

NEET Part Test-07

TOPIC COVERED

Physics:	Moving Charge and Magnetism, Magnetism and Matter, Electromagnetic Induction
Chemistry:	Surface Chemistry, General Principles and Process of Isolation of Elements, The p – Block Elements, The d and f Block Elements
Botany:	Principles of Inheritance and Variation, Molecular Basis of Inheritance
Zoology:	Evolution

Duration: 3 hr 20 min

Max Marks: 720

General Instructions:

- The test will contain 200 Questions of Physics, Chemistry, Botany, and Zoology & The test will be objective type. (Attempt only 180).
- Every subject contains two Part A-35 Questions and Part B-15 Questions (Attempt only 10).
- All 35 Questions of Part-A are Compulsory to attempt
- Time given for test is 200 minutes.
- Marking is +4 for every correct answer, –1 for every wrong answer.
- You can reattempt the test in case of any technical issue.
- Test will start at 2:00 pm and students can attempt test at any time of their own preferences

PHYSICS

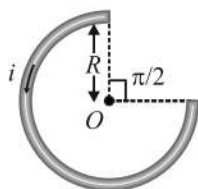
SECTION - A

1. A current i ampere flows along the inner conductor of a coaxial cable and returns along the outer conductor of the cable, then the magnetic induction at any point outside the conductor at a distance r metre from the axis is

- (1) ∞
- (2) Zero
- (3) $\frac{\mu_0 2i}{4\pi r}$
- (4) $\frac{\mu_0 2\pi i}{4\pi r}$

2. A current i ampere flows in a circular arc of wire whose radius is R , which subtend an angle $3\pi/2$ radian at its centre. The magnetic induction B at the centre is

- (1) $\frac{\mu_0 i}{R}$
- (2) $\frac{\mu_0 i}{2R}$
- (3) $\frac{2\mu_0 i}{R}$
- (4) $\frac{3\mu_0 i}{8R}$



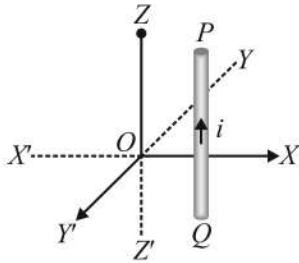
3. Two straight horizontal parallel wires are carrying the same current in the same direction, d is the distance between the wires. You are provided with a small freely suspended magnetic needle. At which of the following positions will the orientation of the needle be independent of the magnitude of the current in the wires

- (1) At a distance $d/2$ from any of the wires
- (2) At a distance $d/2$ from any of the wires in the horizontal plane
- (3) Anywhere on the circumference of a vertical circle of radius d and centre halfway between the wires
- (4) At points halfway between the wires in the horizontal plane

4. A straight wire of length (π^2) metre is carrying a current of $2A$ and the magnetic field due to it is measured at a point distant 1 cm from it. If the wire is to be bent into a circle and is to carry the same current as before, the ratio of the magnetic field at its centre to that obtained in the first case would be

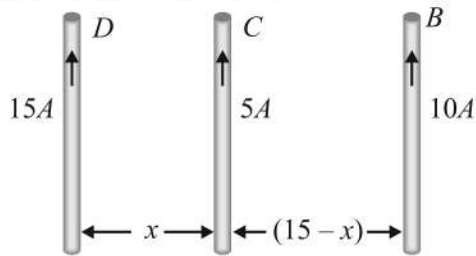
- (1) 50 : 1
- (2) 1 : 50
- (3) 100 : 1
- (4) 1 : 100

5. A vertical wire kept in $Z-X$ plane carries a current from Q to P (see figure). The magnetic field due to current will have the direction at the origin O along

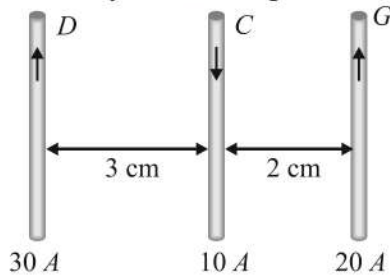


- (1) OX (2) OX'
 (3) OY (4) OY'
6. A circular coil 'A' has a radius R and the current flowing through it is I . Another circular coil 'B' has a radius $2R$ and if $2I$ is the current flowing through it, then the magnetic fields at the centre of the circular coil are in the ratio of (i.e. B_A to B_B)
 (1) 4 : 1 (2) 2 : 1
 (3) 3 : 1 (4) 1 : 1
7. The field due to a long straight wire carrying a current I is proportional to
 (1) I (2) I^2
 (3) \sqrt{I} (4) $1/I$
8. A beam of ions with velocity 2×10^5 m/s enters normally into a uniform magnetic field of 4×10^{-2} tesla. If the specific charge of the ion is 5×10^7 C/kg, then the radius of the circular path described will be
 (1) 0.10 m (2) 0.16 m
 (3) 0.20 m (4) 0.25 m
9. A proton (mass m and charge $+e$) and an α -particle (mass $4m$ and charge $+2e$) are projected with the same kinetic energy at right angles to the uniform magnetic field. Which one of the following statements will be true
 (1) The α -particle will be bent in a circular path with a small radius that for the proton
 (2) The radius of the path of the α -particle will be greater than that of the proton
 (3) The α -particle and the proton will be bent in a circular path with the same radius
 (4) The α -particle and the proton will go through the field in a straight line
10. A uniform magnetic field B is acting from south to north and is of magnitude 1.5 Wb/m². If a proton having mass = 1.7×10^{-27} kg and charge = 1.6×10^{-19} C moves in this field vertically downwards with energy 5 MeV, then the force acting on it will be
 (1) 7.4×10^{12} N
 (2) 7.4×10^{-12} N
 (3) 7.4×10^{19} N
 (4) 7.4×10^{-19} N
11. An α -particle travels in a circular path of radius 0.45 m in a magnetic field $B = 1.2$ Wb/m² with a speed of 2.6×10^7 m/sec. The period of revolution of the α -particle is
 (1) 1.1×10^{-5} sec (2) 1.1×10^{-6} sec
 (3) 1.1×10^{-7} sec (4) 1.1×10^{-8} sec
12. If a proton, deuteron and α -particle on being accelerated by the same potential difference enters perpendicular to the magnetic field, then the ratio of their kinetic energies is
 (1) 1 : 2 : 2 (2) 2 : 2 : 1
 (3) 1 : 2 : 1 (4) 1 : 1 : 2
13. The charge on a particle Y is double the charge on particle X . These two particles X and Y after being accelerated through the same potential difference enter a region of uniform magnetic field and describe circular paths of radii R_1 and R_2 respectively. The ratio of the mass of X to that of Y is
 (1) $\left(\frac{2R_1}{R_2}\right)^2$ (2) $\left(\frac{R_1}{2R_2}\right)^2$
 (3) $\frac{R_1^2}{2R_2^2}$ (4) $\frac{2R_1}{R_2}$
14. Through two parallel wires A and B , 10 and 2 ampere of currents are passed respectively in opposite direction. If the wire A is infinitely long and the length of the wire B is 2 m, the force on the conductor B , which is situated at 10 cm distance from A will be
 (1) 8×10^{-5} N
 (2) 4×10^{-7} N
 (3) 4×10^{-5} N
 (4) $4\pi \times 10^{-5}$ N
15. A current of 5 ampere is flowing in a wire of length 1.5 metres, A force of 7.5 N acts on it when it is placed in a uniform magnetic field of 2 Tesla. The angle between the magnetic field and the direction of the current is
 (1) 30° (2) 45°
 (3) 60° (4) 90°
16. A triangular loop of side l carries a current I . It is placed in a magnetic field B such that the plane of the loop is in the direction of B . The torque on the loop is
 (1) Zero
 (2) IBl
 (3) $\frac{\sqrt{3}}{2} I l^2 B^2$
 (4) $\frac{\sqrt{3}}{4} I B l^2$

17. Three long, straight and parallel wires carrying currents are arranged as shown in the figure. The wire C which carries a current of 5.0 amp is so placed that it experiences no force. The distance of wire C from wire D is then



- (1) 9 cm (2) 7 cm
(3) 5 cm (4) 3 cm
18. Three long, straight parallel wires carrying current, are arranged as shown in figure. The force experienced by a 25 cm length of wire C is



- (1) 10^{-3} N (2) 2.5×10^{-3} N
(3) Zero (4) 1.5×10^{-3} N
19. The magnetic field at a point x on the axis of a small bar magnet is equal to the field at a point y on the equator of the same magnet. The ratio of the distances of x and y from the centre of the magnet is
- (1) 2^{-3} (2) $2^{-1/3}$
(3) 2^3 (4) $2^{1/3}$

20. Two short magnets with their axes horizontal and perpendicular to the magnetic meridian are placed with their centres 40 cm east and 50 cm west of magnetic needle. If the needle remains undeflected, the ratio of their magnetic moments $M_1 : M_2$ is
- (1) 4 : 5 (2) 16 : 25
(3) 64 : 125 (4) $2 : \sqrt{5}$

21. A magnet of magnetic moment M is situated with its axis along the direction of a magnetic field of strength B . The work done in rotating it by an angle of 180° will be
- (1) $-MB$ (2) $+MB$
(3) 0 (4) $+2MB$

22. A small bar magnet of moment M is placed in a uniform field H . If magnet makes an angle of 30° with field, the torque acting on the magnet is
- (1) MH (2) $MH/2$
(3) $MH/3$ (4) $MH/4$

23. The incorrect statement regarding the lines of force of the magnetic field B is
- (1) Magnetic intensity is a measure of lines of force passing through unit area held normal to it
(2) Magnetic lines of force form a close curve
(3) Inside a magnet, its magnetic lines of force move from north pole of a magnet towards its south pole
(4) Due to a magnet magnetic lines of force never cut each other

24. A magnet of magnetic moment $50\hat{i} A-m^2$ is placed along the x -axis in a magnetic field $\vec{B} = (0.5\hat{i} + 3.0\hat{j})T$. The torque acting on the magnet is
- (1) $175\hat{k}$ N-m (2) $150\hat{k}$ N-m
(3) $75\hat{k}$ N-m (4) $25\sqrt{37}\hat{k}$ N-m

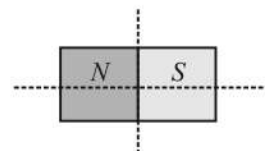
25. At a place the earth's horizontal component of magnetic field is 0.36×10^{-4} weber/m². If the angle of dip at that place is 60° , then the vertical component of earth's field at that place in weber/m² will be approximately
- (1) 0.12×10^{-4} (2) 0.42×10^{-4}
(3) 0.40×10^{-4} (4) 0.62×10^{-4}

26. If the angles of dip at two places are 30° and 45° respectively, then the ratio of horizontal components of earth's magnetic field at the two places will be
- (1) $\sqrt{3} : \sqrt{2}$ (2) $1 : \sqrt{2}$
(3) $1 : \sqrt{3}$ (4) 1 : 2

27. Two bar magnets with magnetic moments $2M$ and M are fastened together at right angles to each other at their centres to form a crossed system, which can rotate freely about a vertical axis through the centre. The crossed system sets in earth's magnetic field with magnet having magnetic moment $2M$ making an angle θ with the magnetic meridian such that

(1) $\theta = \tan^{-1}\left(\frac{1}{\sqrt{3}}\right)$ (2) $\theta = \tan^{-1}(\sqrt{3})$
(3) $\theta = \tan^{-1}\left(\frac{1}{2}\right)$ (4) $\theta = \tan^{-1}\left(\frac{3}{4}\right)$

28. Times period for a magnet is T . If it is divided in four equal parts along its axis and perpendicular to its axis as shown then time period for each part will be



- (1) $4T$ (2) $T/4$
(3) $T/2$ (4) T

29. In a diamagnetic material, atoms have
 (1) All unpaired electrons
 (2) No unpaired electron
 (3) Few unpaired electron
 (4) Only free electrons
30. Two identical bar magnets are joined in the middle such that their \vec{M} are at 60° with each other. If this combination is suspended freely in earth's magnetic field then the angle made by each magnet with magnetic meridian is
 (1) 60°
 (2) 90°
 (3) 30°
 (4) Any value from 0° to 60°
31. Two small bar magnets are placed in a line at certain distance d apart. If the length of each magnet is negligible compared to d , the force between them will be inversely proportional to
 (1) d^2
 (2) d
 (3) d^3
 (4) d^4
32. A bar magnet (dipole moment M) is bent in the middle such that two parts make angle of 120° with each other. Its new magnetic dipole moment is
 (1) $\frac{M}{2}$
 (2) $\frac{M}{4}$
 (3) $\frac{M\sqrt{3}}{2}$
 (4) $2\sqrt{3}M$
33. A magnetic dipole produces magnetic field B at a point at distance r from its centre and at an angle 60° with the direction of dipole moment. The magnetic field at distance $\frac{r}{2}$ at angle 90° with dipole moment
 (1) $\frac{7B}{5}$ (2) $\frac{16B}{\sqrt{7}}$
 (3) $\frac{\sqrt{7}B}{16}$ (4) $\frac{16B}{\sqrt{17}}$
34. Which of the following is correct about magnetic field lines?
 (1) These lines start at N pole and end at S pole
 (2) These lines are always directed from N to S pole
 (3) These lines always from circular loops
 (4) In non uniform field, these lines may be parallel to each other

35. "No magnetic monopole can exist separately"
 This statement is supported by
 (1) Faradays law of electromagnetic
 (2) Gauss law of magnetism
 (3) Ampere's circuital law
 (4) Ampere Maxwell's

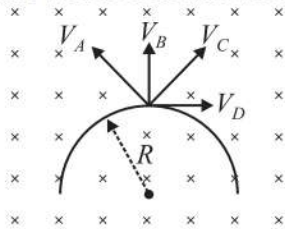
SECTION - B

(ATTEMPT ANY 10 QUESTIONS)

36. Which of the following is not suitable to make permanent magnets?
 (1) Cobalt-steel (2) Ticonal
 (3) Soft iron (4) Alnico
37. The difference between the susceptibility and relative permeability
 (1) Is always -1
 (2) Between 0 and 1
 (3) Between -1 and 1
 (4) Cannot be calculated as they have different unit
38. If a bar magnet experiences max torque τ in a uniform magnetic field then maximum change in potential energy in rotating this bar magnet in uniform field will be
 (1) 2τ (2) τ
 (3) $\tau/2$ (4) $\tau\sqrt{3}$
39. Magnetic flux is
 (1) Vector quantity
 (2) Scalar quantity
 (3) Neither scalar nor vector
 (4) It is only a number
40. The induced emf can be found by using
 (1) $\varepsilon = -\frac{d\phi_B}{dt}$ (2) $\varepsilon = -\frac{d\phi_B}{dx} \cdot \frac{dx}{dt}$
 (3) $\varepsilon = -\frac{d\phi_B}{dx}$ (4) Both (1) and (2)
41. A magnetic needle lying parallel to a magnetic field requires W units of work to turn it through 60° . The torque needed to maintain the needle in this position will be
 (1) W (2) $\sqrt{3}W$
 (3) $\frac{\sqrt{3}W}{2}$ (4) $2W$
42. If a bar magnet with vertical axis falls through a metallic loop with a cut then its acceleration is
 (1) $a = g$
 (2) $a < g$
 (3) $a > g$
 (4) $a \ll g$

43. In which of the following cases the emf is not induced in a coil?
- (1) If moving coil is entering the magnetic field perpendicular to its plane
 - (2) If moving coil is emerging out of the magnetic field perpendicular to its plane
 - (3) If moving coil is entering a uniform magnetic field along its plane
 - (4) Both (1) and (2)

44. Maximum induced emf is produced in a semicircular wire if it moves with

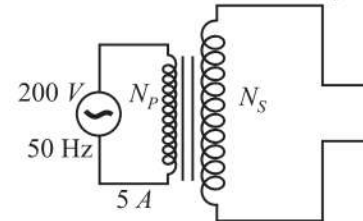


- (1) V_A
 - (2) V_B
 - (3) V_C
 - (4) V_D
45. The potential difference between any two points of a rod rotating about an axis perpendicular to length at one end is
- (1) $V = Bl^2\omega$
 - (2) $V = \frac{1}{2}Bl^2\omega$
 - (3) $V \leq \frac{1}{2}Bl^2\omega$
 - (4) $Bl^2\omega \geq V \geq \frac{1}{2}Bl^2\omega$
46. An aeroplane with wing span 10 m is flying horizontally at 100 m/s along magnetic equator. If the earth's magnetic field there is 5 mT then emf induced across the ends of the wings if
- (1) 50 V
 - (2) 5 V
 - (3) 0.5 V
 - (4) 0 V

47. The mutual inductance M of a pair of coils having self inductances L_1 and L_2 is given by

- (1) $M = \sqrt{L_1L_2}$
- (2) $M \leq \sqrt{L_1L_2}$
- (3) $M \geq \sqrt{L_1L_2}$
- (4) M is independent of L_1 and L_2

48. For a transformer having $N_S/N_P = 50$, as shown in figure, the current in the secondary open coil is



- (1) 100 mA
- (2) 250 mA
- (3) 200 mA
- (4) Zero

49. The magnetic moments of two bar magnets of same size are in the ratio 1 : 2. When they are placed one over the other with their similar poles together, then their period of oscillation in a magnetic field is 3s. If one of the magnets is reversed, then the period of oscillation in the same field will be

- (1) $\sqrt{3} s$
- (2) $3\sqrt{3} s$
- (3) 3 s
- (4) 6 s

50. A magnetic needle oscillation in a horizontal plane with a period T at a place where the angle of dip is 60° . When the same needle is made to oscillate in a vertical plane coinciding with the magnetic meridian, its period will be

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

CHEMISTRY

SECTION - A

51. Which of the following is the strongest base ?
(1) AsH₃ (2) SbH₃
(3) PH₃ (4) NH₃
52. The bond angles of NH₃, NH₄⁺ and NH₂⁻ are in the order
(1) NH₂⁻ > NH₃ > NH₄⁺
(2) NH₄⁺ > NH₃ > NH₂⁻
(3) NH₃ > NH₂⁻ > NH₄⁺
(4) NH₃ > NH₄⁺ > NH₂⁻
53. P – O – P bond is present in :
(1) H₄P₂O₆
(2) H₄P₂O₅
(3) Both (1) and (2)
(4) None of these
54. In H₂SO₄, there are
(1) Two sp³ hybridized centres and 2(pπ – dπ) bonds
(2) Three sp³ hybridized centres and 2(pπ – dπ)
(3) Four sp³ hybridized centres and 2(pπ – dπ) bonds
(4) Only one sp³ hybridized centre and 2(pπ – dπ) bonds
55. NH₄NO₃ decomposes on heating to give :
(1) NH₃ + HNO₃ (2) N₂ + H₂ + O₃
(3) NO + NO₂ + H₂ (4) N₂O + H₂O
56. Consider the reactions
I. Cu + conc. HNO₃ (hot) → Cu(NO₃)₂ + (X) + H₂O
II. Cu + dil. HNO₃ (cold) → Cu(NO₃)₂ + (Y) + H₂O
(1) N₂O, NO (2) NO₂, N₂O
(3) N₂, N₂O (4) NO₂, NO
57. Nitrogen forms stable N₂ molecule but phosphorus is converted P₄ from P₂. The reason for this is:
(1) triple bond is present between phosphorus atoms
(2) pπ – pπ bonding is weak
(3) pπ – pπ bonding is strong
(4) multiple bond is formed easily
58. The BCl₃ is a planar molecule whereas NCl₃ is pyramidal because :
(1) N–Cl bond is more covalent than B – Cl bond
(2) B – Cl bond is more polar than N – Cl bond
(3) Nitrogen atom is smaller than boron
(4) BCl₃ has no lone pair but NCl₃ has a lone pair of electron
59. Which of the following oxides is called mixed anhydride?
(1) P₄O₁₀ (2) NO₂
(3) N₂O₃ (4) N₂O₅
60. Bleaching properties of bleaching powder are due to its:
(1) oxidising properties
(2) reducing properties
(3) basic properties
(4) disinfecting properties
61. The froth floatation process is particularly suited for beneficiation of
(1) Galena
(2) Siderite
(3) Haematite
(4) Bauxite
62. Calamine is an ore of
(1) Zn (2) Mg
(3) Ca (4) P
63. In aluminothermite process, aluminium is used as
(1) oxidising agent
(2) flux
(3) reducing agent
(4) solder
64. Which one of the following reactions represents a calcination reaction?
(1) HgS + O₂ → Hg + SO₂
(2) Ag₂S + NaCl → AgCl + Na₂S
(3) CuCO₃ · Cu(OH)₂ → CuO + CO₂ + H₂O
(4) Al₂O₃ + NaOH → NaAlO₂ + H₂O
65. Cupellation process is used in the metallurgy of
(1) Cu
(2) Ag
(3) Zn
(4) Al

66. The blistered appearance of "Blister copper" is due to the evolution of
 (1) SO_2 (2) NO_2
 (3) CO_2 (4) P_2O
67. Which of the following is not an ore of iron?
 (1) Haematite (2) Limonite
 (3) Siderite (4) Malachite
68. Silver ore dissolves in dilute solution of NaCN in the presence of air to form
 (1) AgCN (2) $[\text{Ag}(\text{CN})_2]^-$
 (3) AgCNO (4) $[\text{Ag}(\text{CN})_3]^{3-}$
69. Which among the following is not diamagnetic?
 (1) Cu^{+2} (2) Zn^{+2}
 (3) Ag^+ (4) Cd^{2+}
70. Transition metals are less reactive because of their
 (1) high I.P. and low melting point
 (2) high I.P. and high melting point
 (3) low I.P. and low melting point
 (4) low I.P. and high melting point
71. Which of the following valence shell configuration belong to transition elements?
 (1) $3s^23p^63d^5, 4s^1$
 (2) $3s^23p^63d^{10}, 4s^24p^3$
 (3) $3s^23p^63d^{10}, 4s^24p^1$
 (4) $4s^24p^64d^{10}, 5s^25p^1$
72. In the dichromate ion $\text{Cr}_2\text{O}_7^{2-}$
 (1) 4 Cr–O bonds are equivalent
 (2) 6 Cr–O bonds are equivalent
 (3) all Cr–O bonds are equivalent
 (4) all Cr–O bonds are non-equivalent
73. $\text{K}_2\text{Cr}_2\text{O}_7$ on heating gives
 (1) Cr_2O_3 (2) K_2CrO_4
 (3) O_2 (4) All of these
74. Which of the following is not an actinide?
 (1) Curium (2) Californium
 (3) Uranium (4) Erbium
75. The outer electronic configuration of lawrencium ($Z = 103$) is.
 (1) $[\text{Rn}]5f^{13}7s^27p^2$
 (2) $[\text{Rn}]5f^{13}6d^17s^27p^1$
 (3) $[\text{Rn}]5f^{14}6d^17s^2$
 (4) $[\text{Rn}]5f^{14}7s^27p^1$
76. In colloidal state, particle size ranges from
 (1) 1 to 10 Å (2) 20 to 50 Å
 (3) 10 to 1000 Å (4) 1 to 280 Å
77. Which of the following is most effective in causing the coagulation of ferric hydroxide sol?
 (1) KCl (2) KNO_3
 (3) K_2SO_4 (4) $\text{K}_3[\text{Fe}(\text{CN})_6]$
78. Adsorption is accompanied by:
 (1) decrease in entropy of the system.
 (2) decrease in the enthalpy of the system.
 (3) decrease in Gibbs free energy.
 (4) all of these.
79. For adsorption of gas on solid surface, the plot of $\log x/m$ vs $\log P$ is linear with a slope equal to
 (1) K
 (2) $\log K$
 (3) $1/nK$
 (4) $1/n$ (n being integer)
80. Brownian movement is
 (1) Zig-zag motion of the colloidal particles
 (2) Migration of colloidal particles under the influence of electric field
 (3) Scattering of light by colloidal particles
 (4) None of these
81. Colloidal particles of soap sol in water are -
 (1) Negatively charged
 (2) Positively charged
 (3) Neutral
 (4) Unpredictable
82. Smoke is an example of-
 (1) Gas dispersed in liquid
 (2) Gas dispersed in solid
 (3) Solid dispersed in gas
 (4) Solid dispersed in solid
83. Tyndall effect in colloidal solution is due to
 (1) Scattering of light
 (2) Reflection of light
 (3) Absorption of light
 (4) Presence of electrically charged particles
84. The number of phases present in colloidal solution is:
 (1) 2
 (2) 4
 (3) 3
 (4) 1

85. Milk is a colloid in which
- (1) Liquid is dispersed in a liquid
 - (2) Solid is dispersed in a liquid
 - (3) Gas is dispersed in a liquid
 - (4) Sugar is dispersed in a liquid
- SECTION - B**
(ATTEMPT ANY 10 QUESTIONS)
86. Decreasing order of reducing power hydrogen halide is :
- (1) $\text{HI} > \text{HBr} > \text{HCl} > \text{HF}$
 - (2) $\text{HF} > \text{HI} > \text{HBr} > \text{HCl}$
 - (3) $\text{HI} > \text{HF} > \text{HBr} > \text{HCl}$
 - (4) none
87. Excess of PCl_5 and Sulphuric acid are allowed to react. The main product formed along with POCl_3 and HCl is
- (1) ClSO_2OH
 - (2) SOCl_2
 - (3) SO_2Cl_2
 - (4) S_2Cl_2
88. H_2SO_4 has very corrosive action on skin because
- (1) It acts as dehydrating agent
 - (2) It reacts with proteins
 - (3) It acts as an oxidising agent
 - (4) It acts as dehydrating agent and absorption of water is highly exothermic
89. Which of the oxides is neutral?
- (1) CO
 - (2) SnO_2
 - (3) ZnO
 - (4) SiO_2
90. The number of S-S bonds in sulphur trioxide trimer (S_3O_9) is
- (1) three
 - (2) two
 - (3) one
 - (4) zero
91. The most stable allotropic form of sulphur is:
- (1) rhombic
 - (2) monoclinic
 - (3) plastic
 - (4) milk of sulphur
92. Dolomite is a mineral of
- (1) Aluminium
 - (2) Iron
 - (3) Calcium
 - (4) Potassium
93. The product(s) obtained when KMnO_4 and HCl react together to form H_2O and Cl_2 along with:
- (1) KCl
 - (2) MnCl_2
 - (3) Both (1) & (2)
 - (4) None of the above.
94. The major role of fluorspar (CaF_2) which is added in small quantities in the electrolytic reduction of alumina dissolved in fused cryolite (Na_3AlF_6) is
- (1) that it acts as a catalyst
 - (2) to make the fused mixture very conducting
 - (3) to increase the temperature of the melt
 - (4) to decrease the rate of oxidation of carbon at the anode
95. Zr and Hf have almost equal atomic and ionic radii because:
- (1) of diagonal relationship
 - (2) of lanthanide contraction
 - (3) of actinide contraction
 - (4) both belong to same transition series
96. The critical micellization concentration (CMC) is
- (1) the concentration at which micellization begins.
 - (2) the concentration at which true solution is formed.
 - (3) the concentration at which one molar electrolyte is present per 1000 gm of solution.
 - (4) the concentration at which solute and solution form equilibrium.
97. To prevent possible coagulation caused by same amount of an electrolyte; quantities of protective colloids A, B, C and D are 2g, 1.5 g, 1 g and 1.75 g; increasing order of the gold numbers of these protective colloids will be
- (1) $C < A < B < D$
 - (2) $B < C < D < A$
 - (3) $C < B < D < A$
 - (4) $A < D < B < C$
98. Colour of colloidal solution is due to
- (1) Different size of colloidal particles
 - (2) Due to formation of complex
 - (3) Due to formation of hydrated crystal
 - (4) None of the above
99. Which of the following oxide is basic in nature?
- (1) N_2O
 - (2) P_4O_6
 - (3) As_2O_3
 - (4) Bi_2O_3
100. Which statement is correct ?
- (1) SO_2 dissolve in water & forms sulfurous acid
 - (2) SO_2 act as a bleaching agent
 - (3) SO_2 has pungent odour
 - (4) All

113. The total number of pure lines prepared by Mendel for his hybridization experiment in *Pisum Sativum* was

- (1) 14 (2) 2
(3) 7 (4) 34

114. Find the **incorrect** match w.r.t. pea plant

	Character	Trait (Dominant)	Trait (recessive)
(1)	Stem height	Tall	Dwarf
(2)	Flower position	Terminal	Axial
(3)	Flower colour	Purple	White
(4)	Pod shape	Inflated	Constricted

115. In F₂ Mendelian population of 100 pea plants, how many are expected to be pure tall?

- (1) 100 (2) 75
(3) 50 (4) 25

116. Read the following statements and choose the **correct** option

- (a) Klinefelter's Syndrome occurs due to euploidy
(b) Chromosomal aberrations are commonly observed in cancer cells
(c) Deletions and insertions of base pairs of DNA causes frame-shift mutations
(d) Chronic myelogenous leukemia occurs due to duplication of genes on a chromosome
- (1) (a) and (c) are incorrect
(2) All except (d) are correct
(3) (b) and (c) are correct
(4) All except (b) are incorrect

117. Fill up the blanks and choose the **correct** option

- (i) Skin colour inheritance in man is an example of ___[A]___ inheritance.
(ii) A cross used to ascertain whether a dominant phenotype is homozygous or heterozygous is termed ___[B]___
(iii) In ___[C]___ inheritance, maternal influence is more among the offsprings.
- (1) A – Quantitative
B – Reciprocal cross
C – Autosomal
(2) A – Monogenic
B – Out Cross
C – Extranuclear
(3) A – Polygenic
B – Test Cross
C – Cytoplasmic
(4) A – Qualitative
B – Monohybrid Cross
C – Sex linked

118. Tailoring of hnRNA is done by

- (1) Snurps
(2) Introns
(3) Exons
(4) 18S rRNA

119. Codon which can perform dual action

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

120. How many of the following statements are **correct** with respect to genetic code?

- (a) Each codon is independent and does not overlap the next codon
(b) All 64 codons code for amino acids
(c) UGG is ambiguous and degenerate codon
(d) The codon is triplet in nature
- (1) One
(2) Two
(3) Three
(4) Four

121. Which of the following bond is not found in a nucleotide of RNA?

- (1) Phosphoester bond
(2) Glycosidic bond
(3) Phosphodiester bond
(4) More than one option is correct

122. In eukaryotes, DNA replication, transcription and translation respectively occurs in

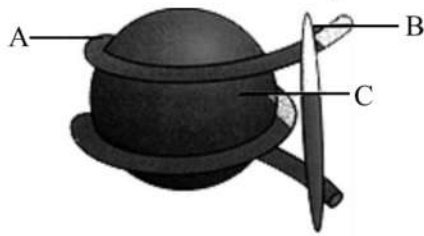
- (1) Nucleus, Nucleus, Nucleus
(2) Cytoplasm, Nucleus, Nucleus
(3) Nucleus, Nucleus, Cytoplasm
(4) Nucleus, Cytoplasm, Cytoplasm

123. Read the statements and mark them as **True** (T) or **False** (F)

- A. Rho-Factor is required for termination of transcription
B. Prokaryotic RNA polymerase produces 28 S r-RNA
C. DNA polymerase I is main polymerizing enzyme
D. In prokaryotes, DNA gyrase removes supercoils of DNA

	A	B	C	D
(1)	T	F	F	T
(2)	T	F	T	F
(3)	T	F	F	F
(4)	F	T	T	F

124. The diagram represents nucleosome. Choose the **correct** combination of labelling



	A	B	C
(1)	H1 histone	DNA	Core
(2)	DNA	H1 histone	Histone octamer
(3)	RNA	DNA	Histone octamer
(4)	DNA	Core	Histone octamer

125. If the base sequence of DNA for one strand is 5'TGCCGTAC 3', then find the base sequence of mRNA

- (1) 3' - CAUGCCGU - 5'
- (2) 5' - UGCCGUAC - 3'
- (3) 3' - UGCCGUAC - 5'
- (4) Both (1) and (2) are correct

126. Arrange the steps of DNA fingerprinting in the **correct** sequence

- I. Gel electrophoresis
- II. Hybridisation
- III. Digestion of DNA
- IV. Southern Blotting
- V. Autoradiograph

- (1) III → I → IV → II → V
- (2) II → I → IV → III → V
- (3) III → IV → II → V → I
- (4) II → III → I → V → IV

127. How many phosphodiester bonds are present in the nucleoid of *E.coli* made of 4.6×10^6 base pairs?

- (1) 4.6×10^6
- (2) 2.3×10^6
- (3) 4.6×10^{12}
- (4) 9.2×10^6

128. If a hybrid DNA molecule labelled with N^{15} is allowed to replicate twice in a normal culture medium, then the percentage of light DNA will be

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

129. If coding strand of DNA contains 5 thymidylic acids and 10 adenylic acids, the number of thymine residue and adenine residue in m-RNA will be

- (1) 5, 10
- (2) 0, 10
- (3) 10, 5
- (4) 10, 10

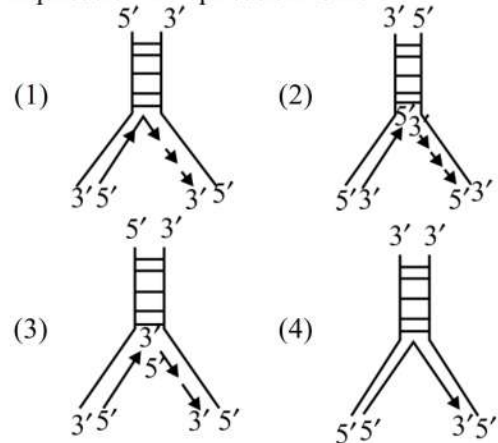
130. Heat killed S-III strain changes living R-II strain cells into virulent form by a process called

- (1) Transcription
- (2) Reverse transcription
- (3) Transformation
- (4) Translation

131. Find the **odd** one out with respect to genetic material

- (1) TMV
- (2) QB phage
- (3) $\phi \times 174$
- (4) HIV

132. Which figure is **correct** with respect to DNA replication in replication fork?



133. Which codon has no tRNA?

- (1) AUG
- (2) UUG
- (3) UAG
- (4) GAG

134. Match the columns and choose the **correct** option with respect to RNA polymerase activities

	Column-I		Column-II
(A)	5.8S rRNA	(i)	RNA pol-II
(B)	5S rRNA	(ii)	RNA pol-I
(C)	hnRNA	(iii)	RNA pol-III

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

135. Chromosome number ___A___ has most genes (2968) and chromosome ___B___ has fewest genes (231)

- (1) A → 1, B → Y
- (2) A → 1, B → X
- (3) A → X, B → Y
- (4) A → Y, B → 1

148. Which of the following bond is **not** the characteristic of a single nucleotide?

- (1) Phosphoester bond
- (2) Phosphodiester bond
- (3) Glycosidic bond
- (4) Both (2) and (3)

149. In Eukaryotes, RNA Polymerase-III catalyses the synthesis of

- (1) All rRNA and tRNA
- (2) mRNA, HnRNA and SnRNA
- (3) 5S rRNA, tRNA and SnRNA
- (4) 28S rRNA, 18S rRNA and 5S rRNA

150. Read the following statements **A** and **B** carefully and choose the **correct** option

A: The genetic code is degenerate

B: Most amino acids are coded by more than one codon

- (1) Both the statements A and B are incorrect
- (2) Statement A is correct but B is incorrect
- (3) Both the statements A and B are correct and B is the correct explanation of A
- (4) Both the statements A and B are correct but B is not the correct explanation of A

ZOOLOGY

SECTION - A

- 151.** Origin of earth dates back to-
- (1) 10,000-15000 million years ago
 - (2) 4000-4600 million years ago
 - (3) 500-1000 million years ago
 - (4) 10,000-15000 million years ago
- 152.** Who finally refuted the theory of spontaneous generation and experimentally disproved it?
- (1) Thomas Malthus
 - (2) Alfred wallace
 - (3) Louis Pasteur
 - (4) Charles Darwin
- 153.** Stanley Miller had put the Oparin-haldane theory to test in 1953 by creating in the laboratory, the probable conditions on the primitive earth. In the experiment simple amino acids were synthesized from which of the following mixtures, as observed after eighteen days?
- (1) H₂, O₂, NH₃, and H₂O
 - (2) CH₄, CN, H₂ and O₂
 - (3) H₂, NH₃, CH₄ and water vapour
 - (4) NH₃, CH₄ and O₂
- 154.** Example of genetic drift -
- (1) Genetic bottleneck effect
 - (2) Founders effect
 - (3) Directional variation
 - (4) Both (1) & (2)
- 155.** All of the following conditions were present on early earth, except-
- (1) High temperature
 - (2) Volcanic storms
 - (3) Oxidising atmosphere
 - (4) Reducing atmosphere
- 156.** Presence of NaCl in body fluid indicates that life originated in-
- (1) Primitive ocean
 - (2) Rain water lakes
 - (3) Salt solution
 - (4) All of these
- 157.** During the origin and evolution of life, key biological compounds were progressively synthesised in ocean with the help of energy obtainable from-
- (1) Lightening
 - (2) Ultraviolet light
 - (3) Lightening as well as ultra-violet light
 - (4) Combustion of certain compounds
- 158.** *Archaeopteryx* is a connecting link between-
- (1) Birds and reptiles
 - (2) Reptiles and mammals
 - (3) Annelids and arthropods
 - (4) Amphibians and fishes
- 159.** Dinosaurs were abundant in-
- (1) Jurassic period
 - (2) Devonian period
 - (3) Permian period
 - (4) Pleistocene period
- 160.** Which of the following does not illustrate the phenomenon of natural selection?
- (1) Industrial melanism
 - (2) Herbicide resistant weeds
 - (3) Artificial breeding
 - (4) Antibiotic resistant microbes
- 161.** All the following are examples of homologous organs, except-
- (1) Arm of man and flipper of whale
 - (2) Thorn of *Bougainvillea* and tendril of *Cucurbita*
 - (3) Eye of an octopus and eye of a mammal
 - (4) Brain of frog and man
- 162.** Anatomically and structurally different, but functionally similar structures are called-
- (1) Analogous
 - (2) Divergent
 - (3) Homologous
 - (4) Convergent
- 163.** Organs which have similar origin and developmental plan, but different functions are called-
- (1) Vestigial organs
 - (2) Analogous organs
 - (3) Homologous organs
 - (4) Physiological organs
- 164.** Find the odd one out w.r.t. evolution-
- (1) Seal's flipper
 - (2) Bat's wing
 - (3) Horse's foot
 - (4) Butterfly's wings
- 165.** Which of the following is a vestigial organ?
- (1) *Vermiform appendix*
 - (2) Atlas
 - (3) Premolars
 - (4) Incisors

- 166.** Hugo de Vries contribution is
- (1) Mutation Theory – on the basis of his observation on the wild variety of evening primrose (*Oenothera lamarckiana*)
 - (2) Theory of Natural Selection
 - (3) Law of Dominance
 - (4) Law of Segregation

- 167.** Presence of tail and coarse hair in human baby is-
- (1) Radiation
 - (2) Atavism
 - (3) Mutation
 - (4) Crossing over

- 168.** Unit of natural selection is
- (1) Individual
 - (2) Population
 - (3) Species
 - (4) Mutation

- 169.** The main drawback of Darwin's theory of Natural Selection was that it could not provide satisfactory explanation of
- (1) Survival of fittest
 - (2) Struggle for existence
 - (3) Mimicry
 - (4) Basis of variation and the mode of transmission of variations to the next generation

- 170.** The original birds were _____, from which the various Darwin's finches arose.
- (1) Insectivorous
 - (2) Cactus eating
 - (3) Carnivores
 - (4) Seed eating

- 171.** Which of the following is a placental mammal not marsupial?
- (1) Wombat
 - (2) Bobcat
 - (3) Bandicoot
 - (4) Tasmanian tiger cat

- 172.** Natural selection in which more individuals acquire peripheral character value at both the ends of the distribution curve is-
- (1) Stabilising natural selection
 - (2) Disruptive natural selection
 - (3) Directional natural selection
 - (4) The curve never shows the formation of two peaks

- 173.** Pelycosaurs and Therapsids were
- (1) Sauropsids
 - (2) Synapsids
 - (3) Thecodonts
 - (4) Dinosaurs

- 174.** The Neanderthal man had a cranial capacity of around
- (1) 1600 cc
 - (2) 650-800 cc
 - (3) 900 cc
 - (4) 1400 cc

- 175.** The Darwinian variations are
- (1) Small and directionless
 - (2) Random and directional
 - (3) Small and directional
 - (4) Random and directionless

- 176.** Which of the following scientists believed in the concept of natural selection like Darwin?
- (1) Lamarck
 - (2) S.L. Miller
 - (3) Alfred Wallace
 - (4) Haldane

- 177.** Ultimate source of variation is
- (1) Recombination
 - (2) Mutation
 - (3) Genetic drift
 - (4) Intermingling of two widely separated populations

- 178.** If frequency of a dominant allele, in a population which is in genetic equilibrium, is 0.6, then calculate frequency of heterozygotes in that population.
- (1) 0.4
 - (2) 0.24
 - (3) 0.48
 - (4) 0.36

- 179.** Match the following columns and choose the correct option.

	Column I		Column II
(a)	Dinosaurs suddenly disappeared	(i)	Tyrannosaurus rex
(b)	Fish like reptile	(ii)	65 mya
(c)	Dinosaur with Dagger like teeth	(iii)	Ichthyosaurs
(d)	Coelacanth fish	(iv)	350 mya

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

- 180.** Select the correct sequence w.r.t. evolution.
- (1) Chlorophyte ancestors → Dicotyledons → Seed ferns → Progymnosperms
 - (2) Progymnosperms → Seed ferns → Cycads → Rhynia type plants
 - (3) Sauropsids → Thecodonts → Therapsids → Mammals
 - (4) Psilophyton → Progymnosperms → Seed ferns → Angiosperms

181. Given below are cranial capacities and features of ancestors of modern man.

Choose the option which is not correctly describing the cranial capacity and features of the respective fossil mentioned.

(1)	Homo habilis	650-800 cc	Probably did not eat meat
(2)	Homo erectus	900 cc	Fossils discovered in 1891
(3)	Java man	900 cc	Existed around 1.5 mya
(4)	Neanderthal man	1400 cc	Lived in near east and central Africa between 1, 00,000 – 10,000 years back

182. Cave paintings by pre-historic humans can be seen at Bhimbetka rock shelter in

- (1) Andhra Pradesh
- (2) Madhya Pradesh
- (3) Uttar Pradesh
- (4) Himachal Pradesh

183. Which of the following is not an example of adaptive radiation?

- (1) Tasmanian wolf and tiger cat in Australia
- (2) Placental mole and placental mouse in Australia
- (3) Darwin's finches in Galapagos island
- (4) Lemur and spotted cuscus in Australia

184. Which theory states that life came out of decaying and rotting matter like straw, mud etc.?

- (1) Spontaneous generation theory
- (2) Theory of Biogenesis
- (3) Oparin and Haldane hypothesis
- (4) Special Creation theory

185. Continuity of germplasm' theory was given by

- (1) De Vries
- (2) Weismann
- (3) Darwin
- (4) Lamarck

SECTION - B

(ATTEMPT ANY 10 QUESTIONS)

186. Which of the following was not the connotation of special creation theory?

- (1) All living organisms that we see today were created as such
- (2) Diversity was always the same since creation
- (3) Earth is 4000 million years old
- (4) Diversity will remain same in future

187. Evolution of life forms had occurred due to use and disuse of organs, this theory was given by

- (1) French naturalist Lamarck
- (2) Hugo de Vries
- (3) Charles Darwin
- (4) Alfred Wallace

188. Choose the option that represents artificial selection by anthropogenic action.

- (1) Herbicide resistant varieties
- (2) Industrial melanism
- (3) Antibiotic resistant microbes
- (4) Breeds of dogs created by man

189. When the same structure develops along different directions due to adaptation to different needs, this is A evolution and these structures are B . Choose the option which correctly fill the blanks.

- | A | B |
|----------------|------------|
| (1) Convergent | Homologous |
| (2) Divergent | Analogous |
| (3) Divergent | Homologous |
| (4) Convergent | Analogous |

190. Embryological support for evolution proposed by Ernst Haeckel was disapproved by

- (1) Karl Ernst von Baer
- (2) Karl Landsteiner
- (3) Karl Fischer
- (4) Karl Pearson

191. Select the option which shows embryological evidence of evolution.

- (1) Fossils in different sedimentary layers
- (2) Vestigial gill slits in embryos of all vertebrates
- (3) Forelimbs of mammals
- (4) Flippers of Penguins and Dolphin

192. Which of the following statement is not applicable to replica plate experiment of Lederberg and Lederberg?

- (1) Mutation are actually pre-adaptive
- (2) Pre-adaptive mutations appear without exposure to new environment
- (3) The new environment induces mutations
- (4) The new environment only selects the pre-adaptive mutations that occurred earlier

193. Genetic drift operates in:-

- (1) Non-reproductive population
- (2) Slow reproductive population
- (3) Small isolated population
- (4) Large isolated population

- 194.** In Hardy-Weinberg equation, the frequency of heterozygous individual is represented by:-
(1) pq (2) q^2
(3) p^2 (4) $2pq$
- 195.** Gene pool is
(1) Genotype of an individual of a population
(2) Different genes of all individuals of a species found in an area
(3) Pool of artificially synthesised genes
(4) Genes of genus
- 196.** Occurrence of 4 horns instead two in goat is an example of
(1) Continuous variation
(2) Discontinuous variation
(3) Inheritable variation
(4) Acquired variation
- 197.** In a species, the weight of newborn range from 2 to 5 kg 97% of the newborn with an average weight between 3 to 3.3 kg survive whereas 99% of the infants born with weight from 2 to 2.5 kg or 4.5 to 5 kg die. Which type of selection process is taking place?
(1) Directional Selection
(2) Stabilizing Selection
(3) Disruptive Selection
(4) Cyclical Selection
- 198.** Which of the following is used as an atmospheric pollution indicator?
(1) Lepidoptera
(2) Lichens
(3) Lycopersicon
(4) Lycopodium
- 199.** Which type of selection is industrial melanism observed in moth, *Biston bitularia*?
(1) Stabilising
(2) Directional
(3) Disruptive
(4) Artificial
- 200.** Darwin believed that a giraffe has a long neck because
(1) A creator designed it that way
(2) Catastrophes eliminated short necked forms
(3) Its ancestors stretched their necks to get food
(4) Ancestral giraffes with slightly longer necks than others got more food and left more surviving

PHYSICS

ANSWERS

Section-A

1. (2)
2. (4)
3. (4)
4. (2)
5. (4)
6. (4)
7. (1)
8. (1)
9. (3)
10. (2)
11. (3)
12. (4)
13. (3)
14. (1)
15. (1)
16. (4)
17. (1)
18. (3)
19. (4)
20. (3)
21. (4)
22. (2)
23. (3)
24. (2)
25. (4)
26. (1)

27. (3)
28. (3)
29. (2)
30. (3)
31. (4)
32. (3)
33. (2)
34. (4)
35. (2)

Section-B

36. (3)
37. (1)
38. (1)
39. (2)
40. (4)
41. (2)
42. (1)
43. (3)
44. (2)
45. (3)
46. (4)
47. (1)
48. (4)
49. (2)
50. (1)

CHEMISTRY

ANSWERS

Section-A

- 51. (4)
- 52. (2)
- 53. (2)
- 54. (4)
- 55. (4)
- 56. (4)
- 57. (2)
- 58. (4)
- 59. (2)
- 60. (1)
- 61. (1)
- 62. (1)
- 63. (3)
- 64. (3)
- 65. (2)
- 66. (1)
- 67. (4)
- 68. (2)
- 69. (1)
- 70. (2)
- 71. (1)
- 72. (2)
- 73. (4)
- 74. (4)
- 75. (3)
- 76. (3)

- 77. (4)
- 78. (4)
- 79. (4)
- 80. (1)
- 81. (1)
- 82. (3)
- 83. (1)
- 84. (1)
- 85. (1)

Section-B

- 86. (1)
- 87. (3)
- 88. (4)
- 89. (1)
- 90. (4)
- 91. (1)
- 92. (3)
- 93. (3)
- 94. (2)
- 95. (2)
- 96. (1)
- 97. (3)
- 98. (1)
- 99. (4)
- 100. (4)

BOTANY

ANSWERS

Section-A

- 101. (3)
- 102. (4)
- 103. (3)
- 104. (3)
- 105. (3)
- 106. (4)
- 107. (1)
- 108. (1)
- 109. (1)
- 110. (3)
- 111. (2)
- 112. (3)
- 113. (1)
- 114. (2)
- 115. (4)
- 116. (3)
- 117. (3)
- 118. (1)
- 119. (3)
- 120. (2)
- 121. (3)
- 122. (3)
- 123. (1)
- 124. (2)
- 125. (4)
- 126. (1)

- 127. (4)
- 128. (1)
- 129. (2)
- 130. (3)
- 131. (3)
- 132. (3)
- 133. (3)
- 134. (2)
- 135. (1)

Section-B

- 136. (3)
- 137. (4)
- 138. (1)
- 139. (4)
- 140. (1)
- 141. (2)
- 142. (2)
- 143. (2)
- 144. (1)
- 145. (4)
- 146. (1)
- 147. (1)
- 148. (2)
- 149. (3)
- 150. (3)

ZOOLOGY

ANSWERS

Section-A

- 151. (2)
- 152. (3)
- 153. (3)
- 154. (4)
- 155. (3)
- 156. (1)
- 157. (3)
- 158. (1)
- 159. (1)
- 160. (3)
- 161. (3)
- 162. (1)
- 163. (3)
- 164. (4)
- 165. (1)
- 166. (1)
- 167. (2)
- 168. (1)
- 169. (4)
- 170. (4)
- 171. (2)
- 172. (2)
- 173. (2)
- 174. (4)
- 175. (3)
- 176. (3)

- 177. (2)
- 178. (3)
- 179. (1)
- 180. (4)
- 181. (4)
- 182. (2)
- 183. (4)
- 184. (1)
- 185. (2)

Section-B

- 186. (3)
- 187. (1)
- 188. (4)
- 189. (3)
- 190. (1)
- 191. (2)
- 192. (3)
- 193. (3)
- 194. (4)
- 195. (2)
- 196. (2)
- 197. (2)
- 198. (2)
- 199. (2)
- 200. (4)