

SATISH SCIENCE ACADEMY DHANORI PUNE - 411015

NEET PAPER 3 ENTRANCE EXAM - NEET-UG

Time Allowed: 3 hours and 20 minutes

Maximum Marks : 720

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General Instructions:

- The test is of 3 hours and 20 minutes and it contains 200 questions. Internal choice is given within the sections.
- 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 (Section-A)

- 1) The velocity v (in cm/sec) of a particle is given in terms of time t (in sec) by the equation: $v = at + \frac{b}{t + c}$. The dimensions of a, b and c are: [4]
 - a) $A = [L^2], b = [T], c = [LT^2]$ b) $A = [LT^{-2}], b = [L], c = [T]$ c) $A = [L], b = [LT], c = [T^2]$
 - d) $A = [LT^2], b = [LT], c = [L]$
- 2) Joule \times second is the unit of: [4]
 - a) Momentum b) Plank's constant
 - c) Energy d) Angular Velocity
- 3) A particle moves in a straight line with a constant acceleration. It changes its velocity from 10 ms⁻¹ to 20 ms⁻¹ while passing through a distance 135 m in t second. The value of t is: [4]

a)	12 8	D)	98
c)	10 s	d)	1.8 s

- 4) A projectile can have the same range R for two angles of projection. If t₁ and t₂ be the times of flight in the two cases, then what is the product of two times of flight?
 [4]
- 5) A rigid ball of mass m strikes a rigid wall at 60° and gets reflected without loss of speed as shown in the figure.



The value of impulse imparted by the wall in the ball will be: [4]

a)	$\frac{mv}{2}$	b)	Mv
c)	$\frac{\overline{mv}}{3}$	d)	2mv

6) A body of mass 1 kg is thrown upwards with a velocity 20 m/s. It momentarily comes to rest after attaining a height of 18 m. How much energy is lost due to air friction? ($g = 10 \text{ m/s}^2$) [4]

	0	/ L - J		
a)	30 J		b)	20 J
c)	10 J		d)	40 J

- 7) A body of mass 2.0 kg makes an elastic collision with another body at rest and continues to move in the original direction but with one fourth of its original speed v. What is the mass of other body and the speed of the two body center of mass? [4]
 - a) 1.0 kg and $\frac{2}{3}v$ b) 1.5 kg and $\frac{4}{7}v$ c) 1.4 kg and $\frac{10}{17}v$
 - d) 1.2 kg and $\frac{5}{8}v$
- 8) When a ceiling fan is switched off, its angular velocity falls to half while it makes 36 rotations. How many more rotations will it make before coming to rest? [4]
 a) 18
 b) 24
 c) 12
 d) 36
- 9) Two stones of masses m and 2m are whirled in horizontal circles, the heavier one in a radius ^r/₂ and the lighter one in radius r. The tangential speed of lighter stone is n times that of the value of heavier stone when they experience same centripetal forces. The value of n is: [4]
 a) 2
 b) 3
 c) 4
 d) 1
- A satellite is orbiting around the earth with total energy E. What will happen if the satellite's kinetic energy is made 2 E? [4]
 - a) Radius of the orbit is halved
 - b) Period of revolution is doubled
 - c) Satellite escapes away
 - d) Radius of the orbit is doubled
- 11) According to Kepler's law, the period of revolution of a planet (T) and its mean distance from the sun (R) are related by the equation: [4]
 (R) T³P³ constant
 - a) T^3R^3 = constant b) T^2R = constant c) TR^3 = constant d) T^2R^{-3} = constant

12) The aerofoils are so designed that the speed of air:

- i. On the top side is more than on the lower side
- ii. On the top side is less than on the lower side
- iii. Is same on both sides
- iv. Is turbulent
- [4]

a)	Iii and iv	b)	Only i
c)	Iv and i	d)	Only ii

- 13) During melting process, the heat given to a body is utilized in:
 - i. Increasing the temperature
 - ii. Increasing the density of material
 - iii. Increasing the average distance of the molecules
 - iv. Decreasing the mass of the body

[4]

a)	Iv and i
c)	I and ii

- b) Ii and iii d) Only iii
- 14) A bimetallic strip consists of metals X and Y. It is mounted rigidly at the base as shown in the figure. The metal X has a higher coefficient of expansion as compared to that for metal Y. When the bimetallic strip is placed in a cold bath?



[4]

- a) It will not bend but shrink
- b) It will bend towards the right
- c) It will bend towards the left
- d) It will bend but shrink
- 15) An ideal monoatomic gas is taken through the thermodynamic states $A \rightarrow B \rightarrow C \rightarrow D$ via the paths shown in the figure. If U_A, U_B, U_C and U_D represent the internal energy of the gas in state A, B, C and D respectively, then which of the following is not true?

- [4] b) $U_B = U_c$ d) $U_A = U_D$ a) $U_B < U_A$ c) $U_C = U_D$
- 16) A cylinder contains hydrogen gas at pressure of 249 kPa and temperature 27°C. Its density is: $(R = 8.3 \text{ J mol}^{-1})$ K⁻¹) [4]

a)	0.2 kg/m^3	b) 0.02 kg/m ³
c)	0.5 kg/m^3	d) 0.1 kg/m ³

- 17) Total energy of a particle performing SHM depends on: [4]
 - a) Amplitude and time period
 - b) Amplitude and displacement
 - c) Amplitude and time period and displacement
 - d) Time period and displacement
- 18) The velocity of sound in a gaseous medium is 330 ms^{-1} . If the pressure is increased by 4 times without a change in temperature, the velocity of sound in the gas is: [4] a) 660 ms ^{- 1} b) 156 ms⁻ c) 330 ms ^{- 1} d) 990 ms ^{- 1}
- 19) A person speaking normally produces a sound intensity of 40 dB at a distance of 1 m. If the threshold intensity for reasonable audibility is 20 dB, the maximum distance at which he can be heard clearly is: [4]

		2	
a)	20 m	b) :	5 m
c)	10 m	d) -	4 m

20) A thin conducting ring of radius R is given a charge +Q. The electric field at the centre O of the ring due to the charge on the part AKB of the ring is E. The electric field at the centre due to the charge on the part ACDB of the ring is:



a)	3E along OK	
c)	E along OK	

b) 3E along KO E along KO d)

- 21) A parallel plate capacitor of capacitance 20μ F is being charged by a voltage source whose potential is changing at the rate of 3 V/s. The conduction current through the connecting wires, and the displacement current through the plates of the capacitor, would be, respectively: [4]
 - a) Zero, 60μ A b) 60μ A, zero
 - c) 60μ A, 60μ A d) Zero, zero
- 22) Two batteries, one of emf 18 volt and internal resistance 2Ω and the other of emf 12 volt and internal resistance 1 Ω , are connected as shown in the adjoining figure. The voltmeter V will record a reading of:



23) A cylindrical conductor of radius R is carrying a constant current. The plot of the magnitude of the magnetic field, B with the distance, d, from the centre of the conductor, is correctly represented by the figure: [4]



- 24) In a moving coil galvanometer the deflection of the $coil\theta$ is related to the electric current I by the relation: [4]
 - a) $I \propto \theta^2$ b) $I \propto \theta$ c) $I \propto \sqrt{\theta}$ d) $I \propto \tan \theta$
- 25) A long magnetic needle of length 2L, magnetic moment M and pole strength m units is broken into two pieces at the middle. The magnetic moment and pole strength of each piece will be : [4]

a)	$\frac{M}{2}, \frac{m}{2}$	b)	M, m
c)	$\tilde{M}, \frac{m}{2}$	d)	$\frac{M}{2}, m$

26) Induced emf in the coil depends upon:

- i. The conductivity of the coil
- ii. Amount of flux
- iii. Rate of change of linked flux

iv. Resistance of coil

[4]

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

27) A current of 1 amp flows through an inductor of inductance 0.1 H. What is the maximum magnetic energy stored in the inductor? [4]

a)	0.01 J	D)	0.5 J
c)	0.1 J	d)	0.05 J

- 28) The instantaneous current in a circuit is, $I = \sqrt{2}$ sin $(\omega t + \phi)$ ampere. The rms value of current (in ampere) is: [4]
 - b) $\frac{1}{\sqrt{2}}$ d) $\sqrt{2}$ a) 2 c) 1
- 29) The quality factor of LCR circuit having resistance (R) and inductance (L) at resonance frequency (ω) is given by: [4]
 - a) $\frac{R}{\omega L}$ b) $\left(\frac{\omega L}{R}\right)^{\frac{1}{2}}$ c) $\frac{\omega L}{R}$ d) $\left(\frac{\omega L}{R}\right)^2$
- 30) The frequencies of X rays, γ rays and ultraviolet rays are respectively a, b and c. Then: [4]
 - a) A < b, b < cb) A > b, b > cc) A > b, b < cd) A < b, b > c
- 31) A disc is placed on the surface of the pond which has a refractive index of 5/3. A source of light is placed 4 m below the surface of the liquid. The minimum radius of disc needed so that light is not coming out is: [4]
 - a) 3 m b) 6 m
 - c) 4 m d) ∞
- 32) Diffraction and interference of light suggest [4]
 - a) Wave nature
 - b) Nature of light is electro magnetic
 - c) Nature is quantum
 - d) Nature of light is transverse
- 33) A photoelectric surface is illuminated successively by monochromatic light of wavelength λ and $\frac{\lambda}{2}$. If the maximum kinetic energy of the emitted photoelectrons in the second case is 3 times that in the first case, the work function of the surface of the material is: (h = Planck's)constant, c = speed of light [4]

- a) $\frac{hc}{3\lambda}$ b) $\frac{hc}{\lambda}$ c) $\frac{2hc}{\lambda}$ d) $\frac{hc}{2\lambda}$
- 34) The ratio of wavelengths of the last line of Balmer series and the last line of Lyman series is: [4]

a)	0.5	b)	4
c)	1	d)	2

35) The Binding energy per nucleon of ${}_{3}^{7}$ Li and ${}_{2}^{4}$ He nuclei are 5.60 MeV and 7.06 MeV, respectively. In the nuclear reaction ${}_{3}\text{Li}^{7}$ + ${}_{1}\text{H}^{1}$ \rightarrow ${}_{2}\text{He}^{4}$ + ${}_{3}\text{He}^{4}$ + Q the value of energy Q released is: [4]

a)	8.4 MeV	b) 19.6 MeV
c)	- 2.4 MeV	d) 17.3 MeV

PHYSICS (Section-B)

Attempt any 10 questions

36) The slope of the kinetic energy versus position vector gives the rate of change of: [4]

b) Force a) Work c) Velocity d) Momentum

37) A solid cylinder of mass M and radius R rolls down an inclined plane without slipping. The speed of its centre of mass when it reaches the bottom is: (h is the height of inclined plane) [4]

a)
$$\sqrt{2gh}$$

b) $\sqrt{\frac{4}{3}gh}$
c) $\sqrt{\frac{3}{4}gh}$
d) $\sqrt{\frac{4g}{h}}$

38) The figure shows a planet in an elliptical orbit around the sun S. Where is the kinetic energy of the planet maximum?

$$[4] \\ (a) P_4 \\ (b) P_2 \\ (c) P_3 \\ (c) P_3 \\ (c) P_3 \\ (c) P_1 \\ (c) P_2 \\ (c) P_3 \\ (c) P_1 \\ (c) P_1$$

- 39) The unit of thermal conductivity is: [4]
 - a) $J m^{-1} K^{-1}$ b) $W m K^{-1}$
 - c) J m K⁻¹ d) W m $^{-1}$ K $^{-1}$
- 40) In stationary waves, antinodes are the points where there is:
 - i. Minimum displacement and minimum pressure change
 - ii. Minimum displacement and maximum pressure change
 - iii. Maximum displacement and maximum pressure change
 - iv. Maximum displacement and minimum pressure change
 - [4]

c)

- Only iv b) I and ii a) c) Iii and iv d) Ii and iii
- 41) Apparatus used to find out velocity of sound in gas is:
 - [4] Quincke's tube b) Kundt's apparatus a)
 - Melde's apparatus d) Kundt's tube
- 42) Two long parallel wires P and Q are both perpendicular to the plane of the paper with a distance of 5 m between them. If P and Q carry current of 2.5 amp and 5 amp respectively in the same direction, then the magnetic field at a point half - way between the wires is: [4] (110)

a)
$$\left(\frac{\mu_0}{\pi}\right)$$

b) $\left(\frac{\sqrt{3}\mu_0}{2\pi}\right)$
c) $\left(\frac{3\mu_0}{2\pi}\right)$
d) $\left(\frac{\mu_0}{2\pi}\right)$

43) Nickel shows ferromagnetic property at room temperature. If the temperature is increased beyond Curie temperature, then it will show: [4]

c)

- a) Anti ferromagnetism b) Paramagnetism
 - No magnetic property d) Diamagnetism
- 44) A conducting square loop of side L and resistance R moves in its plane with a uniform velocity v perpendicular to one of its sides. A magnetic induction B, constant in time and space, pointing perpendicular and into the plane of the loop exists everywhere. The current induced in the loop is:

[4]

- a) Zero
- b) $\frac{Blv}{R}$ anticlockwise
- c) $\frac{Blv}{R}$ clockwise
- d) $\frac{2Blv}{R}$ anticlockwise
- 45) A resistor R, an inductor L, a capacitor C and voltmeters V_1 , V_2 and V_3 are connected to an oscillator in the circuit as shown in the adjoining diagram. When the frequency of the oscillator is increased, then at the resonance frequency, the voltmeter reading is zero in the case of:



[4]

- a) Voltmeter V1
- b) Voltmeter V₃
- c) Voltmeter V₂
- d) All the three voltmeters
- 46) A simple telescope, consisting of an objective of focal length 60 cm and a single eye lens of focal length 5 cm is focussed on a distant object in such a way that parallel rays emerge from the eye lens. If the object subtends an angle of 2° at the objective, the angular width of the image is: [4]
 - a) 10° b) 24° c) 50° d) $(\frac{1}{6})^{\circ}$
- 47) For which one of the following, Bohr model is not valid?[4]
 - a) Singly ionized helium atom (He⁺)
 - b) Hydrogen atom
 - c) Singly ionized neon atom (Ne⁺)
 - d) Deuteron atom
- 48) If alpha, beta and gamma rays carry the same momentum, which has the longest wavelength? [4]
 - a) γ rays
 - b) β rays
 - c) α rays
 - d) None, all have same wavelength
- 49) The ratio of the largest to shortest wavelengths in the Lyman series of hydrogen spectra is: [4]

a)	$\frac{4}{3}$	b)	$\frac{25}{9}$
c)	$\frac{9}{5}$	d)	$\frac{17}{6}$

50) The radioactivity of a sample is A_1 at time t_1 and A_2 at time t_2 . If the mean life of the specimen is T, the number of atoms that have disintegrated in the time interval of $(t_2 - t_1)$ is: [4]

- a) $\frac{(A_1 A_2)}{T}$ b) $(A_1 - A_2)T$ c) $A_1t_1 - A_2t_2$
- d) $(A_1 A_2)$

CHEMISTRY (Section-A)

b) 1

- One litre hard water contains 12.00 mg Mg²⁺. Milliequivalents of washing soda required to remove its hardness is: [4]
 - a) 12.16× 10⁻³
 c) 12.16
 - 12.16 d) 1×10^{-3}
- 52) The total number of electrons that can be accommodated in all the orbitals having principal quantum number 2 and azimuthal quantum number 1 are: [4]
 - a) 2 b) 8 c) 4 d) 6

53) Identify the wrong statement in the following:

- i. Amongst isoelectronic species, the smaller the positive charge on the cation, the smaller is the ionic radius.
- ii. Amongst isoelectronic species, the greater the negative charge on the anion, the larger is the ionic radius.
- iii. The atomic radius of the elements increases as one moves down the first group of the periodic table.
- iv. The atomic radius of the elements decreases as one moves across from left to right in the 2nd period of the periodic table.
- [4]

ц.,			
a)	Only B	b)	Only D
- >	0.1.1. C	(L	0.1

c) Only C d) Only A

54) Which of the following species is paramagnetic? [4]

a) CN ⁻	b)	O_2^2
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c)	CO	d)	NO

- 55) Among the following which compound will show the highest lattice energy?
 - i. KF
 - ii. NaF
 - iii. CsF
 - iv. RbF
 - [4]

a) B b) A c) C d) D

- 56) Linear combination of two hybridized orbitals belonging to two atoms and each having one electron leads to the formation of: [4]
 - a) Sigma bond
 - b) Co ordinate covalent bond
 - c) Double bond
 - d) Pi bond
- 57) If enthalpies of formation $\text{for}C_2H_4(g)$, $CO_2(g)$ and $H_2O(l)$ at 5°C and 1 atm pressure are 52, 394 and 286 kJ/mol respectively, then enthalpy of combustion of $C_2H_4(g)$, will be [4] a) + 14.2 kJ/mol b) - 1412 kJ/mol
 - c) + 141.2 kJ/mol d) 141.2 kJ/mol
- 58) If the value of an equilibrium constant for a particular reaction is 1.6×10^{12} , then at equilibrium the system will contain: [4]
 - a) Mostly reactants
 - b) Mostly products
 - c) All reactants

- 59) Which of the following reactions disproportionation reaction?
 - i. $2Cu^+ \rightarrow Cu^{2+} + Cu^0$ ii. $3MnO_4^{2-} + 4H^+ \rightarrow 2MnO_4^- + MnO_2 + 2H_2$ iii. $2KMnO_4 \xrightarrow{\Delta} K_2MnO_4 + MnO_2 + O$ iv. $2MnO_4^- + 3Mn^{2+} + 2H_2O \rightarrow 5MnO_2 + 4H$ Select the correct option from the following is: [4] a) I, ii and iii b) I and ii only c) I and iv only d) I, iii and iv
- 60) The correct order of N compounds in its decreasing order of oxidation states is: [4]
 a) HNO₃, NH₄CI, NO, N₂ b) HNO₃, NO, NH₄CI, N₂
 - c) NH₄CI, N₂, NO, HNO₃ d) HNO₃, NO, N₂, NH₄CI
- 61) Which of the following is the most basic oxide? [4]
 a) Sb₂O₃
 b) SeO₂
 c) Bi₂O₃
 d) Al₂O₃
- 62) Which of the following structure is similar to graphite? [4]
 - a) B b) B_2H_6
 - c) BN d) B_4C
- 63) Correct increasing order of acidity is given as:i. H₂O, C₂H₂, H₂CO₃, phenol
 - ii. C_2H_2, H_2O, H_2CO_3 , phenol
 - iii. Phenol, C_2H_2 , H_2CO_3 , H_2O
 - iv. C_2H_2 , H_2O , phenol and H_2CO_3
 - [4]
 - a) Only B or A correct b) Only C correct
 - c) Only A correct d) Only D correct
- 64) The cylindrical shape of an alkyne is due to: [4]
 - a) Three sigma C C bonds
 - b) Three π C C bonds
 - c) Two sigma C C and one π C C bonds
 - d) One sigma C C and two π C C bonds
- 65) Dihedral angle of least stable conformer of ethane is: [4]
 a) 0°
 b) 120°
 c) 180°
 c) 180°
 - c) 180° d) 60°
- 66) A solution has a 1 : 4 mole ratio of pentane to hexane. The vapour pressures of pure hydrocarbons at 20°C are 440 mm Hg for pentane and 120 mm Hg for hexane. The mole fraction of pentane in vapour phase would be:
 [4]
 a) 0.549 b) 0.786

c) 0.478 d) 0.20	<i>a)</i>	0.549	0)	0.760
	c)	0.478	d)	0.200

- 67) If 8 g of a non electrolyte solute is dissolved in 114 g of n octane to reduce its vapour pressure to 80%, the molar mass (in g mol⁻¹) of the solute is: [Given that molar mass of n octane is 114 g mol⁻¹][4]
 a) 40
 b) 80
 c) 20
 d) 60
- 68) A solution contains Fe^{2+} , Fe^{3+} and I ⁻ ions. This solution was treated with iodine at 35°C. E° for Fe^{3+}/Fe^{2+} is 0.77V and E° for $I_2/2I^- = 0.536$ V. The favourable redox reaction is: [4]
 - a) I $\mbox{-}$ will be oxidised to I_2
 - b) There will be no redox reaction
 - c) Fe^{2+} will be oxidised to Fe^{3+}
 - d) I_2 will be reduced to I ⁻
- 69) The pressure of H_2 required to make the potential of H_2 electrode zero in pure water at 298 K is: [4]

- a) 10^{-14} atm b) 10^{-12} atm c) 10^{-10} atm d) 10^{-4} atm
- 70) An increase in the concentration of the reactants of a reaction leads to change in [4]
 - a) Threshold energy. b) Activation energy.
 - c) Heat of reaction. d) Collision frequency.
- 71) In a reaction, A + B→ Product, rate is doubled when the concentration of B is doubled, and rate increases by a factor of 8 when the concentrations of both the reactants (A and B) are doubled, rate law for the reaction can be written as: [4]
 a) Rate = k[A][B]
 b) Rate = k[A]² [B]
 - c) Rate = $k[A]^2 [B]^2$ d) Rate = $k[A][B]^2$
- 72) Calomel on reaction with NH₄OH gives: [4] a) HgNH₂Cl b) Hg₂O c) NH₂—Hg—Hg—Cl d) HgO
- 73) Which of the following bonds will be most polar? [4]
 a) O—F
 b) N—N
 c) N—F
 d) N—Cl
- 74) The correct order of ionic radii of Y^{3+} , La^{3+} , Eu^{3+} and Lu^{3+} is:
 - (Atomic no's. Y = 39, La = 57, Eu = 63, Lu = 71) [4]
 - a) $Y^{3+} < La^{3+} < Eu^{3+} < Lu^{3+}$
 - b) $La^{3+} < Eu^{3+} < Lu^{3+} < Y^{3+}$
 - c) $Y^{3+} < Lu^{3+} < Eu^{3+} < La^{3+}$ d) $Lu^{3+} < Eu^{3+} < La^{3+} < Y^{3+}$
- 75) The structure and hybridisation of Si(CH₃)₄ is: [4]
 a) Tetrahedral, sp³
 b) Trigonal, sp²
 c) Bent, sp
 d) Octahedral, sp³d
- 76) Which complex compound will give four isomers? [4]
 - a) [Fe(en)₃]Cl₃
 b) [Fe(PPh₃)₃ NH₃ClBr]Cl
 c) [Co(PPh₃)₃ Cl]Cl₃
 d) [Co(en)₂Cl₂]Cl
- 77) If there is no rotation of plane polarized light by a compound in a specific solvent, though to be chiral, it may mean that: [4]
 - a) The compound is certainly a chiral.
 - b) The compound is certainly meso
 - c) There is no compound in the solvent
 - d) The compound may be a racemic mixture
- 78) Among the following four compounds
 - i. Phenol
 - ii. Methyl phenol
 - iii. Meta nitrophenol
 - iv. Para nitrophenol
 - The acidity order is: [4]

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

- d) (ii) > (i) > (iii) > (iv)
- 79) The correct structure of the product**A** formed in the reaction:

$$\underbrace{\frac{H_{2(g)}, 1 \text{ atmosphere})}{Pd/carbon, ethanol}} A$$
[4]



- 80) Anline is reacted with bromine water and the resulting product is treated with an aqueous solution of sodium nitrite in presence of dilute hydrochloric acid. The compound so formed is converted into a tetrafluoroborate which is subsequently heated. The final product is: [4]
 - a) 1,3,5 tribromobenzene
 - b) P bromoaniline
 - c) 2,4,6 tribromofluorobenzene
 - d) P bromofluorobenzen
- 81) A reagent suitable for the determination of N terminal residue of a peptide is: [4]
 - a) Carboxypeptidase
 - b) 2, 4 dinitrophenyl hydrazine
 - c) P toluene sulphonyl chloride
 - d) 2, 4 dinitro fluorobenzene
- 82) The non essential amino acid among the following is:[4]

a)	Alanine	b)	Leucine
c)	Lysine	d)	Valine

- 83) The following metal ion activates many enzymes, participates in the oxidation of glucose to produce ATP and with Na, is responsible for the transmission of nerve signals.[4]
 - a) Copper b) Potassium c) Iron d) Calcium
- 84) Which of the following compounds has the lowest boiling point? [4]

a) $CH_3CH_2CH_2CH_3$ b) $CH_3CH_2CH_2CH_2CH_3$ c) $CH_3CH=CH - CH_2CH_3$ d) $CH_3CH=CH$ $CH=CH_2$

85) The reaction of: CH_3 —CH=CH— $\langle \rangle$ —

with HBr gives: [4]





CHEMISTRY (Section-B)

	Attempt any 10 questions	
86)	Which of the following specie i. CO ii. CN - iii. O ₂ ²⁻ iv. NO	es is paramagnetic?
	IV. INO [4]	
	(4) a) A c) B	b) C d) D
87)	Which one of the following SO_2 is passed through acidifie i. Green $Cr_2(SO_4)_3$ is fonne ii. The solution turns blue iii. The solution is decolouri iv. SO_2 is reduced	statements is correct when ed $K_2Cr_2O_7$ solution? ed zed
	a) Only iv c) Only i	b) Iii and ivd) Ii and iv
88)	Which of the following oxid characteristic for lead and tin a) +2, +2 c) +4, +2	lation states are the most respectively? [4] b) +2, +4 d) +4, +4
89)	Identify the correct order of the function i. $Ca^{2+} < K^+ < Ar < Cl^{-1}$ ii. $Ar < Ca^{2+} < K^+ < Cl^{-1}$ iii. $Ca^{2+} < Ar < K^+ < Cl^{-1}$ iv. $Ca^{2+} < K^+ < Ar < S^{2-1}$ [4] a) Only C	he size of the following: < S ^{2 -} < S ^{2 -} < S ^{2 -} < Cl ⁻ b) Only A
	c) Only B	d) Only D
90)	Maximum number of electron atom is determined by the fol a) 41 +2 c) 21 + 1	as in a sub - shell of an lowing: [4] b) $2n^2$ d) 41 - 2
91)	Boron compounds behave as La [4]	ewis acids, because of their:
	a) Acidic natureb) Electron deficient naturec) Covalent natured) Ionisation property	
92)	A first - order reaction has 10^{-2} sec $^{-1}$. How much tim the reaction to reduce to 5g? a) 138.6 sec c) 238.6 sec	a specific reaction rate of ne will it take for 20 g of [4] b) 693.0 sec d) 346.5 sec
93)	The half - life period of a fir seconds. The specific rate con	st - order reaction is 1386 stant of the reaction is: [4]

- seconds. The specific rate constant of the reaction is: [4] a) $0.5 \times 10^{-2} \text{ s}^{-1}$ b) $5.0 \times 10^{-2} \text{ s}^{-1}$ c) $5.0 \times 10^{-3} \text{ s}^{-1}$ d) $0.5 \times 10^{-3} \text{ s}^{-1}$
- 94) The correct order of the mobility of the alkali metal ions in aqueous solution is: [4]

a) $K^+ > Rb^+ > Na^+ > Li^+$ b) $Rb^+ > K^+ > Na^+ > Li^+$

c) $Na^+ > K^+ > Rb^+ > Li^+$

95) Standard reduction potentials at 25°C of Li+/Li, Ba2+/Ba, Na⁺/Na and Mg²⁺/Mg are - 3.05, - 2.90, - 2.71 and -2.37 V respectively. Which one of the following is the strongest oxidizing agent? [4]

a)	Mg ⁻	D)	INa ⁺
c)	Li ⁺	d)	Ba ²⁺

96) Which of the following is used in the preparation of chlorine? [4]

a)	Both	MnO_2	and	b)	Either	MnO_2	or
	KMnO ₄				KMnO ₄		
c)	Only K	MnO ₄		d)	Only M	nO_2	

97) When orthophosphoric acid is heated to 600°C, the product formed is: [4] 1 \ HaP DO

a)	H_3PO_3	b)	P_2O_5
c)	HPO ₃	d)	PH_3

- 98) Which of the following pairs have the same size? [4] b) Zr⁴⁺, Hf⁴⁺ a) Zn^{2+} , Hf^{4+} c) Zr⁴⁺, Ti⁴⁺ d) Fe^{2+} , Ni^{2+}
- 99) Red precipitate is obtained when ethanol solution of dimethylglyoxime is added to ammoniacal Ni(II). Which of the following statements is not true?

dimethylglyoxime =
$$\begin{array}{c} H_3C-C = N \\ I \\ H_3C-C = N \\ OH \end{array}$$

[4]

c)

- a) Red complex has a square planar geometry
- b) Red complex has a tetrahedral geometry
- c) Dimethylglyoxime functions as bidentate ligand
- d) Complex has symmetrical H bonding
- 100) Consider following the sequence of reactions compound[A] $\xrightarrow{\text{Reduction}}$ [B] $\xrightarrow{\text{HNO}_2}$ CH₃CH₂OH The compound [A]is: [4] b) CH₃NO₂ a) CH₃CN

CH_3CH_2CN	d)	CH ₃ NC

BOTANY (Section-A)

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

- b) (a) (iii), (b) (ii), (c) (iv), (d) (i) c) (a) - (iv), (b) - (iii), (c) - (ii), (d) - (i)
- d) (a) (iv), (b) (ii), (c) (i), (d) (iii)
- 102) Pick up the wrong statement:
 - i. Nuclear membrane is present in Monera.
 - ii. Cell wall is absent in Animalia.
 - iii. Protista have photosynthetic and heterotrophic modes of nutrition.

iv. Some fungi are edible. [4]

- a) Statement (i) wrong.
- b) Statement (ii) wrong.
- c) Statement (iii) wrong.
- d) Statement (iv) wrong.
- 103) The motile bacteria are able to move by: [4] a) Flagella b) Fimbriae Cilia d) Pili c)

104) Match Column - I with Column - II

Watch Column - 1 wi	ui Columni - II.
Column - I	Column - II
(A) Saprophyte	(i) Symbiotic
	association of fungi
	with plant roots
(B) Parasite	(ii) Decomposition
	of dead organic
	materials
(C) Lichens	(iii) Living on
	living plants or
	animals
(D) Mycorrhiza	(iv) Symbiotic
-	association of algae
	and fungi

[4]

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

- 105) Which one of the following may require pollinators, but is genetically similar to autogamy? [4]
 - a) Cleistogamy b) Xenogamy
 - c) Geitonogamy d) Apogamy
- 106) Which one of the following is correct statement?
 - i. A antheridiophores and archegoniophores are present in pteridophytes
 - ii. Pteridophytes gametophyte has a protonemal and leafy stage
 - iii. In gymnosperms, female gametophyte is free living
 - iv. Origin of seed habit can be traced in pteridophytes [4]
 - a) Statement c is correct
 - b) Statement a is correct
 - c) Statement b is correct
 - d) Statement d is correct
- 107) Besides paddy fields, cyanobacteria are also found inside vegetative part of: [4]
 - b) Psilotum a) Equisetum
 - Cycas d) Pinus c)
- 108) Both autogamy and geitonogamy are prevented in: [4] a) Castor
 - b) Maize Cucumber
 - d) Papaya

d) Xenogamy

- 109) In which of the following pollination is autogamous? [4] a) Chasmogamy b) Cleistogamy
 - c) Geitonogamy

c)

110)	Among china ros	e, mustard,	brinjal, potato	o, guava, cu-
	cumber, onion, an	d tulip, how	many plants	have superior
	ovary? [4]			
	a) Four		b) Three	

c)	Five	d)	Six

111) Which one of the following statements is correct? [4]

- a) Mango is parthenocarpic fruit
- b) A proteinaceous aleurone layer is present in maize grain
- c) The seed in grasses is not endospermic
- d) A sterile pistil is called a staminode
- 112) Plant having little or no secondary growth are: [4]
 - a) Deciduous angiosperms
 - b) Conifers
 - c) Grasses
 - d) Cycads
- 113) If a colour blind man marries a woman who is homozygous for normal colour vision, the probability of their son being colour blind is: [4]
 - a) 0.75 b) 0 c) 1 d) 0.5
- 114) The frequency of recombination between gene pairs on the same chromosome as a measure of the distance between
 - genes was explained by: [4]
 - a) Sutton Boveri
 - c) Alfred Sturtevant d) T.H. Morgan

b) Gregor J. Mendel

- 115) Balbiani rings are sites of: [4]
 - a) Polysaccharide synthesis
 - b) Nucleotide synthesis
 - c) RNA and protein synthesis
 - d) Lipid synthesis
- 116) If the distance between two consecutive base pairs is 0.34 nm and the total number of base pairs of a DNA double helix in a typical mammalian cell is 6.6×10^9 bp, then the length of the DNA is approximately: [4]
 - a) 2.7 meters b) 2.5 meters
 - c) 2.0 meters d) 2.2 meters
- 117) Protein synthesis in an animal cell occurs: [4]
 - a) On ribosomes present in the nucleolus as well as in cytoplasm
 - b) On ribosomes present in cytoplasm as well as in mitochondria
 - c) Only on the ribosomes present in cytosol
 - d) Only on ribosomes attached to the nuclear envelope and endoplasmic reticulum
- 118) Plasmodesmata are: [4]
 - a) Lignified cemented layers between cells
 - b) Connections between adjacent cells
 - c) Membranes connecting the nucleus with plasmalemma
 - d) Locomotory structures
- 119) Identify the wrong statement with reference to immunity.[4]
 - a) Foetus receives some antibodies from the mother, it is an example of passive immunity.
 - b) Active immunity is quick and gives a full response.
 - c) When exposed to antigen (living or dead) antibodies are produced in the host's body. It is called "Active immunity".

- d) When ready made antibodies are directly given, it is called "Passive immunity".
- 120) Antivenom injection contains preformed antibodies while polio administered into the body contain: [4]
 - a) Activated pathogens b) Harvested antibodies
 - c) Attenuated pathogens d) Gamma globulin
- 121) In meiosis crossing over is initiated at: [4]
 - a) Leptotene b) Diplotene
 - c) Pachytene d) Zygotene
- 122) Which one of the following is categorised as a parasite in true sense? [4]
 - a) Head louse living on the human scalp as well as laying eggs on human hair
 - b) The female Anopheles bites and sucks blood from humans
 - c) The cuckoo (koel) lays its egg in crow's nest
 - d) Human foetus developing inside the uterus draws nourishment from the mother
- 123) What type of ecological pyramid would obtained with the following data?
 - Secondary consumer: 120 g;
 - Primary consumer: 60g;
 - Primary producer: 10 g [4]
 - a) Inverted pyramid of biomass
 - b) Inverted pyramid of energy
 - c) Upright pyramid of numers
 - d) Upright pyramid of biomass
- 124) Which of the following is a commercial blood cholesterol lowering agent? [4]
 - a) Cyclosporin A b) Lipases
 - c) Streptokinase d) Statin
- 125) Which of the following National Parks is home to the famous musk deer or hangul ? [4]
 - a) Eaglenest Wild life Sanctuary, Amnachal Pradesh
 - b) Keibul Lamjao National Park, Manipur
 - c) Dachigam National Park, Jammu and Kashmir
 - d) Bandhavgarh National Park, Madhya Pradesh
- 126) In the following in each set a conservation approach and an example of method of conservation are given
 - i. In situ conservation Biosphere Reserve
 - ii. Ex situ conservation Sacred groves
 - iii. In situ conservation Seed bank
 - iv. Ex situ conservation Cryo preservation
 Select the option with correct match of approach and method
 - [4]
 - a) (A) and (D) b) (A) and (C)
 - c) (A) and (B) d) (B) and (D)
- 127) Red list contains data or information on: [4]
 - a) Threatened species
 - b) Marine vertebrates only
 - c) All economically important plants
 - d) Plants whose products are in international trade
- Identify the stage when homologous chromosomes separate but sister chromatids remain associated. [4]
 - a) Metaphase I b) Anaphase I
 - c) Anaphase II d) Metaphase II
- 129) 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 c) S phase
- b) G₁ phase
- d) G₂ phase
- 130) Which of the following statements is incorrect?
 - i. Cyclic photophosphorylation involves both PS I and PS II.
 - ii. Both ATP and NADPH + H+ are synthesized during non - cyclic photophosphorylation.
 - iii. Stroma lamellae have PS I only and lack NADP reductase.
 - iv. Grana lamellae have both PS I and PS II.
 - [4]
 - a) Statement c is incorrect.
 - b) Statement a is incorrect.
 - c) Statement b is incorrect.
 - d) Statement d is incorrect.
- 131) A process that makes important difference between C_3 and C₄ plants is: [4]
 - a) Photorespiration b) Photosynthesis
 - c) Glycolysis d) Transpiration
- 132) If the total incident solar radiation the proportion of PAR is: [4]
 - a) About 70% b) Less than 50%
 - c) About 60% d) More than 80%
- 133) Pyruvate dehydrogenase activity during aerobic respiration requires [4]
 - a) Iron b) Calcium
 - d) Magnesium c) Cobalt
- 134) Inhibitory substances in dormant seeds cannot be removed by subjecting seeds to [4]
 - a) Nitrate b) Ascorbic acid
 - c) Gibberellic acid d) Chilling conditions
- 135) Name the plant growth regulator which upon spraying on sugarcane crop, increases the length of stem, thus increasing the yield of sugarcane crop. [4]
 - a) Abscisic acid b) Ethylene
 - c) Gibberellin d) Cytokinin

BOTANY (Section-B)

Attempt any 10 questions

- 136) In which group of organisms the cell wall form two thin overlapping shells which fit together? [4]
 - a) Slime moulds b) Euglenoids
 - c) Dinoflagellates d) Chrysophytes
- 137) Which one of the following statements about viruses is correct? [4]
 - a) Viruses are obligate parasites.
 - b) Viruses possess their own metabolic system
 - c) Nucleic acid of viruses is known as capsid.
 - d) All viruses contain both RNA and DNA.
- 138) Which one is wrongly matched? [4]
 - a) Unicellular organism Chlorella
 - b) Uniflagellate gametes Polysiphonia
 - c) Biflagellate zoospores Brown algae
 - d) Gemma cups Marchantia
- 139) Flowers which have single ovule in the ovary and are packed into inflorescence are usually pollinated by: [4]
 - a) Water b) Bee d) Wind c) Bat
- 140) Which of the following is not a stem modification? [4]

- a) Thoms of citrus
- b) Flattened structures of Opuntia
- c) Pitcher of Nepenthes
- d) Tendrils of cucumber
- 141) Fruit colour in squash is an example of: [4]
 - a) Dominant epistasis b) Recessive epistasis
 - c) Inhibitory genes d) Complementary genes
- 142) In sea urchin DNA, which is double stranded, 17% of the bases were shown to be cytosine. The percentages of the other three bases expected to be present in this DNA are: [4]
 - a) G 17%, A 16.5%, T 32.5%
 - b) G 17%, A 33%, T 33%
 - c) G 8.5%, A 50%, T 24.5%
 - d) G 34%, A 24.5%, T 24.5%
- 143) Nuclear envelope is a derivative of: [4]
 - a) Smooth endoplasmic reticulum
 - b) Rough endoplasmic reticulum
 - c) Membrane of Golgi complex
 - d) Microtubules
- 144) Select the mismatch: [4]
 - a) Anabaena Nitrogen fixer
 - b) Rhizobium Alfalfa
 - c) Frankia Alnus
 - d) Rhodospirillum -Mycorrhiza
- 145) The most common substrate used in distilleries for the production of ethanol is: [4] b) Com meal
 - a) Soya meal
 - c) Ground gram d) Molasses
- 146) The three boxes in this diagram represent the three major biosynthetic pathways in aerobic respiration. Arrows represent net reactants or products.

Arrows numbered 4, 8, and 12 can all be: [4]

- a) H_2O b) ATP
- c) FAD^+ or $FADH_2$ d) NADH

147) Which of the following statements is incorrect?

- i. Biomass decreases from first to fourth trophic level. ii. Energy content gradually increases from first to fourth trophic level.
- iii. Number of individuals decreases from first trophic level to fourth trophic level.
- iv. Energy content gradually decreases from first to fourth trophic level.
- [4]
 - a) Statement d is incorrect.
 - b) Statement c is incorrect.
 - c) Statement b is incorrect.
 - d) Statement a is incorrect.
- 148) Phototropic curvature is the result of uneven distribution of: [4]
 - a) Auxin c) Cytokinins
- b) Phytochrome d) Gibberellin
- 149) Which of the following is not an inhibitory substance governing seed dormancy? [4]
 - a) Para ascorbic acid
 - b) Abscisic acid
 - c) Phenolic acid
- d) Gibberellic acid

- 150) Which of the following statements is incorrect?
 - i. RuBisCO is a bifunctional enzyme.
 - ii. In C₄ plants, the site of RuBisCO activity is mesophyll cell.
 - iii. The substrate molecule for RuBisCO activity is a 5- carbon compound.
 - iv. RuBisCO action requires ATP and NADPH.

[4]

- a) Statement (a) is incorrect.
- b) Statement (d) is incorrect.
- c) Statement (c) is incorrect.
- d) Statement (b) is incorrect.

ZOOLOGY (Section-A)

151) Match List - I with List - II

List - I	List - II
(a) Physalia	(i) Pearl oyster
(b) Limulus	(ii) Portuguese Man of War
(c) Ancylostoma	(iii) Living fossil
(d) Pinctada	(iv) Hookworm

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

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

152) The terga, sterna, and pleura of cockroach body are joined by: [4]

a)	Muscular	tissue	b)	Cartilage

- c) Cementing glue d) Arthrodial membrane
- 153) An important characteristic that Hemichordates share with Chordates is: [4]
 - a) Pharynx with gill slits
 - b) Pharynx without gill slits
 - c) Absence of notochord
 - d) Ventral tubular nerve cord
- 154) 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.
- 155) Choose the correctly matched pair: [4]
 - a) Adipose Tissue Dense connective tissue
 - b) Areolar tissue Loose connective tissue
 - c) Cartilage Loose connective tissue
 - d) Tendon Specialized connective tissue
- 156) Due to increasing air borne allergens and pollutants, many people in urban areas are suffering from respiratory disorder causing wheezing due to [4]
 - a) Inflammation of bronchi and bron chioles.
 - b) Benign growth on mucous lining of nasal cavity.

- c) Proliferation of fibrous tissues and damage of the alveolar walls.
- d) Reduction in the secretion of surfactants by pneumocytes.
- 157) When you hold your breath, which of the following gas changes in blood would first lead to the urge to breathe?[4]
 - a) Falling CO₂ concentration
 - b) Rising CO₂ concentration
 - c) Falling O_2 concentration
 - d) Rising CO_2 and falling O_2 concentration
- 158) 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
- 159) 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
- 160) The figure shows a diagrammatic view of the human respiratory system with labels A, B, C, and D. Select the option which gives correct identification and main function and/or characteristic.



[4]

- a) B pleural membrane surround ribs on both sides to provide cushion against rubbing
- b) D Lower end of lungs diaphragm pulls it down during inspiration
- c) A trachea long tube supported by complete cartilaginous rings for conducting inspired air
- d) C Alveoli thin walled vascular bag like structures for exchange of gases
- 161) GnRH, a hypothalamic hormone, needed in reproduction acts on: [4]
 - a) Posterior pituitory gland and stimulates secretion of oxytocin and FSH
 - b) Anterior pituitory gland and stimulates secretion of LH and FSH
 - c) Posterior pituitory gland and stimulates secretion of LH and relaxin
 - d) Anterior pituitory gland and stimulates secretion of LH and oxytocin
- 162) In human adult females, oxytocin: [4]
 - a) Stimulates pituitary to secrete vasopressin

- b) Causes strong uterine contractions during parturition
- c) Is secreted by embryo.
- d) Stimulates the growth of mammary glands
- 163) In human female, the blastocyst: [4]
 - a) Getsimplanted into uterus 3 days after ovulation.
 - b) Forms placenta even before implantation.
 - c) Gets implanted in endometrium by the trophoblast cell.
 - d) Gets nutrition from uterine endometrial secretion only after implantation.
- 164) Which of the following sexually transmitted diseases is not completely curable? [4]
 - a) Genital warts b) Genital herpes
 - c) Gonorrhoea d) Chlamydiasis
- 165) Artificial insemination means: [4]
 - a) Introduction of sperms of a healthy donor directly into the ovary
 - b) Transfer of sperms of a healthy donor to a test tube containing ova
 - c) Artificial introduction of sperms of a healthy donor into the vagina
 - d) Transfer of sperms of husband to a test tube containing ova.
- 166) The eye of Octopus and eye of Cat shows different patterns of structure, yet they perform a similar function. This is an example of: [4]
 - a) Homologous organs that have evolved due to convergent evolution.
 - b) Homologous organs that have evolved due to divergent evolution.
 - c) Analogous organs that have evolved due to convergent evolution.
 - d) Analogous organs that have evolved due to divergent evolution.
- 167) The extinct human who lived 1,00,000 to 40,000 years ago, in Europe, Asia and parts of Africa, with short stature, heavy eye brows, retreating fore heads, large jaws with heavy teeth, stocky bodies, a lumbering gait and stooped posture was: [4]
 - a) Ramapithecus b) Neanderthal human
 - c) Homo habilis d) Cro magnon humans
- 168) Which of the following causes an increase in sodium reabsorption in the distal convoluted tubule? [4]
 - a) Increase in antidiuretic hormone levels
 - b) Decrease in antidiuretic hormone levels
 - c) Decrease in aldosterone levels
 - d) Increase in aldosterone levels
- 169) Human urine is usually acidic because: [4]
 - a) Excreted plasm a proteins are acidic
 - b) The sodium transporter exchanges one hydrogen ion for each sodium ion, in peritubular capillaries
 - c) Hydrogen ions are actively secreted into the filtrate
 - d) Potassium and sodium exchange generates acidity
- 170) Use of an artificial kidney during hemodialysis may result in:
 - i. Nitrogenous waste build up in the body
 - ii. Non elimination of excess potassium ions
 - iii. Reduced absorption of calcium ions from the gastrointestinal tract

iv. Reduced RBC productionWhich of the following options is the most appropriate?[4]

a) (iii) and (iv) are correctb) (i) and (iv) are correct

- c) (ii) and (iii) are correct
- d) (i) and (ii) are correct
- 171) Glenoid cavity articulates: [4]
 - a) Scapula with acromion
 - b) Clavicle with scapula
 - c) Clavicle with acromion
 - d) Humerus with scapula
- 172) Select the correct statement with respect to locomotion in humans:
 - i. A decreased level of progesterone causes osteoporosis in old people
 - ii. Accumulation of uric acid crystals in joints causes their inflammation
 - iii. The vertebral column has 10 thoracic vertebrate
 - iv. The joint between adjacent vertebrae is a fibrous joint
 - [4]
 - a) Only C b) Only B
 - c) Only A d) Only D
- 173) Lack of relaxation between successive stimuli in sustained muscle contraction is known as: [4]
 - a) Tonus b) Spasm
 - c) Tetanus d) Fatigue
- 174) 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
- 175) Stimulation of a muscle fibre by a motor neuron occurs at: [4]
 - a) The sarcoplasmic reticulum
 - b) The neuromuscular junction
 - c) The transverse tubules
 - d) The myofibril
- 176) Which of the following structures of regions is incorrectly paired with its function?

Option			
(a)	Medulla oblon-	Controls respi-	
	gata	ration	
		and	
		cardio-	
		lar	
		re-	
		flexes.	
(b)	Corpus	Band	
	sum	fibers	
	built	con-	
		nect-	
		ing	
		left	
		right	
		cere-	
		bral	
		hemi-	
		spheres.	
(c)	Hypotha	la Pros luctio	on
		of re-	
		hor-	
		mones	
		and	
		regula-	
		tem-	
		pera-	
		ture	
		hunger	
		thirst.	
(d)	Limbic	Consists	
	system	of	
		tibre	
		that	
		inter-	
		con-	
		nect	
		11.00	
		differ-	
		differ- ent re-	
		differ- ent re- gions	
		differ- ent re- gions of	
		differ- ent re- gions of brain;	
		differ- ent re- gions of brain; con- trols	
		differ- ent re- gions of brain; con- trols move-	
		differ- ent re- gions of brain; con- trols move- ment.	

Option (a)

177) Name a peptide hormone that acts mainly on hepatocytes, adipocytes and enhances cellular glucose uptake

d) Option (b)

c) Option (c)

c) Glucagon d) Gastrin 178) The 24 hour (diurnal) rhythm of our body such as the sleep - wake cycle is regulated by the hormone: [4] a) Adrenaline b) Melatonin c) Calcitonin d) Prolactin 179) Match the following columns and select the correct option. Column - I Column - II (a) Eosinophils (i) Immune response (b) Basophils (ii) Phagocytosis (c) Neutrophils (iii) Release histaminase, destructive enzymes (d) Lymphocytes (iv) Release granules containing histamine [4] a) (a) - (i), (b) - (ii), (c) - (iv), (d) - (iii) b) (a) - (ii), (b) - (i), (c) - (iii), (d) - (iv) c) (a) - (iv), (b) - (i), (c) - (ii), (d) - (iii) d) (a) - (iii), (b) - (iv), (c) - (ii), (d) - (i) 180) Which of the following conditions cause erythroblastosis foetalis? [4] a) Both mother and foetus Rh - ve b) Both mother and foetus Rh+ve c) Mother Rh+ve and foetus Rh - ve d) Mother Rh^{- ve} and foetus Rh^{+ve} 181) 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] Both (ii) and (iii) b) (i), (iii) and (iv) a) Only (i) c) Only (iv) d) 182) Following statements describe the characteristics of the enzyme Restriction Endonuclease. Identify the incorrect statement. [4] a) The enzyme cuts the sugar - phosphate backbone at specific sites on each strand. b) The enzyme cuts DNA molecules at an identified position within the DNA. c) The enzyme recognizes a specific palindromic nucleotide sequence in the DNA. d) The enzyme binds DNA at specific sites and cuts only one of the two strands.

and utilization. [4] a) Secretin

b) Insulin

183) During the process of gene amplification using PCR, if very high temperature is not maintained in the beginning, then which of the following steps of PCR will be affected first? [4]

Extension a)

c)

- b) Denaturation
- Ligation
- d) Annealing
- 184) The laws and rules to prevent unauthorised exploitation of 1

bio -	resources	are	termed	as	-	[4]
Dia	athias			b)		Diamat

- Biopatenting a) Bioethics b) **Biopiracy** Bioengineering d)
- c)
- 185) The crops engineered for glyphosate are resistant/tolerant
 - to : [4] a) Fungi
 - b) Insects c) Herbicides d) Bacteria

ZOOLOGY (Section-B)

Attempt any 10 questions

- 186) Which one of these animals is not a homeotherm? [4]
 - a) Macropus c) Chelone
- b) Psittacula d) Camelus
- 187) In male cockroaches, sperms are stored in which part of the reproductive system? [4]
 - a) Seminal vesicle b) Testes
 - c) Vas deferens d) Mushroom glands
- 188) Match the items given in column -I with those in column - II and select the correct option given below

Column - I	Column - II
(I) Tricuspid valve	(i) Between left
	atrium and left
	ventricle
(II) Bicuspid valve	(ii) Between right
	ventricle and
	pulmonary artery'
(III) Semilunar	(iii) Between right
valve	atrium and right
	ventricle

Codes: [4]

- a) (I) (i), (II) (iii), (III) (ii) b) (I) - (ii), (II) - (i), (III) - (iii) c) (I) - (iii), (II) - (i), (III) - (ii) d) (I) - (i), (II) - (ii), (III) - (iii)
- 189) Two friends are eating together on a dining table. One of them suddenly starts coughing while swallowing some food. This coughing would have been due to improper movement of [4] a) Tongue b) Neck
 - c) Epiglottis d) Diaphragm
- 190) Which one of the following is the most likely root cause why menstruation is not taking place in regularly cycling human female? [4]
 - a) Fertilization of the ovum.
 - b) Maintenance of the hypertrophical endometrial lining.
 - c) Maintenance of high concentration of sex hormones in the blood streams.
 - d) Retention of well developed corpus luteum.
- 191) What is the figure given below showing in particular?



- [4]
- a)
 - Tubectomy
- b) Vasectomy
- Uterine cancer c)
- Ovarian cancer d)
- 192) Forelimbs of the cat, lizard used in walking, forelimbs of a whale used in swimming and forelimbs of bats used in flying are an example of: [4]
 - a) Convergent evolution b) Homologous organs
 - c) Analogous organs Adaptive radiation d)
- 193) Match the item given in column I with those in column - II and select the correct option given below

Column - II
(i) Accumulation of
uric acid in joints
(ii) Mass of
crystallised salts
within the kidney
(iii) Inflammation
in glomeruli
(iv) Presence of
glucose in urine

[4]

- a) (I) (i), (II) (ii), (III) (iii), (IV) (iv) b) (I) - (iv), (II) - (i), (III) - (ii), (IV) - (iii) c) (I) - (ii), (II) - (iii), (III) - (i), (IV) - (iv) d) (I) - (iii), (II) - (ii), (III) - (iv), (IV) - (i)
- 194) Three of the following pairs of the human skeletal parts are correctly matched with their respective inclusive skeletal category and one pair is not matched. Identify the non - matching pair.

Column I	Column II
(A) Humerus and	Appendicular
ulna	skeleton
(B) Malleus and	Ear ossicles
stapes	
(C) Sternum and	Axial skeleton
ribs	
(D) Clavicle and	Pelvic girdle
Glenoid cavity	

[4]

a)	Only B	b)	Only	A
			~ .	~

- c) Only D d) Only C
- 195) When a neuron is in resting state, i.e., not conducting any impulse, then axonal membrane is: [4]
 - a) Equally permeable to both Na⁺ and K⁺ ions
 - b) Comparatively more permeable to Na⁺ ions and nearly impermeable to K⁺ ions
 - Comparatively more permeable to K⁺ ions and nearly c) impermeable to Na⁺ ions

- d) Impermeable to both Na^{+} and K^{+} ions
- 196) Select the correct statement. [4]
 - a) Insulin is associated with hyperglycemia.
 - b) Insulin acts on pancreatic cells and adipocytes.
 - c) Glucocorticoids stimulate gluconeogenesis.
 - d) Glucagon is associated with hypoglycemia.
- 197) Injury to adrenal cortex is not likely to affect the secretion of which one of the following? [4]
 - a) Aldosterone
 - b) Cortisol
 - c) Both androstenedione and dehydroepiandrosterone
 - d) Adrenaline
- 198) How do parasympathetic neural signals affect the working of the heart? [4]
 - a) Reduce both heart rate and cardiac output
 - b) Both heart rate and cardiac output increase

- c) Heart rate is increased without affecting the cardiac output
- d) Heart rate decreases but cardiac output increases
- 199) The colonies of recombinant bacteria appear white in contrast to blue colonies of non recombinant bacteria because of: [4]
 - a) Non recombinant bacteria containing beta galactosidase
 - b) Inactivation of glycosidase enzyme in recombinant bacteria
 - c) Insertional inactivation of alpha galactosidase in recombinant bacteria
 - d) Insertional inactivation of alpha galactosidase in non - recombinant bacteria
- 200) Which of the following RNAs is not required for the synthesis of protein? [4]
 - a) SiRNA b) TRNA
 - c) RRNA d) MRNA