# PHYSICS

(SECTION-A)

1. Three charge $2q$, $-q$, $-q$ are located at the vertices of an equilateral triangle. At the center of the triangle
(A) The field is zero but potential is non-zero
(B) The field is non-zero but potential is zero
(C) Both field and potential are zero
(D) Both field and potential are non-zero

2. Plates of area A are arranged as shown. The distance between each plate is d, the net capacitance is
(A) $\dfrac{\varepsilon_0 A}{d}$
(B) $\dfrac{7\varepsilon_0 A}{d}$
(C) $\dfrac{6\varepsilon_0 A}{d}$
(D) $\dfrac{5\varepsilon_0 A}{d}$

3. When a piece of aluminium wire of finite length is drawn through a series of dies to reduce its diameter to half its original value, its resistance will become
(A) Two times
(B) Four times
(C) Eight times
(D) Sixteen times

4. In the given figure, battery E is balanced on 55 cm length of potentiometer wire but when a resistance of 10 Ω is connected in parallel with the battery then it balances on 50 cm length of the potentiometer wire then internal resistance r of the battery is

(A) 1 Ω
(B) 3 Ω
(C) 10 Ω
(D) 5 Ω
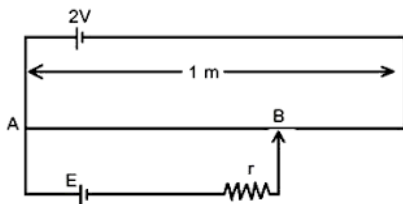
5. A wire carrying current I has the shape as shown in adjoining figure . Linear parts of the wire are very long and parallel to X-axis while semicircular portion of radius R is lying in Y-Z plane. Magnetic field at point O is
(A) $\vec{B} = -\dfrac{\mu_0}{4\pi}\dfrac{1}{R}\left(\mu\hat{i} \times \pi\hat{k}\right)$
(B) $\vec{B} = -\dfrac{\mu_0}{4\pi}\dfrac{1}{R}\left(\pi\hat{i} \times 2\hat{k}\right)$
(C) $\vec{B} = -\dfrac{\mu_0}{4\pi}\dfrac{1}{R}\left(\mu\hat{i} \times 2\hat{k}\right)$
(D) $\vec{B} = -\dfrac{\mu_0}{\pi}\dfrac{1}{R}\left(\mu\hat{i} \times 2\hat{k}\right)$

6. A charged particle moving in a magnetic field experience a resultant force
(A) In the direction of field
(B) In the direction opposite to the field
(C) In the direction perpendicular to both the field and its velocity
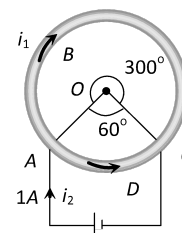(D) None of the above

7. A, B and C are parallel conductor of equal length carrying current I, I and 2I respectively. Distance between A and B is x. Distance between B and C is also x. F_1 is the force exerted by B on A and F_2 is the force exerted by C on A. Choose the correct answer
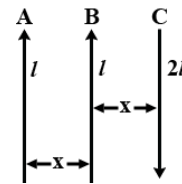
(A) $F_1 = 2F_2$
(B) $F_2 = 2F_1$
(C) $F_1 = F_2$
(D) $F_1 = -F_2$

8. A cell is connected between the points A and C of a circular conductor $ABCD$ of centre O with angle $A\,OC = 60^o$. If B_1 and B_2 are the magnitudes of the magnetic fields at O due to the currents in ABC and ADC respectively, the ratio $\dfrac{B_1}{B_2}$ is

(A) 0.2
(B) 6
(C) 1
(D) 5

9. A diamagnetic material in a magnet field moves

(A) From weaker to the stronger parts of the field

(B) Perpendicular to the field

(C) From stronger to the weaker parts of the field

(D) In none of the above directions

10. A LCR series A.C. circuit is tuned to resonance. The impedence of the circuit is now

(A) R

(B) $\left[R^2 + \left(\dfrac{1}{\omega C} - \omega L \right)^2 \right]^{\frac{1}{2}}$

(C) $\left[R^2 + (\omega L)^2 \left(\dfrac{1}{\omega C} \right)^2 \right]^{\frac{1}{2}}$

(D) $\left[R^2 + \left(\omega L - \dfrac{1}{\omega C} \right)^2 \right]^{\frac{1}{2}}$

11. If the threshold wavelength for sodium is 5420 Å, then the work function of sodium is

(A) 4.58 $e\mathcal{V}$ (B) 2.28 $e\mathcal{V}$

(C) 1.14 $e\mathcal{V}$ (D) 0.23 $e\mathcal{V}$

12. The energy of a hydrogen atom in its ground state is -13.6 e . The energy of the level corresponding to the quantum number n = 2 (first excited state) in the hydrogen atom is

(A) -2.72 $e\mathcal{V}$ (B) -0.85 $e\mathcal{V}$

(C) -0.54 $e\mathcal{V}$ (D) -3.4 $e\mathcal{V}$

13. The mass and energy equivalent to 1 *a.m.u.* respectively

(A) 1.67×10^{-27} *gm*, 9.30 *MeV*

(B) 1.67×10^{-27} *kg*, 930 *MeV*

(C) 1.67×10^{-27} *kg*, 1 *MeV*

(D) 1.67×10^{-34} *kg*, 1 *MeV*

14. Consider the junction diode as ideal. The value of current flowing through AB is
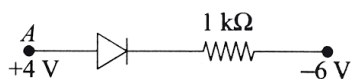
(A) 0 A   (B) 10^{-2} A

(C) 10^{-1} A   (D) 10^{-3} A

15. In a transistor if collector current is 25 mA and base current is 1 mA, then current amplification factor α is

(A) $\dfrac{25}{24}$ (B) $\dfrac{24}{25}$

(C) $\dfrac{25}{26}$ (D) $\dfrac{26}{25}$

16. Which logic is represented by following diagram

(A) AND   (B) OR

(C) NOR   (D) XOR

17. A ray of light passes from a medium A having refractive index 1.6 to the medium B having refractive index 1.5. The value of critical angle of medium A is

(A) $\sin^{-1}\left(\dfrac{16}{15} \right)$ (B) $\sin^{-1}\sqrt{\dfrac{16}{15}}$

(C) $\sin^{-1}\left(\dfrac{1}{2} \right)$ (D) $\sin^{-1}\left(\dfrac{15}{16} \right)$

18. An object has image thrice of its original size when kept at 8 cm and 16 cm from a convex lens. Focal length of the lens is

(A) 8 cm

(B) 16 cm

(C) Between 8 cm and 16 cm

(D) Less than 8 cm

19. Two coherent monochromatic light beams of intensities I and 4I are superposed. The maximum and minimum possible intensities in the resulting beam are

(A) 5I and I   (B) 5I and 3I

(C) 9I and I   (D) 9I and 3I

20. A single slit of width 0.02 mm is illuminated with light of wavelength 500 nm. The observing screen is placed 80 cm from the slit. The width of the central bright fringe will be

(A) 1 mm   (B) 2 mm

(C) 4 mm   (D) 5 mm

21. Refractive index of material is equal to tangent of polarising angle. It is called

(A) Brewster s law   (B) Lambert's law

(C) Malus's law   (D) Bragg's law

22. The value of $\left(\vec{A} + \vec{B} \right) \times \left(\vec{A} - \vec{B} \right)$ is.

(A) 0   (B) $A^2 - B^2$

(C) $\vec{B} \times \vec{A}$

(D) $2\left(\vec{B} \times \vec{A}\right)$

23. A stone dropped from the top of the tower touches the ground in 4 sec. The height of the tower is about
(A) 80m
(B) 40m
(C) 20m
(D) 160m

24. A missile is fired for maximum range with an initial velocity of 20m / s. If g = 10 m/$s2$, the range of the missile is
(A) 20m
(B) 40 m
(C) 50 m
(D) 60 m

25. An object start sliding on a frictionless inclined plane and from same height another object start falling freely
(A) Both will reach with same speed
(B) Both will reach with same acceleration
(C) Both will reach in same time
(D) None of above

26. A shell initially at rest explodes into two pieces of equal mass, then the two pieces will
(A) Be at rest
(B) Move with different velocities in different direction
(C) Move with the same velocity in opposite direction
(D) Move with the same velocity in same direction

27. Which of the following is not a perfectly inelastic collision
(A) Striking of two glass balls
(B) A bullet striking a bag of sand
(C) An electron captured by a proton
(D) A man jumping onto a moving cart

28. Moment of inertia of a ring of mass M and radius R about an axis passing through the centre and perpendicular to the plane is I. What is the moment of inertia about its diameter
(A) I
(B) $\dfrac{1}{2}$
(C) $\dfrac{1}{\sqrt{2}}$
(D) I + MR^2

29. If the radius of the earth is suddenly contracts to half of its present value, then the duration of day will be of

(A) 6 hours
(B) 12 hours
(C) 18 hours
(D) 24 hours

30. The principle of conservation of angular momentum, states that angular momentum
(A) Always remains conserved
(B) Is the product of moment of inertia and velocity
(C) Remains conserved until the toque acting on it remains constant
(D) None of these

31. The escape velocity of a planet having mass 6 times and radius 2 times as that of the earth is
(A) $\sqrt{3}V_e$
(B) 3 V_e
(C) $\sqrt{2}V_e$
(D) 2 V_e

32. A body of mass *m kg.* starts falling from a point 2*R* above the Earth's surface. Its kinetic energy when it has fallen to a point '*R*' above the Earth's surface [*R*-Radius of Earth, *M*-Mass of Earth, *G*-Gravitational Constant]
(A) $\dfrac{1}{2}\dfrac{GMm}{R}$
(B) $\dfrac{1}{6}\dfrac{GMm}{R}$
(C) $\dfrac{2}{3}\dfrac{GMm}{R}$
(D) $\dfrac{1}{3}\dfrac{GMm}{R}$

33. Young's modulus of the wire depends on
(A) Length of the wire
(B) Diameter of the wire
(C) Material of the wire
(D) Mass hanging from the

34. Blood is following at the rate of 200 cm^3s^{-1} in a capillary of cross sectional area 0.5m^2. The velocity of flow, in mms^{-1}, is
(A) 0.1
(B) 0.2
(C) 0.3
(D) 4.0

35. When a body falls in air, the resistance of the body, 3 different shapes are given. Identify the combination of air resistance which truly represents the physical situation. (The cross sectional areas are the same).
(A) 1<2<3
(B) 2<3<1
(C) 3<2<1
(D) 3<1<2

36. The coefficient of volume expansion of a liquid is $k^-49\times10^{-51}$. Calculate the fractional change in its density when the temperature is raised by 30°C.

(A) 7.5×10^{-2} (B) 3.0×10^{-2}

(C) 1.5×10^{-2} (D) 1.1×10^{-2}

37. If the molecular weight of two gases are M_1 and M_2 then at a temperature the ratio of root mean Square velocity v_1 and v_2 will be

(A) $\sqrt{\dfrac{M_1}{M_2}}$ (B) $\sqrt{\dfrac{M_2}{M_1}}$

(C) $\sqrt{\dfrac{M_1+M_2}{M_1-M_2}}$ (D) $\sqrt{\dfrac{M_1-M_2}{M_1+M_2}}$

38. When an ideal monoatomic gas is heated at constant pressure, fraction of heat energy supplied which increase the internal energy of gas, is

(A) 2/5   (B) 3/5   (C) 3/7   (D) ¾

39. In the figure, the distribution of energy density of the radiation emitted by a black body at a given temperature is shown. The possible temperature of the black body is
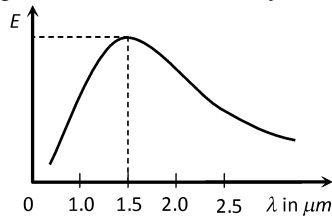
(A) 1500 K (B) 2000 K

(C) 2500 K (D) 3000 K

40. The velocity of a particle in simple harmonic motion at displacement y from mean position is.

(A) $\omega\sqrt{a^2+y^2}$ (B) $\omega\sqrt{a^2-y^2}$

(C) ωy (D) $\omega^2\sqrt{a^2-y^2}$

41. The total energy of the body executing S.H.M is E. Then the kinetic energy when the displacement is half of the amplitude, is

(A) $\dfrac{E}{2}$ (B) $\dfrac{E}{4}$

(C) $\dfrac{3E}{4}$ (D) $\dfrac{\sqrt{3}}{4}E$

42. A particle executes SHM with amplitude 0.2 m and time period 24 s. The time required for it to move from the mean position to a point 0.1 m is

(A) 2 s   (B) 3 s

(C) 8 s   (D) 12 s

43. **Assertion :** Sound waves cannot propagate through vacuum but light waves can.

Reason : Sound waves cannot be polarised but light waves can be polarised.

(A) If both assertion and reason are true and the reason is the correct explanation of the assertion.

(B) If both assertion and reason are true but reason is not the correct explanation of the assertion.

(C) If assertion is true but reason is false.

(D) If the assertion and reason both are false.

44. An object is placed 40 cm from concave mirror of focal length 20cm. The image formed is

(A) Real, inverted and same in size

(B) Real, inverted and smaller

(C) Virtual, erect and larger

(D) Virtual, erect and smaller

45. A ray of light is incident normally on one of the face of a prism of angle 30° and refractive index $\sqrt{2}$. The ngle of deviation will be

(A) 26°   (B) 0°   (C) 23°   (D) 15°

46. Two slits are separated by a distance of 0.5 mm and illuminated with light of $\lambda = 6000$ Å. If the screen is placed 2.5 m from the slits. The distance of the thired right fringe from the centre will be

(A) 1.5 mm   (B) 3 mm

(C) 6 mm   (D) 9 mm

47. Light is incident on a glass surface at polarizing angle of 57.5°. Then the angle between the incident ray and the refracted ray is

(A) 57.5°   (B) 115°

(C) 65°   (D) 205°

48. For a given velocity, a projectile has the same range R for two angles of projection if t_1 and t_2 are the time of flight in the two cases then

(A) $t_1t_2 \propto R_2$ (B) $t_1t_2 \propto R$

(C) $t_1t_2 \propto \dfrac{1}{R}$ (D)

$t_1t_2 \propto \dfrac{1}{R^2}$

49. A block is kept on a frictionless inclined surface with angle of inclination 'a'. The incline is given an acceleration 'a' to keep the block stationary. Then a is equal to


(A) g (B) g tan α
(C) g/tan α (D) g cosec α
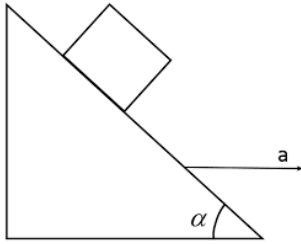
50. When two spheres of equal masses undergo glacing elastic collision with one of them at rest after collision they will move
(A) Opposite to one another
(B) In the same direction
(C) Randomly
(D) At right angle to each other

(SECTION-A)

51. The densiy of 2 M aqueous solution of NaOH is 1.28 g/cm^3. The molality of the solution is [Given that molecular mass of NaOH = 40 gmol^{-1}]

(A) 1.20 m   (B) 1.56 m

(C) 1.67 m   (D) 1.32 m

52.

$\xrightarrow{\text{Na/NH}_3(\ell)}$ P, the product can be :

(A)   (B)

(C)   (D)
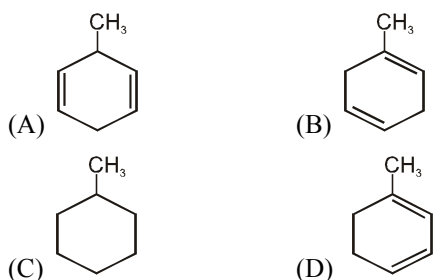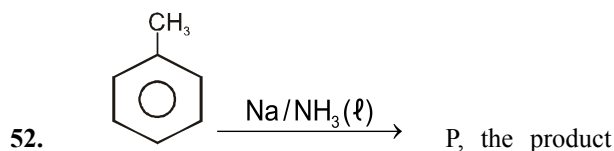
53. Consider the reactions :

(i) $(CH_3)_2$ CH– CH$_2$ Br $\xrightarrow{C_2H_5OH}$ $(CH_3)_2$ CH– CH$_2$ OC$_2$H$_5$ + HBr

(ii) $(CH_3)_2$ CH– CH$_2$ Br $\xrightarrow{C_2H_5O^-}$ $(CH_3)_2$ CH– CH$_2$ OC$_2$H$_5$ + Br $^-$

The mechanisms of reactions (i) and (ii) are respectively :

(A) S_N1 and S_N2 (B) S_N1 and S_N1

(C) S_N2 and S_N2 (D) S_N2 and S_N1

54. Consider the reaction
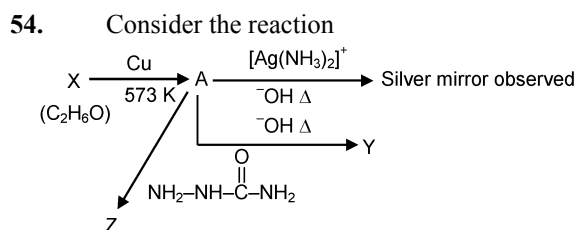
Identify A, X, Y and Z

(A) A–Methoxymethane, X–Ethanoic acid, Y–Acetate ion, Z–hydrazine.

(B) A–Methoxymethane, X–Ethanol, Y–Ethanoic acid, Z–Semicarbazide.

(C) A–Ethanal, X–Acetaldehyde, Y–But–2–enal, Z-Semicarbazone.

(D) A–Ethanol, X-Acetaldehyde, Y-Butanone, Z-Hydrazone.

55. When current passed through electrolye cation move towards cathode and anion move towads anode. If the cathode is pulled out of the solution

(A) the positive and negative ions will move towards anode

(B) the positive ions will start moving towards the anode while negative ions will stop moving

(C) the negative ions will continue to move towards anode while positive ions will stop moving

(D) the positive and negative ions will start moving randomly

56. The correct statement for the molecule, CsI$_3$, is :

(A) it is a covalent molecule.

(B) it contains Cs$^+$ and I$_3^-$

(C) it contains Cs^{3+} and I$^-$ ions.

(D) it contains Cs$^+$, I$^-$ and lattice I$_2$ molecule.

57. The decomposition of phosphine (PH$_3$) on tungsten at low pressure is a first-order reaction. It is because the

(A) Rate of decomposition is very slow

(B) Rate is proportional to the surface coverage

(C) Rate is inversely proportional to the surface coverage

(D) Rate is independent of the surface coverage

58. Consider separate solution of 0.500 M C$_2$H$_5$OH(aq), 0.100 M Mg$_3$(PO$_4$)$_2$(aq), 0.250 M KBr(aq) and 0.125 M Na$_3$PO$_4$(aq) at 25°C. Which statement is **true** about these solution, assuming all salts to be strong electrolytes ?

(A) They all have the same osmotic pressure.

(B) 0.100 M Mg$_3$(PO$_4$)$_2$(aq) has the highest osmotic pressure.

(C) 0.125 M Na$_3$PO$_4$(aq) has the highest osmotic pressure.

(D) 0.500 M C$_2$H$_5$OH(aq) has the highest osmotic pressure.

59. The most suitable reagent for the following conversion, is

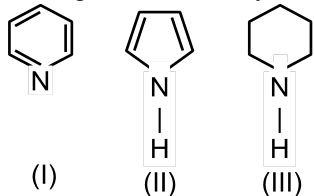$H_3C–C≡C–CH_3$ $\longrightarrow$ cis-2-butene
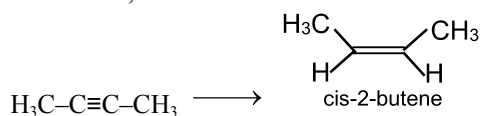
(A) Hg^{2+}/H$^+$,H$_2$O   (B) Na/liquid NH$_3$

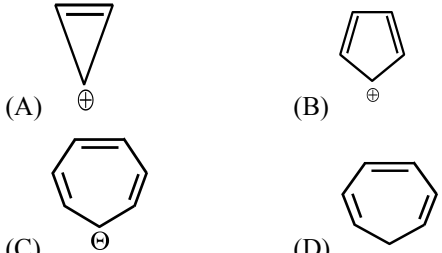(C) H$_2$,Pd/C, quinoline   (D) Zn/HCl

60. Which of the following is dependent on temperature ?
(A) Molality
(B) Molarity
(C) Mole fraction
(D) Weight percentage

61. The de-broglie wavelength associated with a ball of mass 1 kg having kinetic energy 0.5 J is.

(A) 6.626×10^{-34} m
(B) 13.20×10^{-34} m

(C) 10.38×10^{-21} m
(D) 6.626×10^{-34} Å

62. Consider the ground state of Cr atom (Z = 24). The numbers of electrons with the azimuthal quantum numbers, ℓ = 1 and 2 are, respectively
(A) 12 and 4
(B) 12 and 5
(C) 16 and 4
(D) 16 and 5

63. In which of the following arrangements the order is NOT according to the property indicated against it ?
(A) $Al^{3+} < Mg^{2+} < Na^+ < F^-$ – increasing ionic size
(B) $B < C < N < O$ – increasing first ionisation enthalpy
(C) $I < Br < F < Cl$ – increasing electron gain enthalpy (with negative sign)
(D) $Li < Na < K < Rb$ – increasing metallic radius

64. Which one of the following has a square planar geometry?
(A) $[NiCl_4]^{2-}$ (B) $[PtCl_4]^{2-}$
(C) $[CoCl_4]^{2-}$ (D) $[FeCl_4]^{2-}$
(At. no. Co = 27, Ni = 28, Fe = 26, Pt = 78)

65. Lanthanoid contraction is caused due to :
(A) the appreciable shielding on outer electrons by $4f$ electrons from the nuclear charge
(B) the appreciable shielding on outer electrons by $5f$ electrons from the nuclear charge
(C) the same effective nuclear charge from Ce to Lu
(D) the imperfect shielding on outer electrons by 4f electrons from the nuclear charge

66. The outer electron configuration of Gd (Atomic No : 64) is :
(A) $4f^3\ 5d^5\ 6s^2$
(B) $4f^8\ 5d^0\ 6s^2$
(C) $4f^4\ 5d^4\ 6s^2$
(D) $4f^7\ 5d^1\ 6s^2$

67. Which of the following species is not paramagnetic?

(A) CO (B) O_2 (C) B_2 (D) NO

68. The pair that contains two P–H bonds in each of the oxoacid is:
(A) $H_4P_2O_5$ and H_3PO_3
(B) $H_4P_2O_5$ and $H_4P_2O_6$
(C) H_3PO_2 and $H_4P_2O_5$
(D) H_3PO_3 and H_3PO_2

69. **Assertion :** SO_2 is more covalent than SeO_2
Reason : Covalent radius of Se is more than S
(A) If both assertion and reason are true and reason is the correct explanation of assertion.
(B) If both assertion and reason are true but reason is not the correct explanation of assertion.
(C) If assertion is true but reason is false.
(D) If both assertion and reason are false.

70. For a sample of perfect gas when its pressure is changed isothermally from p_i to p_f, the entropy change is given by

(A) $\Delta S = RT \ln\left(\dfrac{p_i}{p_f}\right)$

(B) $\Delta S = nR \ln\left(\dfrac{p_f}{p_i}\right)$

(C) $\Delta S = nR \ln\left(\dfrac{p_i}{p_f}\right)$

(D) $\Delta S = nRT \ln\left(\dfrac{p_f}{p_i}\right)$

71. Boric acid is an acid because its molecule
(A) Combines with proton from water molecule
(B) Contains replaceable H^+ ion
(C) Gives up a proton
(D) Accepts OH^- from water releasing proton

72. Which of the following statements is incorrect about transition elements ?
(A) The last electron enters into them in (n-1) d-orbital.
(B) Their properties are in between those of s- and p-block elements.
(C) The transition element with smallest atomic number is scandium.
(D) None of these

73. Which of the following group of transition metals is called coinage metals ?
(A) Cu, Ag, Au
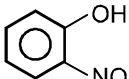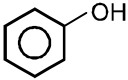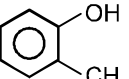(B) Ru, Rh, Pb
(C) Fe, Co, Ni
(D) Os. Ir, Pt

74. The alkane that gives only one monochloro product on chlorination with Cl_2 in precence of diffused sunlight is -
(A) 2,2,-dimethylbutane
(B) neopentane
(C) n-pentane
(D) Isopentane

75. The oxidation state of Cr in $[Cr(NH_3)_4Cl_2]^+$ is :
(A) 0   (B) +1   (C) +2   (D) +3

76. A mixture of potassium chlorate, oxalic acid and sulphuric acid is heated. During the reaction which element undergoes maximum change in the oxidation number ?
(A) S   (B) H   (C) Cl   (D) C

77. The IUPAC name for the complex $[Co(NO_2)(NH_3)_5]Cl_2$ is :
(A) Nitrito-N-pentaamminecobalt(III) chloride
(B) Nitrito-N-pentaamminecobalt(II) chloride
(C) Pentaamminenitrito-N-cobalt(II) chloride
(D) Pentaamminenitrito-N-cobalt(III) chloride

78. At 80°C , the vapour pressure of pure liquid 'A' is 520 mm Hg and that of pure liquid 'B' is 1000 mm Hg. If a mixture solution of 'A' and 'B' boils at 80° C and 1 atm pressure, the amount of 'A' in the mixture is (1 atm = 760 mm Hg)
(A) 34 mol percent   (B) 48 mol percent
(C) 50 mol percent   (D) 52 mol percent

79. Reaction of a carbonyl compound with one of the following reagents involves nucleophilic addition followed by elimination of water. The reagent is :
(A) a Grignard reagent
(B) hydrazine in presence of feebly acidic solution
(C) hydrocyanic acid
(D) sodium hydrogen sulphite

80. The hydrolysis constant of 0.5 M ammonium benzoate is 6.25×10^{-6}. The percentage hydrolysis of the salt is :
(A) 0.25   (B) 0.177
(C) 0.125   (D) 0.50

81. $Cu^+ + e^- \longrightarrow Cu$, $E° = x_1$ volt ;
$Cu^{2+} + 2e^- \longrightarrow Cu$, $E° = x_2$ volt, then for
$Cu^{2+} + e^- \longrightarrow Cu^+$, $E°$ (volt) will be -
(A) $x_1 - 2x_2$ (B) $x_1 + 2x_2$
(C) $x_1 - x_2$ (D) $2x_2 - x_1$

82. Which of the following pairs represents linkage isomers ?
(A) $[Pd(PPh_3)_2 (NCS)_2]$ and $[Pd(PPh_3)_2 (SCN)_2]$
(B) $[Co(NH_3)_5 NO_3] SO_4$ and $[Co (NH_3)_5 (SO_4)] NO_3$
(C) $[PtCl_2 (NH_3)_4 Br_2$ and $[Pt Br_2 (NH_3)_4] Cl_2$
(D) $[Cu (NH_3)_4] [Pt Cl_4]$ and $[Pt (NH_3)_4 [CuCl_4]$

83. Which of the following has highest pH ?
(A) CH_3COOK (B) Na_2CO_3
(C) NH_4Cl (D) $NaNO_3$

84. Arrange the following amines in the decreasing order of basicity :

(I) pyridine   (II) pyrrole   (III) piperidine

(A) I > III > II   (B) III > I > II
(C) III > II > I   (D) I > II > III

85. Density of a 2.05 M solution of acetic acid in water is 1.02 g/mL. The molality of the solution is
(A) 3.28 mol Kg^{-1} (B) 2.28 mol Kg^{-1}
(C) 0.44 mol Kg^{-1} (D) 1.14 mol Kg^{-1}

SECTION–B

86. The tendency of BF_3, BCl_3 and BBr_3 to behave as Lewis acid decreases in the sequence :
(A) $BCl_3 > BF_3 > BBr_3$
(B) $BBr_3 > BCl_3 > BF_3$
(C) $BBr_3 > BF_3 > BCl_3$
(D) $BF_3 > BCl_3 > BBr_3$

87. Which compound(s) out of the following is/are not aromatic?

(A) cyclopropenyl cation
(B) cyclopentadienyl cation
(C) cycloheptatrienyl anion
(D) cycloheptatriene

(A) (B)   (B) (B), (C) and (D)
(C) (C) & (D)   (D) (A) & (C)

88. Quinine is the most important alkaloid obtained from Cinchona bark. It's molecular formula is $C_{20}H_{24}N_2O_2$. It may contain

(A) 5 double bond & 6 ring
(B) 6 double bond & 4 ring
(C) 6 double bond & 3 ring
(D) 7 double bond & 5 ring

89. A reaction having equal energies of activation for forward and reverse reaction has :

(A) $\Delta G = 0$ (B) $\Delta H = 0$

(C) $\Delta H = \Delta G = \Delta S = 0$ (D) $\Delta S = 0$

90. Which one of the following is a pentose sugar ?

(A) Ribose   (B) Glocose
(C) Fructose   (D) All the three

91. In which can change in entropy is negative

(A) $2H(g) \rightarrow H_2(g)$

(B) Evaporation of water
(C) Expansion of a gas at constant temperature
(D) Sublimation of solid to gas

92. Ionisation constant of CH_3COOH is 1.7×10^{-5} and concentration of H^+ ions is 3.4×10^{-4}, Then, find out initial concentration of CH_3COOH molecules.

(A) 3.4×10^{-4} (B) 3.4×10^{-3}
(C) 6.8×10^{-4} (D) 6.8×10^{-3}

93. Red hot carbon will remove oxygen from the oxide AO and BO but not from MO, while B will remove oxygen from AO. The activity of metals A, B and M in decreasing order is

(A) $A > B > M$ (B) $B > A > M$
(C) $M > B > A$ (D) $M > A > B$

94. If the rate constant for a first order reaction is k, the time (t) required for the completion of 99% of the reaction is given by :

(A) $t = 2.303 /k$ (B) $t = 0.693 / k$
(C) $t = 6.909 /k$ (D) $t = 4.606 / k$

95. Which one of the following compound is most acidic ?

(A) $ClCH_2-CH_2OH$ (B) [benzene ring with OH and NO_2 substituents]

(C) [benzene ring with OH]   (D) [benzene ring with OH and CH_3 substituents]

96. An acidic buffer solution can be prepared by mixing solution of
(A) Ammonium acetate and acetic acid

(B) Ammonium chloride and hydrochloric acid
(C) Sulphuric acid and sodium sulphate
(D) Acetic acid and sulphuric acid

97. Boiling point of chloroform was raised by 0.323 K, when 0.5143 g of anthracene was dissolved in 35 g of chloroform. Molecular mass of anthracene is

(K_b for $CHCl_3 = 3.9$ $kg\ mol^{-1}$)

(A) 79.42 g/mol (B) 132.32 g/mol
(C) 177.42 g/mol (D) 242.32 g/mol

98. Silver nitrate is supplied in coloured bottles because it is
(A) Oxidised in air
(B) Decomposes in sunlight
(C) Explosive in sunlight
(D) Reactive towards air in sunlight

99. Match the compounds given in List I with their characteristic reactions given in List II. Select the correct option.
List I
(Compounds)
(a) $CH_3(CH_2)_3NH_2$

(b) $CH_3C \equiv CH$

(c) $CH_3CH_2COOCH_3$
(d) $CH_3CH (OH)CH_3$
List II
(Reactions)
(i) Alkaline hydrolysis
(ii) With KOH and $CHCl_3$ produces bad smell
(iii) Gives white ppt. with ammonical $AgNO_3$
(iv) With Lucas reagent cloudiness appears after 5 minutes
(A) a-(ii), b - (i), c - (iv), d- (iii)
(B) a - (iii), b - (ii), c - (i), d - (iv)
(C) a - (ii), b - (iii), c - (i), d - (iv)
(D) a - (iv), b - (ii), c - (iii), d - (i)

100. Clemmensen reduction of a ketone is carried out in the presence of which of the following ?
(A) Glycol with KOH
(B) Zn-Hg with HCl
(C) Li Al H_4
(D) H_2 and Pt as catalyst

101. **Statement A:** The word systematics is derived from the Latin word Systema which means systematic arrangement of organisms.
Statement B: Systematics involves taxonomy along with phylogeny.
(A) Only statement (A) is correct
(B) Only statement (B) is correct
(C) Both statements (A) and (B) are correct
(D) Both statements (A) and (B) an incorrect

102. Consider the following statements and state true (T) and false (F):
(1) In members of class ascomycetes and basidiomycetes, an intervening dikaryotic stage occurs.
(2) Asexual spores are commonly not found in members of class oomycetes.
(3) In sac fungi, sexual spores are produced inside Ascus.
(4) In members of class deuteromycetes, only asexual or vegetative phase are knowns.

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

103. Rhizoids of mosses are
(A) Multicellular and branched
(B) Multicellular and unbranched
(C) Unicellular and unbranched
(D) Not found in mosses

104. Funaria consists of upright slender axes bearing _____ arranged leaves
(A) Spirally
(B) Whorled
(C) Oppositely
(D) Both (B) and (C)

105. In Cycas the pinnate leaves present for a few
(A) Days   (B) Months
(C) Hours   (D) Years

106. Identify the modified structure in the given figure.

(A) Leaf tendril
(B) Axillary bud tendril
(C) Leaflet tendril

(D) Subaerial stem

107. China rose, tomato, and lemon all are common in having
(A) Axile placentation.
(B) Monadelphous condition.
(C) Polypetalous condition.
(D) Apocarpous condition.

108. Hypodermis is collenchymatous for mechanical strength in
(A) Dicot root.   (B) Monocot root.
(C) Dicot stem.   (D) Monocot stem.

109. Leaves of grasses roll and unroll due to
(A) Hormonal change.
(B) Presence of Bulliform cells.
(C) Change in turgor pressure.
(D) Change in temperature

110. Function of companion cells is:
(A) Loading of sucrose into sieve elements.
(B) Providing energy to sieve elements for active transport.
(C) Providing water to phloem
(D) Loading of sucrose into sieve elements by passive transport.

111. Closed vascular bundles lack:-
(A) Cambium
(B) Pith
(C) Ground tissue
(D) Conjuctive tissues

112. In which cell organelles, genome system is autonomous?
(A) Ribosomes and chloroplasts
(B) Mitochondria and chloroplasts
(C) Mitochondria and ribosomes
(D) Golgi bodies and ribosomes

113. Who proposed the "cell lineage theory" by stating that "Omnis cellula-e cellula"?
(A) Karl Nageli   (B) Schleiden
(C) Robert Brown   (D) Rudolf Virchow

114. Read the following statements:
(I) It contains water, sap and excretory product.
(II) It is bounded by a single membrane.
(III) Its content forms cell sap.
(IV) It maintains the turgidity of the cell.
The above features are attributed to
(A) Lysosome   (B) Vacuole

(C) Nucleolus   (D) Peroxysome

115. Which of the following stages of meiosis involves division of centromere?
(A) Metaphase I   (B) Metaphase II
(C) Anaphase II   (D) Telophase

116. An anaphase chromosome contains
(A) 1 DNA molecule
(B) 3 DNA molecules
(C) 2 DNA molecules
(D) 4 DNA molecules

117. Period of active mitosis ranges from
(A) 10 minutes to a few hours
(B) A few hours to one day
(C) One day to a week
(D) Less than a minute

118. Anaphase I and anaphase II are different from each other because of
(A) Orientation of spindle fibre
(B) Composition of spindle fibre
(C) Velocity of movement of chromatids
(D) All of these

119. When synapsis is complete all along the chromosome, the cell is said to have entered a stage called:
(A) Zygotene   (B) Pachytene
(C) Diplotene   (D) Diakinesis

120. Chlorophyll in chloroplasts is located in:
(A) grana
(B) pyrenoid
(C) stroma
(D) both grana and stroma

121. A process that makes important difference between C_3 and C_4 plants is:-
(A) Photosynthesis
(B) Photorespiration
(C) Transpiration
(D) Glycolysis

122. Which of the following statements is true with regard to the light reaction of photosynthesis?

(A) In PS-II the reaction centre chlorophyll− a has an absorption peak at 700 nm, hence is called $P7_{00}$.

(B) In PS-I the reaction centre chlorophyll− a has an absorption maxima at 680 nm and is called P_{680}.

(C) The splitting of water molecule is associated with PS-I

(D) Photosystem-I and II are involved in Z scheme

123. Statement A: PS II is located in the appressed region of grana thylakoid.
Statement B: PS II absorbs light of 680 nm of visible spectrum.
Select the correct option.
(A) Only (A) is correct.
(B) Only (B) is correct.
(C) Both (A) and (B) are correct.
(D) Both (A) and (B) are incorrect

124. Total yield in one Kerb cycle:

(A) 3 $FADH_2$, 2 $NADH_2$, 1 ATP

(B) 2 $FADH_2$, 2 $NADH_2$, 2 ATP

(C) 2 $NADH_2$, 1 $FADH_2$, 2 ATP

(D) 3 $NADH_2$, 1 $FADH_2$, 1 ATP

125. Which of the following justifies the amphibolic nature of respiratory pathway rather than a purely catabolic one?
(A) Succinyl-CoA----Succinic acid
(B) Citrate--- cis----Aconitate
(C) Oxalosuccinate-a-Ketoglutarate
(D) Oxaloacetic acid----Alkaloids

126. What is the site of perception of photoperiod necessary for induction of flowering in plants?
(A) Lateral buds   (B) Pulvinus
(C) Shoot apex   (D) Leaves

127. The process of growth is maximum during
(A) Dormancy   (B) Log phase
(C) Lag phase   (D) Senescence

128. Ethylene is used for:
(A) Decrease the senescence
(B) Increase the heights of stem
(C) Ripening of fruits
(D) Prevention of leaf fall

129. Which of the following is not a structural part of pistil?
(A) Stigma   (B) Ovary
(C) Style   (D) Connective

130. Polyembryony was reported by
(A) P. Maheshwari   (B) Leeuwenhoek
(C) Memek   (D) A. K. Singh

131. Which one of the following pairs of plant structures has haploid number of chromosomes?
(A) Nucellus and antipodal cells
(B) Egg nucleus and secondary nucleus
(C) Megaspore mother cell and antipodal cells
(D) Egg cell and antipodal cells

132. In pea plants, yellow seeds are dominant to green. If a heterozygous yellow seeded plant is crossed with a green seeded plant, what ratio of yellow and green seeded plants would you expect in F_1 generation:-
(A) 50: 50   (B) 9: 1
(C) 1: 3   (D) 3: 1

133. Segregation of genes take place during:
(A) Metaphase
(B) Anaphase
(C) Prophase
(D) Embryo formation

134. Represented below is the inheritance pattern of a certain type of traits in humans. Which one of the following conditions could be an example of this pattern?
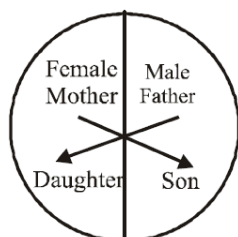
(A) Haemophilia
(B) Thalassemia
(C) Phenylketonuria
(D) Sickle cell anaemia

135. Complete the table by identifying A, B and C with respect to characters and their contrasting traits studied by Mendel:

Characters	Contrasting traits
Flower colour	Violet/A
Pod colour	Green/B
Seed colour	Yellow/C

	A	B	C
(A)	White	Yellow	Green
(B)	Red	Yellow	Green
(C)	White	Yellow	White
(D)	Red	Brown	White

SECTION-B

136. Choose the incorrect option w.r.t. blood grouping:

	Blood group of parents	Genotype of progeny may be	Phenotype of progeny
(A)	A × B	$I^\circ I^\circ$	O
(B)	AB × O	$I^A I^B$	AB
(C)	B × B	$I^\circ I^\circ$	O
(D)	AB × B	$I^A I^\circ$	A

137. Read the following statement with respect to the structure of DNA, and state true (T) or false (F).
(A) It is made up of two polynucleotide chains that have antiparallel polarity.
(B) The two chains are coiled in a right-handed fashion.
(C) Phosphate group is linked to 5'-OH of the same nucleoside by glycoside linkage for the formation of sugar phosphate backbone.
(D) All four deoxyribonucleotides are always equally present in both the strands.
(A) A – T; B – T; C – F; D – F
(B) A – T; B – T; C – T; D – F
(C) A – F; B – F; C – T; D – T
(D) A – T; B – F; C – F; D – T

138. Read the following statements, and select the correct option.
A. Packaging of chromatin at higher level requires additional set of proteins that collectively are referred to as non-histone chromosomal proteins.
B. Heterochromatin is transcriptionally active.
(A) Only (A) is correct.
(B) Only (B) is correct.
(C) Both (A) and (B) are correct.
(D) Both (A) and (B) are incorrect

139. _____ codes for methionine and . it also acts as initiator codon?
(A) GUU   (B) AUG
(C) UAA   (D) UUU

140. Human Genome Project (HGP) was closely associated with the rapid development of a new area in biology known as
(A) Biotechnology
(B) Bioinformatics
(C) Biolistics

(D) Genetic Engineering

141. RNA polymerase I transcribes all, except
(A) hnRNA (B) snRNA
(C) tRNA (D) 5S rRNA

142. Antiparallel strand in DNA is due to :-
(A) Disulphide linkage
(B) Hydrogen bond
(C) Phosphodiester bond
(D) Ionic bond

143. Find out the true (T) or false (F) statements and choose the correct option:
(i) With the repeated use of drugs/alcohol, the tolerance level of the receptors in our body increases; as a result, receptors respond only to higher doses of drugs/alcohol leading to greater intake and addiction.
(ii) Addiction is a psychological attachment to certain effects, such as euphoria and temporary feeling of well being, associated with drugs and alcohol.
(iii) Dependence is the tendency of the body to manifest a characteristic and unpleasant withdrawal syndrome if regular dose of drugs/alcohol is discontinued.
(iv) The adverse effects of drugs and alcohol abuse are manifested in the form of reckless behaviour, vandalism and violence.

	(i)	(ii)	(iii)	(iv)
(A)	T	T	T	F
(B)	T	T	T	T
(C)	F	T	T	T
(D)	T	T	F	T

144. Match column (A) with (II), and choose the correctcombination.

Column I	Column II
A. Bacteria	(i) Citric acid
B. Fungi	(ii) Acetic acid
	(iii) Lactic acid
	(iv) Ethanol
	(v) Butyric acid

(A) A - (i), (ii) (iii), (v); B(iv)
(B) A(ii), (iii), (v); B - (i) , (iv)
(C) A - (i) (iv); B(ii), (iii), (v)
(D) A (iv), (v); B - (i) (ii), (iii)

145. The migratory birds that are seen in Keoladeo National Park during winter come from
(A) Extremely hot southern regions
(B) Extremely cold northern regions
(C) Gulf regions
(D) Extremely hot northern regions

146. Humus is formed in :
(A)Horizon-A (B) Horizon-O

(C)Horizon-B (D) Horizon-C

147. Which of the following upright or inverted? Ecological pyramids may be
A. Pyramid of energy
B. Pyramid of number
C. Pyramid of biomass
(A) Only (A) and (B)
(B) Only (B)
(C) Only (B) and (C)
(D) All (A), (B), and (C)

148. The detritus food chain has all the following characteristics, except
(A) The source of energy is detritus.
(B) Inclusion of decomposers, transducers, and saprotrophs.
(C) Occurrence of heterotrophic organisms.
(D) It is the main conduit for energy flow in terrestrial ecosystem.

149. Biotic factors are :
(A)Chemical factors of soil which affect life
(B) Physical factors of soil which affect life
(C) All living organisms which influence otherorganisms
(D) Factors of atmosphere which affect life

150. India is one of the 'twelve' megadiversity countries with _____ of genetic resources of the world:
(A)12.1% (B) 18.1%
(C) 38.1% (D) 8.1%

ZOOLOGY (SECTION-A)

151. Metameric segmentation is the characteristic of
(A) Mollusca and Choradata
(B) Platyhelminthes and Arthropoda
(C) Echinodermata and Annelida
(D) Annelida and Arthropoda

152. Biological organisation starts with:-
(A) Atomic level
(B) Submicroscopic molecular level
(C) Cellular level
(D) Organismic level

153. Select the correct statements with reference to chordates.
A. Presence of a mid-dorsal, solid and double nerve cord.
B. Presence of closed circulatory system.
C. Presence of paired pharyngeal gill slits.
D. Presence of dorsal heart
E. Triploblastic pseudocoelomate animals.
Choose the correct answer from the options given below:
(A) A, C and D only (B) B and C only

(C) B, D and E only   (D) C, D and E only

154. The chief excretory waste of insects is
(A) Urea
(B) Uric acid
(C) Ammonia
(D) Ornithuric acid

155. Rana tigrina
(A) is ureotelic
(B) has mesonephric kidney
(C) has uriniferous tubules in kidney
(D) has all of the above characters

156. Choose the correctly matched pair:

(A) Tendon - Specialized connective tissue

(B) Adipose tissue - Dense connective tissue

(C) Areolar tissue - Loose connective tissue

(D) Cartilage - Loose connective tissue

157. A long refractory period is found in

(A) Muscles of stomach

(B) Cardiac muscles

(C) Red skeletal muscle

(D) White skeletal muscle

158. Which of the following secondary metabolites are used as pigments?
(i) Carotenoids   (ii) Ricin
(iii) Morphine   (iv) Anthocyanin
(v) Abrin   (vi) Rubber
(A) (i) and (v)   (B) (ii) and (vi)
(C) (i) and (iv)   (D) (iii) and (v)

159. Select the incorrect match.

(A) Trypsin−Enzyme

(B) Collagen−Intracellular ground substance

(C) Insulin−Hormone

(D) Antibody−Defence against infections

160. Purines found both in DNA and RNA are
(A) Adenine and thymine
(B) Adenine and guanine
(C) Guanine and cytosine
(D) Cytosine and thymine

161. Respiratory centre in brain occurs in:-
(A) Medulla oblongata   (B) Cerebellm

(C) Hypothalamus   (D) Pericardium

162. Read the following statement:
(i) Pulmonary volumes are measured using a spirometer.
(ii) The vital capacity of our lungs is IC + ERV.
(iii) The volume of air present in the lungs at the end of forceful expiration is functional residual capacity (FRC).
(iv) Inspiratory reserve volume cannot be measured by spirometer.
Which of the above statements are correct?
(A) (i) and (ii)   (B) (ii) and (iii)
(C) (iii) and (iv)   (D) (i) and (iv)

163. Read the following statements and choose the correct option:
Statement I: The movement of air into and out of lungs is carried out by creating a pressure gradient between lungs and the atmosphere.
Statement II: Expiration occurs when the intrapulmonary pressure is higher than the atmospheric pressure.
(A) Both statements are correct.
(B) Only statement I is correct.
(C) Only statement II is correct.
(D) Both statements are incorrect.

164. Adult human RBCs are enucleated. 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
(A) Only I   (B) I, III and IV
(C) II and III   (D) Only IV

165. 72 beat per minute heart beat rate of man is controlled by:-
(A) SA-node   (B) Ventricles
(C) Purkinje fibers   (D) AV-node

166. Which one of the following is correct?
(A) Serum = Blood + Fibrinogen
(B) Lymph = Plasma + RBC + WBC
(C) Blood = Plasma + RBC + WBC + Platelets
(D) Plasma = Blood − Lymphocytes

167. Which of the following hormone is responsible for facultative reabsorption of water from the distal parts of nephron ?
(A) Renin
(B) Rennin
(C) Vasopressin

(D) Atrial natriuretic factor

168. Tubular reabsorption of water is minimum in
(A) Collecting duct
(B) Henle's loop
(C) Proximal convoluted tubule
(D) Distal convoluted tubule

169. Identify the wrong statement:
(A) Krebs Henseleit takes place in liver.
(B) Each gram of ammonia requires 500 ml water for its removal.
(C) Ammonia is the preferred excretory waste of animals laying shelled eggs.
(D) In humans, uric acid is formed by breakdown of purines.

170. Pelvic girdle of rabbit consists of:-
(A) Ilium, ischium and pubis
(B) Ilium, ischium and coracoid
(C) Coracoid, scapula and clavicle
(D) Ilium, coracoid and scapula

171. Saddle joint occurs between
(A) Carpal and first metacarpal
(B) Femur and pelvic girdle
(C) All the vertebrae
(D) Phalanges

172. Nissl's granules are:
(A) RNA bodies   (B) DNA
(C) carbohydrate   (D) protein

173. Which part of the brain is affected first in a drunk person:
(A) Cerebrum
(B) Olfactory lobe
(C) Cerebellum
(D) Medulla oblongata

174. During the transmission of nerve impulse through a nerve fibre, the potential on the inner side of the plasma membrane has which type of electric charge ?
(A) First negative, then positive and again back to negative
(B) First positive, then negative and continue to be negative
(C) First negative, then positive and continue to be positive
(D) First positive, then negative and again back to positive.

175. Hormone responsible for the secretion of milk after parturition is:
(A) ACTH   (B) LH
(C) ICSH   (D) Prolactin

176. A temporary endocrine gland in the human body is:
(A) Corpus cardiacum   (B) Corpus luteum

(C) Corpus allatum   (D) Pineal gland

177. LH and FSH are collectively called:
(A) Oxytocin   (B) Somatotrophins
(C) Luteotrophic   (D) Gonadotrophins

178. Mammalian thymus is mainly concerned with:
(A) Regulation of body temperature
(B) Regulation of body growth
(C) Immunological functions
(D) Secretion of thyrotropin

179. Which of the following hormones stimulates follicular development as well as secretion of estrogen by growing follicle?
(A) LH   (B) Progesterone
(C) FSH   (D) Estrogen

180. The primary cause of the sloughing of endometrium accompanied by bleeding is
(A) Rupturing of follicle
(B) Surge in levels of LH and FSH
(C) Degeneration of corpus luteum
(D) Formation of Graafian follicle

181. Surgical removal or cutting and ligation of the ends of oviduct is known as:
(A) tubectomy   (B) Oviductomy
(C) Castration   (D) Vasectomy

182. Read the following statements:
A. Vasa efferentia are lined by motile cilia.
B. The failure in descend of testis is called cryptorchidism.
C. In females, labia minora fuses posteriorly to form a membranous fold called perineum.
D. The narrow end of oviduct that joins uterus is called infundibulum. Which of the statements are correct?
(A) (A) and (B)   (C) (C) and (D)
(B) (B) and (C)   (D) (A) and (D)

183. Which of the following cannot be detected in a developing foetus by amniocentesis?
(A) Klinefelters syndrome
(B) Sex of the foetus
(C) Down syndrome
(D) Jaundice

184. Artificial insemination means
(A) Transfer of sperms of a healthy donor to a test tube containing ova
(B) Transfer of sperms of husband to a test tube containing ova
(C) Artifical introduction of sperms of a healthy donor into the vagina
(D) Introduction of sperms of healthy donor directly into the ovary

185. Which hormone is mainly not involved in the process of menstrual cycle
(A) Progesterone (B) Relaxin
(C) FSH (D) LH

SECTION-B

186. Which of the following is a correct flowchart with respect to evolution of mammals?

(A) Synapsids → Pelycosaurs → Therapsids → Mammals

(B) Sauropsids → Synapsids → Thecodont → Mammals

(C) Therapsids → Pelycosaurs → Synapsids → Mammals

(D) Therapsids → Synapsids → Pelycosaurs → Mammals

187. Find the true (T) and false (F) statements, and choose the correct option.
(i) Darwin said that variations, which are heritable and which make resource utilisation better for few, will enable only those to reproduce and leave more progeny.
(ii) Formation of new microbial species requires very little time but for something to happen in a fish/fowl would take millions of years, since they have much longer life spans.
(iii) According to Lamarckism, long-necked giraffes evolved because nature selected only long-necked animals.
(iv) Most modern breeds of dogs have evolved through artificial selection.

	A	B	C	D
(A)	T	T	T	T
(B)	T	T	F	T
(C)	F	T	F	T
(D)	F	F	F	T

188. Ringworm infections are caused by
(i) Microsporum
(ii) Epidermophyton
(iii) Trichophyton
(iv) Trichomonas vaginalis
(A) (i), (ii) and (iii)
(B) (ii), (iii) and (iv)
(C) (i) and (iv)
(D) (ii) and (iv)

189. The drugs that alter a person's thought, feeling and perception can be obtained from all, except
(A) Datura
(B) Claviceps purpurea
(C) Cannabis sativa
(D) Papaver somniferum

190. Which of the following vaccine is prepared by recombinant DNA technology, using transgenic yeast?
(A) Polio vaccine
(B) Hepatitis B vaccine
(C) MMR vaccine
(D) BCG vaccine

191. Stirred tank bioreactors are designed for
(A) Addition of preservatives to the product.
(B) Purification of product.
(C) Availability of oxygen throughout the process.
(D) Ensuring anaerobic conditions in the culture vessel.

192. Bioreactors can be thought of as vessels in which
(A) Raw materials are biologically converted into specific products.
(B) Small volumes of cultures are processed.
(C) DNA amplification takes place.
(D) Transformants are distinguished due to blue-white selection.

193. The vector commonly genome is used for sequencing human
(A) YAC. (B) Plasmid.
(C) M13 phage. (D) Cosmid.

194. Which of the following is not a cloning vector?
(A) BAC (B) YAC
(C) pBR322 (D) Probe

195. Lambda phage vectors allow cloning of DNA fragments up to
(A) 45 kb (B) 23 kb
(C) 10 mb (D) 300 kb

196. A giant rat is formed in the laboratory, what is the reason :–
(A) Gene mutation (B) Gene synthesis
(C) Gene manipulation (D) Gene replicat

197. The first clinical gene therapy was given for treating :
(A) Rheumatoid arthritis
(B) Adenosine deaminase deficiency
(C) Diabetes mellitus
(D) Chicken pox

198. Study the following statements and select the option with incorrect ones.
(i) Hirudin is an anticoagulant produced from transgenic Brassica napus.
(ii) Twenty-five recombinant therapeutics worldwide have been approved for human use.
(iii) Twelve recombinant therapeutics are being marketed in India.
(iv) Bt toxins are extracellular crystalline proteins.

(v) Transgenic food may cause toxicity and produce allergy in human beings.

(A) (ii) and (iv)

(B) (ii) and

(C) (iii) and (iv)

(D) (ii) only

199. Which of the following is incorrect?

(A) Molly was the first sheep to be cloned.

(B) The DNA of fluorescent jellyfish was introduced in a transgenic monkey ANDi.

(C) Transgenic animals are being developed to generate biological products for treating diseases such as emphysema and phenylketonuria.

(D) Transgenic animals have been used to test toxicity of drugs.

200. Which of the following represent maximum number of species among global biodiversity?

(A) Mosses and ferns

(B) Algae

(C) Lichens

(D) Fungi