (ii), (D) (i)
- d) (A) (ii), (B) (iii), (C) (iv), (D) (i)
- 122) The main organelle involved in modification and routing of newly synthesised proteins to their destination is: [4]
 - a) Lysosome
 - b) Chloroplast

c)

- c) Endoplasmic reticulum
- d) Mitochondria
- 123) Peptide synthesis inside a cell takes place in: [4]
 - a) Ribosomes b) Mitochondria
 - c) Chromoplast d) Chloroplast
- 124) Pyruvate dehydrogenase activity during aerobic respiration requires [4]
 - a) Iron b) Calcium
 - c) Cobalt d) Magnesium
- 125) Aerobic respiratory pathway is approximately called [4]a) Anabolicb) Parabolic
 - Amphibolic d) Catabolic
- 126) Which statement is wrong for Kreb's cycle? [4]
 - a) There is one point in the cycle where FAD^+ is reduced to $FADH_2$
 - b) During conversion of succinyl CoA to succinic acid, a molecule of GTP is synthesised

- c) The cycle starts with the condensation of acetyl group (Acetyl CoA) with pyruvic acid to yield citric acid
- d) There are three points in the cycle where NAD⁺ is reduced to NADH + H⁺
- 127) Which of the following statements regarding mitochondria is incorrect? [4]
 - a) Inner membrane is convoluted with infoldings.
 - b) Enzymes of electron transport are embedded in outer membrane.
 - c) Mitochondrial matrix contains single circular DNA molecule and ribosomes.
 - d) Outer membrane is permeable to monomers of carbohydrates fats and proteins.
- 128) An example of colonial alga is: [4]
 - a) Spirogyra b) Chlorella
 - c) Ulothrix d) Volvox
- 129) Mannitol is stored food in: [4]
 - a) Chara Porphyra b)
 - c) Fucus d) Gracilaria
- 130) Cycas and Adiantum resemble each other in having: [4]
 - a) Motile sperms. b) Vessels.
 - c) Cambium d) Seeds
- 131) Archegoniophore occurs in: [4]
 - a) Adiantum b) Chara
 - c) Marchantia d) Funaria
- 132) Pinus seed cannot germinate and establish without fungal association. This is because: [4]
 - a) It has obligate association with mycorrhizae
 - b) Its seeds contain inhibitors that prevent germination
 - c) It has very hard seed coat
 - d) Its embryo is immature
- 133) Read the following five statements (i v) and answer as asked next to them :
 - i. In Equisetum the female gametophyte is retained on the parent sporophyte.
 - ii. In Ginkgo male gametophyte is not independent.
 - iii. The sporophyte in Riccia is more developed than that in Polytrichum.
 - iv. Sexual reproduction in Volvox is isogamous.
 - v. The spores of slime moulds lack cell walls.
 - How many of the above statements are correct? [4] a) Four

	b)	Two
	1)	701

- d) Three
- 134) Which one of the following statements is wrong? [4]
 - a) Chlorella and Spirulina are used as space food
 - b) Agar agar is obtained from Gelidium and Gracilaria
 - c) Algin and carrageen are products of algae
 - d) Mannitol is stored food in Rhodophyceae
- 135) Which of the following statements is wrong?
 - i. Laminaria and Sargassum are used as food.
 - ii. Algae increases the level of dissolved oxygen in the immediate environment.
 - iii. Algin is obtained from red algae and carrageen from brown alga.
 - iv. Agar agar is obtained from Gelidium and Gracilaria.
 - [4]

c)

c) One

- Statement d is wrong a) b) Statement b is wrong
 - Statement c is wrong d) Statement a is wrong

ZOOLOGY

- 136) A typical fat molecule is made up of: [4]
 - a) Three glycerol molecules and three fatty acid molecules
 - b) One glycerol molecules and three fatty acid molecules
 - c) Three glycerol molecules and one fatty acid molecule
 - d) One glycerol molecules and one fatty acid molecule
- 137) Properties of starch useful for making it storage material are:
 - i. Easily translocated
 - ii. Chemically non reactive
 - iii. Easily digestible
 - iv. Osmotically inactive
 - v. Synthesized during photosynthesis
 - [4]
 - a) (i) and (v) b) (ii) and (iii)
 - c) (iii) and (v) d) (ii) and (iv)
- 138) Macro molecule chitin is: [4]
 - a) Phosphorus containing polysaccharide
 - b) Nitrogen containing polysaccharide
 - c) Sulphur containing polysaccharide
 - d) Simple polysaccharide
- 139) Identify the substances having glycosidic bond and peptide bond, respectively in their structure: [4]
 - a) Chitin, cholesterol b) Glycerol, trypsin
 - c) Inulin, insulin d) Cellulose, lecithin
- 140) A phosphoglyceride is always made up of: [4]
 - a) A saturated or unsaturated fatty acid esterified to a phosphate group which is also attached to a glycerol molecule.
 - b) A saturated or unsaturated fatty acid esterified to a glycerol molecule to which a phosphate group is also attached.
 - c) Only an unsaturated fatty acid esterified to a glycerol molecule to which a phosphate group is also attached.
 - d) Only a saturated fatty acid esterified to a glycerol molecule to which a phosphate group is also attached.
- 141) Select the option which is not correct with respect to enzyme action: [4]
 - a) Addition of lot of succinate does not reverse the inhibition of succinic dehydrogenase by malonate.
 - b) Substrate binds with enzyme at its active site.
 - c) A non competitive inhibitor binds the enzyme at a site distinct from that which binds the substance.
 - d) Malonate is a competitive inhibitor of succinic dehydrogenase.
- 142) What external changes are visible after the last moult of a cockroach nymph? [4]
 - a) Anal cerci develop
 - b) Labium develops
 - c) Both fore and hind wings develop
 - d) Mandibles become harder
- 143) Identify the types of cell junctions that help to stop the leakage of the substances across a tissue and facilitation of communication with neighbouring cells via rapid transfer of ions and molecules. [4]
 - a) Adhering junctions and Tight junctions, respectively.
 - b) Tight junctions and Gap junctions, respectively.
 - c) Gap junctions and Adhering junctions, respectively.

- d) Adhering junctions and Gap junctions, respectively.
- 144) The function of the gap junction is to: [4]
 - a) Facilitate communication between adjoining cells by connecting the cytoplasm for rapid transfer of ions, small molecules and some large molecules
 - b) Separate two cells from each other
 - c) Performing cementing to keep neighbouring cells together
 - d) Stop substance from leaking across a tissue
- 145) Frogs differ from humans in possessing: [4]
 - a) Hepatic portal system
 - b) Thyroid
 - c) Nucleated RBCs
 - d) Paired cerebral hemispheres
- 146) Select the correct statement from the ones given below with respect to Periplaneta americana: [4]
 - a) There are 16 very long Malpighian tubules present at the junctions of midgut and hindgut.
 - b) Grinding of food is carried out only by the mouth parts.
 - c) Males bear a pair of short thread like anal styles.
 - d) Nervous system located dorsally, consists of segmentally arranged ganglia joined by a pair of longitudinal connective.
- 147) Following are the statements about prostomium of earthworm.
 - i. It serves as a covering for mouth.
 - ii. It helps to open cracks in the soil into which it can crawl.
 - iii. It is one of the sensory structures.
 - iv. It is the first body segment

Choose the correct answer from the options given below [4]

- a) (a), (b) and (c) are correct
- b) (b) and (c) are correct
- c) (a), (b) and (d) are correct
- d) (a), (b), (c) and (d) are correct
- 148) Which of the following structure or regions is incorrectly paired with its function? [4]
 - a) Corpus callosum: Band of fibres connecting left and right cerebral hemispheres.
 - b) Medulla oblongata: Controls respiration and cardiovascular reflaxes.
 - c) Limbic system: Consists of fibre tracts that interconnect different regions of brain: Controls movement.
 - d) Hypothalamus: Production of releasing hormones and regulation of temperature, hunger, and thrust.
- 149) Which of the following regions of the brain is incorrectly paired with its function? [4]
 - a) Cerebrum calculation and contemplation
 - b) Corpus callosum communication between the left and right cerebral cortices
 - c) Medulla oblongata homeostatic control
 - d) Cerebellum language comprehension
- 150) The human hind brain comprises three parts, one of which is: [4]
 - a) Corpus callosum b) Cerebellum
 - c) Hypothalamus
- d) Spinal

- 151) Injury localized to the hypothalamus would most likely disrupt: [4]
 - a) Executive functions, such as decision making
 - b) Regulation of body temperature
 - c) Co ordination during locomotion
 - d) Short term memory
- 152) Graves' disease is caused due to: [4]
 - a) Hyposecretion of the adrenal gland
 - b) Hypersecretion of the adrenal gland
 - c) Hyposecretion of the thyroid gland
 - d) Hypersecretion of the thyroid gland
- 153) In a normal pregnant woman, the amount of total gonadotropin activity was assessed. The result expected was: [4]
 - a) High level of FSH and LH in uterus to stimulate endometrial thickening.
 - b) High level of circulating HCG to stimulate estrogen and progesterone synthesis.
 - c) High level of circulating HCG to stimulate endometrial thickening.
 - d) High level of circulating FSH and LH in the uterus to stimulate implantation of the embryo.
- 154) Which one of the following pairs is incorrectly matched?

	Option		
	(a)	Corpus	Relaxin
		luteum	(Se-
_			cre-
			tion)
1			
	(b)	Insulin	Diabetes
			melli-
			tus
			(dis-
			ease)
	(c)	Glucagor	n Beta
	~ /	U	cells
			(source)
	(d)	Somatos	ta Đæ lta
			cells
			(Source)

[4]

- Option (d) b) Option (c) a) Option (b) c)
 - d) Option (a)

155) Fight or flight reactions cause activation of:

- i. The adrenal medulla, leading to increased secretion of epinephrine and norepinephrine.
- ii. The pancreas leading to a reduction in blood sugar levels.
- iii. The parathyroid glands, leading to increased metabolic rate.
- iv. The kidney, leading to suppression of rennin angiotensin aldosterone pathway.
- [4] Only A b) Only D a)
- d) Only C c) Only B
- 156) A pregnant female delivers a baby who suffers from stunted growth, mental retardation, low intelligence quotient, and abnormal skin. This is the result of: [4]

- a) Low secretion of growth hormone
- b) Deficiency of iodine in diet
- c) Cancer of the thyroid gland
- d) Over secretion of pars distalis
- 157) Match the following columns and select the correct op-

10n.	
Column - I	Column - II
(a) Floating Ribs	(i) Located between second and seventh ribs
(b) Acromion	(ii) Head of the Humerus
(c) Scapula	(iii) Clavicle
(d) Glenoid cavity	(iv) Do not connect with the sternum

[4]

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

 Lack of relaxation between successive stimuli in sustained muscle contraction is known as: [4]

a)	Tonus	b)	Spasm
2)	Tetemus	d)	Detigue

c)	Tetanus	d)	Fatigue

- 159) During muscular contraction which of the following events occur?
 - i. H zone disappears
 - ii. \boldsymbol{N} band widens
 - iii. I band reduces in width
 - iv. Myosine hydrolyzes ATP, releasing the ADP and Pi.
 - v. Z lines attached to actins are pulled inwards. Choose the correct answer from the options given below
 - [4]
 - a) (b), (c), (d), (e) only
 - b) (a), (b), (c), (d) only
 - c) (a), (c), (d), (e) only
 - d) (b), (d), (e), (a) only
- 160) It is much easier for a small animal to run uphill than for a large animal because: [4]
 - a) The efficiency of muscles in large animals is less than in the small animals
 - b) Smaller animals have a higher metabolic rate
 - c) It is easier to carry a small body weight
 - d) Small animals have a lower O_2 requirement
- 161) Select the favourable conditions required for the formation of oxyhaemoglobin at the alveoli. [4]
 - a) High pO_2 , high pCO_2 , less H⁺, higher temperature
 - b) Low pO_2 , high pCO_2 , more H⁺, higher temperature
 - c) High pO_2 , low pCO_2 , less H⁺, lower temperature
 - d) Low pO_2 , low pCO_2 , more H^+ , higher temperature
- 162) The figure given below shows a small part of human lung where exchange of gases takes place. Select the option which represents labelled part A, B, C or D correctly identified along with its function.



[4]

- a) B: Red blood cells transport of CO2 mainly
- b) D: Capillary wall exchange of O_2 and CO_2 takes place here
- c) A: Alveolar cavity main site of exchange of respiratory gases
- d) C: Arterial capillary passes oxygen to the tissues
- 163) Figure shows schematic plan of blood circulation in humans with labels A to D. Identify the label and give its function/s.



- a) B Pulmonary artery takes blood from heart to $lungs, P_{O_2} = 90 \text{ mm Hg}$
- b) D Dorsal aorta takes blood from heart to body parts, $P_{O_2} = 95 \text{ mm Hg}$
- c) A Pulmonary vein takes impure blood from body parts, $P_{O_2} = 60 \text{ mm Hg}$
- d) C Vena Cava takes blood from body parts to right auricle, $P_{CO_2} = 45 \text{ mm Hg}$
- 164) Lungs are made up of air filled sacs the alveoli, they do not collapse even after forceful expiration, because of:[4]
 - a) Tidal volume
 - b) Residual volume
 - c) Inspiratory reserve volume
 - d) Expiratory reserve volume
- 165) Which one of the following is a possibility for most of us in regard to breathing, by making a conscious effort?[4]
 - a) The lungs can be made fully empty by forcefully breathing out all air from them
 - b) One can breathe out air through Eustachian tubes by closing both the nose and the mouth
 - c) One can breathe out air totally without oxygen
 - d) One can consciously breathe in and breathe out by moving the diaphragm alone, without moving the ribs at all
- 166) Blood pressure in the pulmonary artery is : [4]
 - a) Less than that in the vena cava
 - b) More than that in the carotid
 - c) Same as that in the aorta
 - d) More than that in the pulmonary vein
- 167) Adult human RBCs are enucleate. Which of the following statement(s) is/are most appropriate explanation for this feature?
 - i. They do not need to reproduce
 - ii. They are somatic cells

- iii. They do not metabolize
- iv. All their internal space is available for oxygen transport

[4]

- a) Both (ii) and (iii) b) (i), (iii) and (iv) b) $O_{1} = O_{1} = O_{1}$
- c) Only (iv) d) Only (i)
- 168) Globulins maintained in human blood plasma are primarily involved in: [4]
 - a) Defense mechanisms of body
 - b) Osmotic balance of body fluids
 - c) Oxygen transport in the blood
 - d) Clotting of blood
- 169) People who have migrated from the planes to an area adjoining Rohtang Pass about six months back. [4]
 - a) Suffer from altitude sickness with symptoms like nausea, fatigue etc.,
 - b) Have the usual RBC count but their haemoglobin has very high binding affinity to oxygen.
 - c) Have more RBCs and their haemoglobin has a lower binding affinity to oxygen
 - d) Are not physically fit to play games like football
- 170) Which one of the following animals has two separate circulatory pathways? [4]
 - a) Lizard b) Frog
 - c) Whale d) Shark
- 171) Which one of the following option gives the correct categorization of six animals according to the type of nitrogenous wastes (A, B, C) they give out?

Options	A	B	C	
	Ammonotelic	Ureotelic	Uricotelic	
(A)	Pigeon,	Aquatic	Cockroach,	
	humans	amphibians,	frog	
		lizards		
(B)	Frog, Lizards	Aquatic	Cockroach	
		amphibia,	pigeon	
		humans		
(C)	Aquatic	Frog,	Pigeon,	
	amphibia	humans	lizards,	
			cockroach	
(D)	Aquatic	Cockroach,	Frog, pigeor	h,
	amphibia	humans	lizards	

[4]

a)	Option	(b)	
c)	Option	(a)	

- b) Option (d)
- d) Option (c)
- 172) One of the representatives of Phylum Arthropoda is: [4]
 a) Cuttle fish
 b) Puffer fish
 c) Flying fish
 d) Silver fish
- 173) Match Column I with Column II for housefly classification and select the correct option using the codes given below:

Column I	Column II
(A). Family	(i) Diptera
(B). Order	(ii) Arthropoda
(C). Class	(iii) Muscidae
(D). Phylum	(iv) Insecta

[4]

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

174) Consider following features:

i. Organ system level of organisation

ii. Bilateral symmetry

iii. True coelomates with segmentation of body Select the correct option of animal groups that possess

- all the above characteristics. [4]
 - a) Annelida, Arthropoda and Chordata
 - b) Arthropoda, Mollusca and Chordata
 - c) Annelida, Mollusca and Chordata
 - d) Annelida, Arthropoda and Mollusca
- 175) Match the following columns and select the correct op-

	tion.	
	Column - I	Column - II
	(a) Gregarious,	(i) Asterias
	polyphagous pest	
	(b) Adult with	(ii) Scorpion
	radial symmetry	
	and larva with	
	bilateral symmetry	
	(c) Book lungs	(iii) Ctenoplana
	(d) Bioluminescence	(iv) Locusta
1		

[4]

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

176) Match the following organisms with their respective characteristics:

(a) Pila	(i) Flame cells	
(b) Bombyx	(ii) Comb plates	
(c) Pleurobrachia	(iii) Radula	
(d) Taenia	(iv) Malpighian tubules	

Select the correct option from the following: [4]

- a) (a) (ii), (b) (iv), (c) (iii), (d) (i)
- b) (a) (iii), (b) (ii), (c) (i), (d) (iv)
- c) (a) (iii), (b) (iv), (c) (ii), (d) (i)
- d) (a) (iii), (b) (ii), (c) (iv), (d) (i)
- 177) The increase in osmolarity from outer to inner medullary interstitium is maintained due to
 - i. Close proximity between Henle's loop and vasa recta.
 - ii. Counter current mechanism.
 - iii. Selective secretion of HCO_3^- and hydrogen ions in PCT.
 - iv. Higher blood pressure in glomerular capillaries.
 - [4]
 - a) Only (ii) b) (i) and (ii)
 - c) (i), (ii) and (iii) d) (iii) and (iv)
- 178) Which one of the following correctly explains the function of a specific part of the human nephron? [4]

- a) Afferent arteriole: carries the blood away from the glomerulus towards renal vein
- b) **Henle's loop**: most reabsorption of the major substances from the glomerular filtrate
- c) **Distal convoluted tubule**: reabsorption of K+ ions into the surrounding blood capillaries
- d) **Podocytes**: create minute spaces (slit pores) for the filtration of blood into the Bowman's capsule
- 179) Which of the following factors is responsible for the formation of concentrated urine? [4]
 - a) Low levels of antidiuretic hormone.

- b) Hydrostatic pressure during glomerular filtration.
- c) Maintaining hyperosmolarity towards inner medullary interstitium in the kidneys.
- d) Secretion of erythropoietin by Juxtaglomerular complex.
- 180) A fall in glomerular filtration rate (GFR) activates: [4]
 - a) Juxta glomerular cells to release rennin.
 - b) Posterior pituitary to release vasopressin.
 - c) Adrenal medulla to release adrenaline.
 - d) Adrenal cortex to release aldosterone.