MM : 720 **Time : 3 hrs. 20 min**

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MOCK TEST
for
NEET-2023

Instructions:

(i) There are two sections in each subject, i.e. Section-A & Section-B. You have to attempt all 35 questions from Section-A & only 10 questions from Section-B out of 15.

(ii) Each question carries 4 marks. For every wrong response 1 mark shall be deducted from the total score. Unanswered / unattempted questions will be given no marks.

(iii) Use blue/black ballpoint pen only to darken the appropriate circle.

(iv) Mark should be dark and completely fill the circle.

(v) Dark only one circle for each entry.

(vi) Dark the circle in the space provided only.

(vii) Rough work must not be done on the Answer sheet and do not use white-fluid or any other rubbing material on the Answer sheet.

[PHYSICS]

Choose the correct answer :

SECTION-A

1. Water falls from a height of 60 m at the rate of 10 kg/s to operate a turbine. The losses due to frictional forces are 20% of the input energy. The power generated by the turbine is (g =10 m/s^2)

   (1) 4.8 W

   (2) 4.8 kW

   (3) 2.4 kW

   (4) 6 kW

2. Match Column-I and Column-II and choose the correct match from the given choices

	Column-I		**Column-II**
(A)	Moment of inertia of uniform ring (M, R) about an axis passing through centre and normal to its plane	(P)	$\frac{2}{5}MR^2$

(B)	Torque about the origin due to a force $\vec{F}$ applied at a point having position vector $\vec{r}$	(Q)	MR^2
(C)	Work done by a force $\vec{F}$ in displacing a body by $\vec{S}$	(R)	$\vec{r} \times \vec{F}$
(D)	Moment of inertia of a uniform solid sphere (*M*, *R)* about an axis passing through its diameter	(S)	$\vec{F} \cdot \vec{S}$

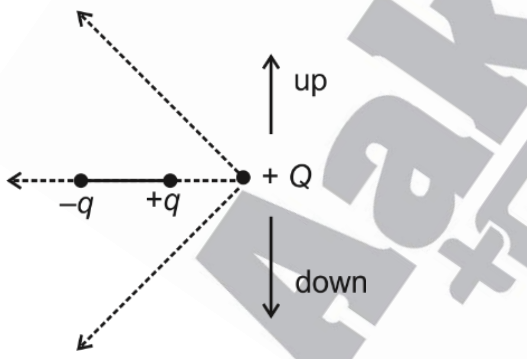
(1) A → P, B → Q, C → R, D → S

(2) A → Q, B → S, C → R, D → P

(3) A → P, B → S, C → R, D → Q

(4) A → Q, B → R, C → S, D → P

3. An electric dipole is released in an electric field produced due to a positive point charge (+*Q*) as shown in the figure. The dipole will move



(1) Towards right

(2) Towards left

(3) Upwards

(4) Downwards

4. Consider the following statements (A) and (B) and identify the correct answer.

(A) Zener diode can be used as voltage regulator.

(B) In unbiased p-n junction, at thermal equilibrium, drift current is equal to diffusion current.

(1) A is correct but B is incorrect

(2) Both A and B are correct

(3) A is incorrect but B is correct

(4) Both A and B are incorrect

5. A particle is released from height *h* above the ground. At a certain height, its kinetic energy is two times its potential energy. The speed of the particle at this instant is

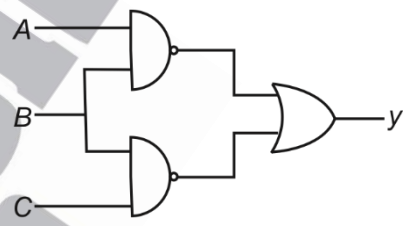
(1) $\sqrt{2gh}$

(2) $\sqrt{\frac{2gh}{3}}$

(3) $\sqrt{3gh}$

(4) $\sqrt{\frac{4gh}{3}}$

6. For the given logic diagram, the output y is given as



(1) $A + B + C$

(2) $\overline{A+B+C}$

(3) $\overline{A \cdot B \cdot C}$

(4) ABC

7. On rounding off the number 4.645 upto three significant figures, result is

(1) 4.64

(2) 4.65

(3) 4.63

(4) 4.60

8. If the dimensional formula of a physical quantity is given as $[M^pL^qT^r]$, then physical quantity will be

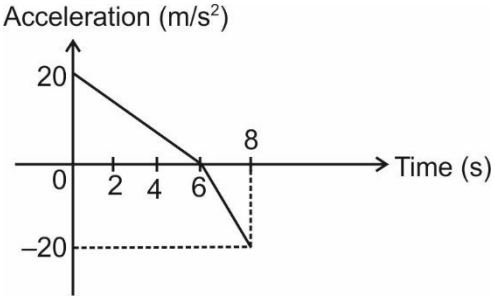
(1) Strain if, $p = 0, q = 0, r = -1$

(2) Stress if, $p = 1, q = 1, r = 2$

(3) Force if, $p = 1, q = 2, r = -2$

(4) Surface tension if, $p = 1, q = 0, r = -2$

9. The acceleration-time graph for a particle moving along *x*-axis is shown in the figure. The initial velocity of the particle is 2 m/s, then the change in the velocity of particle from $t = 0$ to $t = 8$ s is



(1) 42 m/s

(2) 38 m/s

(3) 40 m/s

(4) 20 m/s

10. Eight drops of same size are charged at 110 V each. They combine to form a bigger drop. The ratio of potentials of bigger to each small drop will be

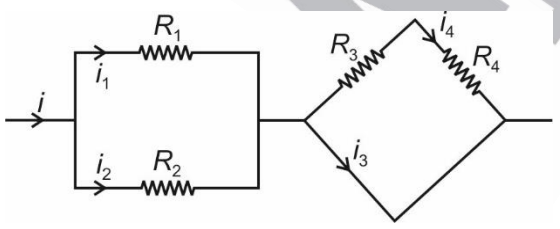
(1) 4

(2) 2

(3) 3

(4) 1

11. Four resistors having finite resistances R_1, R_2, R_3 and R_4 are connected as shown in the figure. The ratio $\frac{i_4}{i_2}$ of currents, is



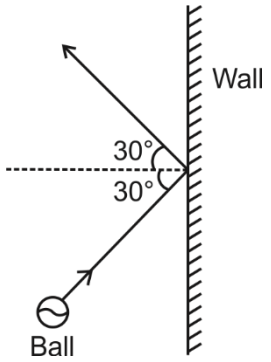
(1) $\frac{R_1}{R_1+R_2}$

(2) $\frac{R_4}{R_4+R_2}$

(3) $\frac{R_3}{R_4+R_3}$

(4) Zero

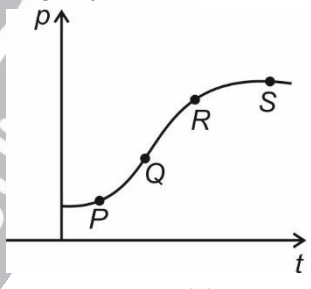
12. A ball of mass 5 kg, moving with 20 m/s, strikes a wall at an angle 30° as shown in the figure. The ball remains in the contact with the wall for 0.01 s and then rebounds with same speed. The average force exerted by the ball on the wall is



(1) $100\sqrt{3}$ kN (2) $1000\sqrt{3}$ kN

(3) $10\sqrt{3}$ kN (4) $\sqrt{3}$ kN

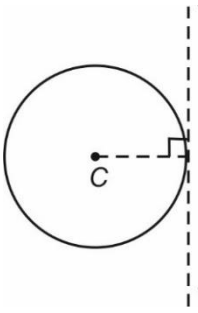
13. The variation of momentum (p) with time (t) for one of the body in two body collision is shown in the figure. The instantaneous force is maximum corresponding to point



(1) *P* (2) *Q*

(3) *R* (4) *S*

14. A thin wire of length *L* and uniform linear mass density λ is bent into a circular loop (in *xy* plane) with centre *C* as shown in the figure. The moment of inertia of the loop about axis *YY′* is



(1) $\frac{\lambda L^3}{2\pi^3}$ (2) $\frac{3\lambda L^3}{8\pi^2}$

(3) $\frac{3\lambda L^2}{8\pi^2}$ (4) $\frac{5\lambda L^3}{8\pi^2}$

15. The escape velocity of a body on the surface of an imaginary planet which has thrice the radius as of earth and double the mass of earth, is (v_e is the escape velocity at the surface of earth)

(1) $\frac{\sqrt{2}}{3}v_e$

(2) $\frac{\sqrt{3}}{2}v_e$

(3) $\sqrt{\frac{2}{3}}v_e$

(4) $\sqrt{\frac{3}{2}}v_e$

16. The sleepers are used below the rails

(1) To increase the cross-sectional area

(2) To decrease the cross-sectional area

(3) To reduce the pressure due to weight of train on rails

(4) Both (1) and (3)

17. The vertical sections of four wings moving horizontally in air is shown in the options. In which case is the force upwards?

(1) 

(2) 

(3) 

(4) 

18. A uniform magnetic field of 1.5 T exists in a cylindrical region of radius 10 cm. Its direction is parallel to axis from east to west. A wire carrying current 5 A in the north to south direction passes through this region. What is the magnitude and direction of the force on the wire, if the wire intersects the axis?

(1) 1.5 N, upwards

(2) 2.5 N, upwards

(3) 1.5 N, downwards

(4) 2.5 N, downwards

19. Which among the following have negative susceptibility?

(1) Calcium

(2) Aluminium

(3) Bismuth

(4) Iron

20. Current in a coil falls from 5.0 A to 1.0 A in 0.1 s. If an average emf of 200 V is induced, then self-inductance of the coil is

(1) 4 H (2) 5 H

(3) 2 H (4) 10 H

21. Which among the following represents the expression of displacement current during charging of a capacitor? (Symbols have their usual meaning)

(1) $C\frac{dV}{dt}$ (2) $\varepsilon_0\frac{d\phi_E}{dt}$

(3) $\varepsilon_0 A\left(\frac{dE}{dt}\right)$ (4) All of these

22. A series LCR circuit containing 4 H inductor, 100 μF capacitor and 40 Ω resistor is connected to 220 V variable frequency ac source. The frequency of source at which power transferred to the circuit is half the power at resonant angular frequency is nearly

(1) 45 rad/s

(2) 55 rad/s

(3) 50 rad/s

(4) Both (1) and (2)

23. Column-I contains certain physical quantities and Column-II contains mathematical relations. Symbols used have their usual meaning. Match the Column-I and Column-II.

	Column-I		**Column-II**
(A)	Young's modulus	(P)	$\frac{FL}{A\Delta L}$
(B)	Bulk modulus	(Q)	$-\left(\frac{\Delta R/R}{\Delta L/L}\right)$
(C)	Poisson's ratio	(R)	$-\frac{V\Delta P}{\Delta V}$
(D)	Compressibility	(S)	$-\frac{\Delta V}{V\Delta P}$

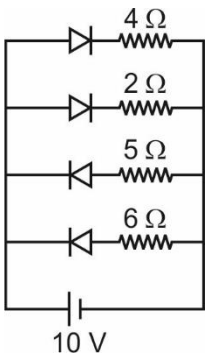
(1) A $\rightarrow$ P, B $\rightarrow$ Q, C $\rightarrow$ R, D $\rightarrow$ S

(2) A $\rightarrow$ P, B $\rightarrow$ R, C $\rightarrow$ S, D $\rightarrow$ Q

(3) A $\rightarrow$ P, B $\rightarrow$ R, C $\rightarrow$ Q, D $\rightarrow$ S

(4) A $\rightarrow$ Q, B $\rightarrow$ P, C $\rightarrow$ S, D $\rightarrow$ R

24. The current through 2 Ω resistor is



(1) 2.5 A (2) 5.0 A
(3) 7.5 A (4) Zero

25. The De Broglie wavelength λ associated with electrons accelerating through potential difference of 54 V is
(1) 0.167 nm (2) 1.227 nm
(3) 0.613 nm (4) 0.286 nm

26. Electric potential at a point $P(x, y, z)$ is $V = (x + y + z)$ V. The electric field at that point is
(1) $-(x\hat{i} + y\hat{j} + z\hat{k})$ V/m
(2) $-(\hat{i} + \hat{j} + \hat{k})$ V/m
(3) $-(x^2\hat{i} + y^2\hat{j} + z^2\hat{k})$ V/m
(4) $(\hat{i} + \hat{j} + \hat{k})$ V/m

27. A nucleus with mass number 220 initially at rest emits an α-particle. If the Q value of reaction is 11 MeV, then kinetic energy of the α-particle is nearly
(1) 10.8 MeV (2) 0.2 MeV
(3) 5.5 MeV (4) 9.8 MeV

28. The energy of an electron in the n^{th} Bohr's orbit is proportional to
(1) n^2 (2) n
(3) n^{-2} (4) n^{-1}

29. A simple magnifier has converging lens of focal length 2 cm. What is its magnifying power when the image is formed at the near point (D)?
(1) 12.5 (2) 13.5
(3) 14.5 (4) 25

30. The wavefront associated with a line source of wave is
(1) Spherical (2) Cylindrical
(3) Paraboloid (4) Ellipsoid

31. The coefficient of volume expansion of an ideal gas at constant pressure and at temperature T K is equal to
(1) T
(2) $\sqrt{T}$
(3) $\frac{1}{T^2}$
(4) $\frac{1}{T}$

32. Which among the following is not a greenhouse gas?
(1) CO_2
(2) CH_4
(3) N_2O
(4) O_2

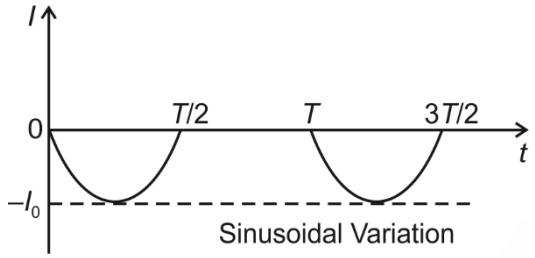
33. An electric heater supplies heat to a gaseous system at a rate of 100 W. If system performs work at a rate of 80 joules per second, then what is the rate at which internal energy increases?
(1) 10 J/s
(2) 20 J/s
(3) 25 J/s
(4) 40 J/s

34. A body undergoes SHM according to the equation $x = (5\text{ m})\cos\left[2\pi t(\text{s}) + \frac{\pi}{4}\right]$. The frequency of kinetic energy of body will be
(1) 2 Hz
(2) 1 Hz
(3) 2π Hz
(4) 4π Hz

35. For a travelling harmonic wave $y(x, t) = 2.0\cos2\pi(10t - 0.008x + 0.35)$, where x and y are in cm and t in s. The phase difference between oscillatory motion of two points, separated by distance of $\frac{\lambda}{2}$, along x-axis is (λ is wavelength of the given wave)
(1) π
(2) $\frac{\pi}{2}$
(3) 2π
(4) 0.8π

SECTION-B

36. The r.m.s value of current over a complete cycle for a current variation shown by the graph is



(1) I_0 (2) $\frac{I_0}{\sqrt{2}}$

(3) $\frac{I_0}{2}$ (4) Zero

37. The maximum velocity of photoelectron when a light of wavelength λ is incident on metal surface of work function W_0 is ($hc > \lambda W_0$)

(1) $\left[\frac{2(hc-\lambda W_0)}{m_e\lambda}\right]^{\frac{1}{2}}$ (2) $\left[\frac{2hc}{m_e\lambda - W_0}\right]^{1/2}$

(3) $\left[\frac{2m_e\lambda}{(hc-\lambda W_0)}\right]^{1/2}$ (4) $\left[\frac{m_e\lambda}{(\lambda W_0+hc)}\right]^{1/2}$

38. An object thrown vertically upwards from the top of a building reaches the ground in time t_1. It takes time t_2 if thrown vertically downward with same speed. If the time of free fall is t, when released from the rest, then

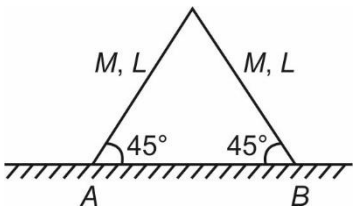
(1) $t=\sqrt{t_1t_2}$

(2) $t=\sqrt{t_1^2+t_2^2}$

(3) $t=\frac{t_1+t_2}{2}$

(4) $t=\frac{t_1t_2}{t_1+t_2}$

39. Two identical ladders are arranged as shown in the figure. Mass of each ladder is M and length is L. The system is in equilibrium. The magnitude of frictional force on each ladder is



(1) Mg

(2) $\frac{Mg}{2}$

(3) $\frac{Mg}{3}$

(4) $\frac{Mg}{4}$

40. A force $\vec{F}=(\hat{i}+2\hat{j}+3\hat{k})$ N displaces a particle from position $\vec{r_1}=(\hat{i}+\hat{j}+\hat{k})$ m to position $\vec{r_2}=(\hat{j}+\hat{k})$ m. The work done by the force in doing so is

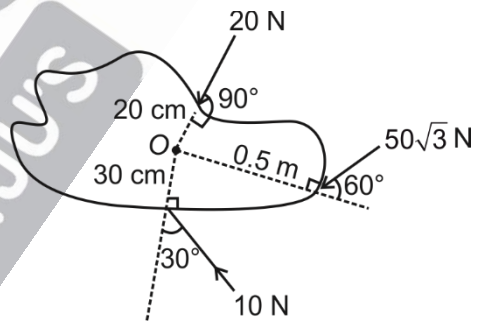
(1) –1 J

(2) –2 J

(3) 1 J

(4) 3 J

41. Point O is the centre of the rigid body shown in the figure. The net torque acting on body due to the coplanar forces as shown in the figure, about point O is



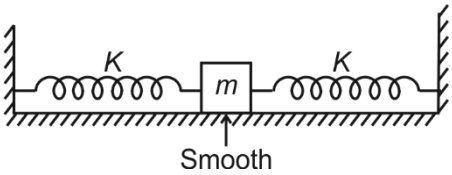
(1) 14 N m, anticlockwise

(2) 36 N m, clockwise

(3) 39 N m, clockwise

(4) 36 N m, anticlockwise

42. A mass m, connected with two identical springs, has oscillation frequency f. If one of the spring is removed, then the new oscillation frequency of the mass will be



(1) f (2) $\sqrt{2}f$

(3) $\frac{f}{2}$ (4) $\frac{f}{\sqrt{2}}$

43. Two identical bodies of mass m, initially at rest, are large distance apart. They approach each other due to gravitational interaction. The relative speed of approach at the instant when they are at distance 'a' apart is

(1) $2\sqrt{\frac{Gm}{a}}$

(2) $\sqrt{\frac{2Gm}{a}}$

(3) $\sqrt{\frac{Gm}{2a}}$

(4) $\sqrt{\frac{5Ga}{m}}$

44. A liquid drop of radius R breaks into 27 tiny drops each of radius r. If the surface tension of liquid is T, then gain in surface energy is

(1) $8\pi R^2T$

(2) $12\pi R^2T$

(3) $28\pi R^2T$

(4) $16\pi R^2T$

45. A Carnot engine working between 300 K and 600 K has a work output 600 J per cycle. The amount of heat energy supplied to the engine from the source in each cycle is

(1) 1200 J

(2) 600 J

(3) 3600 J

(4) 2400 J

46. A train moves towards a stationary observer with speed 32 m/s. The train sounds whistle and its frequency perceived by observer is f_1. If train speed is reduced to 16 m/s. the frequency perceived is f_2. The ratio of $\frac{f_1}{f_2}$ is (take speed of sound 320 m/s)

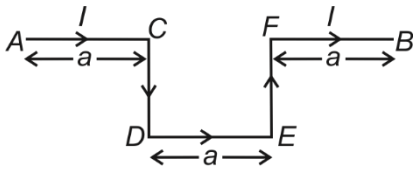
(1) $\frac{18}{19}$

(2) $\frac{19}{18}$

(3) $\frac{17}{18}$

(4) $\frac{18}{17}$

47. A uniform magnetic field $\vec{B} = B_0\hat{k}$ exists in a region. A current carrying wire is placed in x-y plane as shown in the figure. The force acting on the wire AB, if each section of wire is of length 'a', will be



(1) $5IaB_0\hat{j}$

(2) $-5IaB_0\hat{j}$

(3) $-3IaB_0\hat{k}$

(4) $-3IaB_0\hat{j}$

48. If the emitter current in a common emitter mode of a transistor is 10.2 mA, then the collector current will be (given $\beta = 50$)

(1) 10 mA

(2) 0.2 mA

(3) 10.4 mA

(4) 9.8 mA

49. The condition of minimum deviation is achieved in an equilateral prism kept on the prism table of a spectrometer. If the angle of incidence is 53°, the angle of deviation is

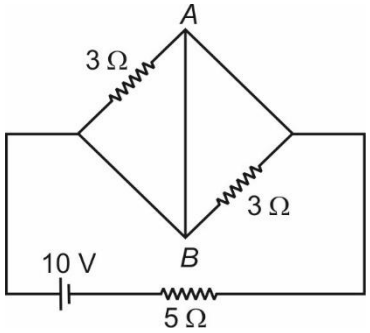
(1) 40°

(2) 46°

(3) 53°

(4) 43°

50. The value of current flowing through wire AB as shown in the figure is



(1) Zero

(2) 2 A

(3) 0.5 A

(4) 1 A

[CHEMISTRY]

SECTION-A

51. Highest bond order among the following species is of

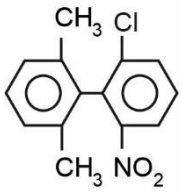
(1) O_2 (2) O_2^+

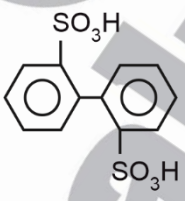
(3) O_2^- (4) O_2^{2+}

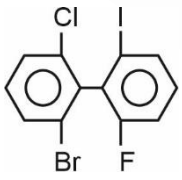
52. Incorrect set of quantum numbers for an electron in an atom is

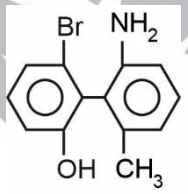
	n	l	m_l	m_s
(1)	3	2	0	$\frac{-1}{2}$
(2)	2	1	–1	$\frac{+1}{2}$
(3)	1	0	0	$\frac{-1}{2}$
(4)	2	1	–2	$\frac{+1}{2}$

53. Optically inactive molecule among the following is

(1) 

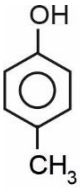
(2) 

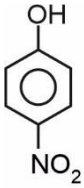
(3) 

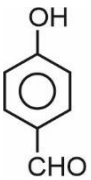
(4) 

54. Most acidic compound among the following is

(1) 

(2) 

(3) 

(4) 

55. **Statement-I:** Terylene is a condensation polymer.

Statement-II: Bakelite is a thermosetting plastic.

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

(1) Statement-I is true but statement-II is false

(2) Statement-I is false but statement-II is true

(3) Both statement-I and statement-II are false

(4) Both statement-I and statement-II are true

56. Oxidation state of three carbon atoms in C_3O_2 are

(1) +1, +1, +2 (2) 0, +2, +2

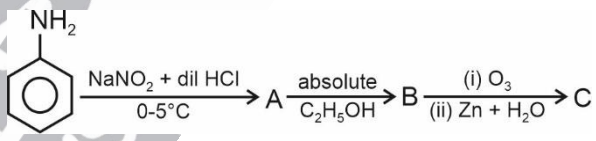
(3) 0, 0, +4 (4) –2, +3, +3

57. Gold sol is most easily coagulated by

(1) Mg^{2+} (2) Al^{3+}

(3) Cl^- (4) SO_4^{2-}

58. Consider the following reaction sequence



The compound C is

(1) Glyoxal (2) Acetophenone

(3) Phenetole (4) Acetone

59. Maximum prescribed concentration of nitrates in drinking water is

(1) 50 ppb (2) 50 ppm

(3) 10 ppm (4) 100 ppb

60. On electrolysis of dilute Na_2SO_4 using Pt electrodes, the product obtained at anode will be

(1) $SO_2(g)$ (2) $O_2(g)$

(3) Na(s) (4) $H_2(g)$

61. Most water soluble sulphate of 2nd group among the following is

(1) $BaSO_4$ (2) $CaSO_4$

(3) $BeSO_4$ (4) $MgSO_4$

62. Which among the following equimolar aqueous salt solutions is most acidic in nature?

(1) Sodium sulphate

(2) Potassium acetate

(3) Ammonium chloride

(4) Ammonium acetate

63. Which one of the following conditions will favour maximum formation of the product in the reaction?

$A(g) + B(g) \rightleftharpoons C(g) + 2D(g)$, $\Delta_r H = + x$ kJ

(1) High pressure and low temperature
(2) High pressure and high temperature
(3) Low pressure and high temperature
(4) Low pressure and low temperature

64. Identify the correct match.

	Name		IUPAC Official name
(a)	Unnilunium	(i)	Bohrium
(b)	Unnilpentium	(ii)	Nobelium
(c)	Unnilennium	(iii)	Lawrencium
(d)	Unnilhexium	(iv)	Seaborgium

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

65. Which of the following molecules will have zero dipole moment?

(1) ClF_3 (2) XeF_4
(3) SF_4 (4) NF_3

66. An element has a face centred cubic (fcc) structure with a unit cell edge length of 200 pm. The atomic radius is

(1) $\frac{100}{\sqrt{2}}$ pm (2) $\frac{200}{\sqrt{2}}$ pm
(3) $\frac{100}{\sqrt{3}}$ pm (4) $\sqrt{3} \times 100$ pm

67. The mixture which shows negative deviation from Raoult's law is

(1) Phenol + aniline
(2) Ethanol + water
(3) Benzene + acetone
(4) Acetone + carbon disulphide

68. Which among the following aqueous solution will have highest freezing point?

(1) 0.1 m NaCl
(2) 0.1 m Urea
(3) 0.1 m K_2SO_4
(4) 0.1 m $MgCl_2$

69. Match the metal ions given in Column I with the spin only magnetic moments of the ions given in Column II and assign the correct code.

	Column I		Column II
a.	Mn^{2+}	(i)	$\sqrt{3}$ BM
b.	Fe^{2+}	(ii)	$\sqrt{35}$ BM
c.	Ti^{2+}	(iii)	$\sqrt{24}$ BM
d.	Cu^{2+}	(iv)	$\sqrt{15}$ BM
		(v)	$\sqrt{8}$ BM

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

70. The geometry and magnetic behaviour of the complex ion, $[Ni(CN)_4]^{2-}$ are

(1) Tetrahedral geometry and paramagnetic
(2) Square planar geometry and diamagnetic
(3) Square planar geometry and paramagnetic
(4) Tetrahedral geometry and diamagnetic

71. The correct increasing order of field strength of ligands is

(1) $I^- < F^- < SCN^- < S^{2-}$
(2) $S^{2-} < F^- < I^- < SCN^-$
(3) $I^- < SCN^- < S^{2-} < F^-$
(4) $SCN^- < S^{2-} < I^- < F^-$

72. The major products A and B formed in the following reaction are

$CH_3 - O - CH_2 - CH_2 - CH_3 \xrightarrow[\Delta]{\text{excess HI}} A + B$

(1) $CH_3 - I + (CH_3)_2CH - I$
(2) $CH_3 - OH + CH_3 - CH_2 - CH_2 - I$
(3) $CH_3 - I + CH_3 - CH_2 - CH_2 - I$
(4) $CH_3 - I + CH_3 - CH_2 - CH_2 - OH$

73. The hydrocarbon that gives more than one mono-chloro product on chlorination in presence of diffused sunlight, is

(1) Ethane
(2) Neopentane
(3) Cyclohexane
(4) Isobutane

74. Given below are two statements:

Statement-I: Dipole-induced dipole interactions are present in HCl and Ne pair.

Statement-II: London forces are associated with polar molecules.

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

(1) Statement-I is correct but statement-II is incorrect

(2) Statement-I is incorrect but statement-II is correct

(3) Both statement-I and statement-II are incorrect

(4) Both statement-I and statement-II are correct

75. Match list-I with list-II

	List-I (Thermodynamic parameters)		**List-II (Reaction spontaneity)**
a.	$\Delta_rH° < 0$ and $\Delta_rS° < 0$	(i)	Non-spontaneous at low temperature
b.	$\Delta_rH° < 0$ and $\Delta_rS° > 0$	(ii)	Non-spontaneous at all temperature
c.	$\Delta_rH° > 0$ and $\Delta_rS° > 0$	(iii)	Spontaneous only at low temperature
d.	$\Delta_rH° > 0$ and $\Delta_rS° < 0$	(iv)	Spontaneous at all temperature

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

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

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

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

76. The number of moles of ammonia molecules produced by 10 moles of nitrogen in excess of hydrogen through Haber's process is

(1) 30 (2) 20

(3) 10 (4) 15

77. When vapours of a primary alcohol is passed over heated copper at 573 K, the product formed is

(1) An aldehyde (2) An alkene

(3) An ether (4) A ketone

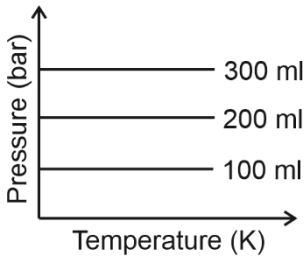
78. Which of the following compounds will not give positive iodoform test?

(1) Ethanol (2) Propanone

(3) Benzophenone (4) Butan-2-ol

79. Choose the correct option for graphical representation of Gay-Lussac's law, which shows a graph of pressure Vs temperature of a gas at different volumes.

(1)



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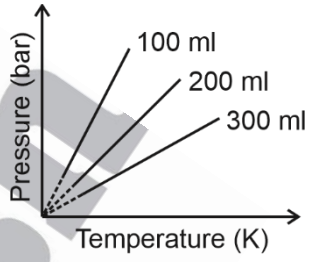

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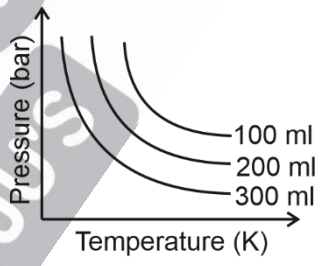

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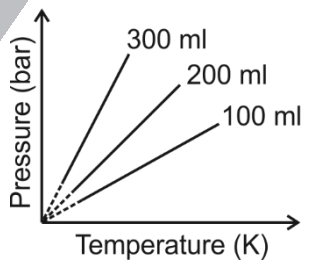


80. Which one among the following is the correct expression for isothermal reversible change?

(1) $w = -2.303\ nR \log \frac{V_f}{V_i}$

(2) $w = -2.303\ nRT \log \frac{V_f}{V_i}$

(3) $w = -2.303\ nRT \log \frac{V_i}{V_f}$

(4) $w = -nRT \log \frac{V_f}{V_i}$

81. Beryllium halides are essentially
(1) Covalent and insoluble in organic solvents
(2) Ionic and soluble in organic solvents
(3) Ionic and insoluble in organic solvents
(4) Covalent and soluble in organic solvents

82. In water, permanent hardness is due to the presence of soluble salts of magnesium and calcium in the form of
(1) HCO_3^- and Cl^-
(2) CO_3^{2-} and SO_4^{2-}
(3) Cl^- and SO_4^{2-}
(4) HCO_3^- and CO_3^{2-}

83. If the rate constant of a first order reaction is $1.386 \times 10^{-2}\ s^{-1}$ than the half-life period of the reaction will be
(1) 50 s
(2) 75 s
(3) 25 s
(4) 100 s

84. Match list-I with list-II.

	List-I		List-II
a.	Tranquilizers	(i)	Prontosil
b.	Analgesics	(ii)	Norethindrone
c.	Antibiotics	(iii)	Meprobamate
d.	Antifertility drug	(iv)	Codeine

Choose the correct answer from the options given below
(1) a(iii), b(iv), c(i), d(ii)
(2) a(i), b(iii), c(ii), d(iv)
(3) a(iii), b(i), c(ii), d(iv)
(4) a(ii), b(iv), c(iii), d(i)

85. What is the IUPAC name of the organic compound formed in the following chemical reaction?

Propionaldehyde $\xrightarrow[(ii)\ H_2O,\ H^+]{(i)\ C_2H_5MgBr,\ dry\ ether}$ product

(1) 3-Methylbutan-2-ol
(2) Pentan-3-ol
(3) 2-Methylbutan-2-ol
(4) Pentan-2-ol

SECTION-B

86. Essential amino acid among the following is
(1) Alanine (2) Threonine
(3) Glutamic acid (4) Serine

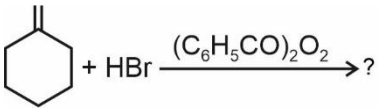
87. In which of the following arrangements the given sequence is not strictly according to the properties indicated against it?
(1) $H_2O < H_2S < H_2Se$: Increasing acidic character
(2) HBr < HI < HF: Increasing boiling point
(3) HOCl < HOBr < HOI: Increasing acidic strength
(4) $As_2O_3 < Sb_2O_3 < Bi_2O_3$: Increasing basic character

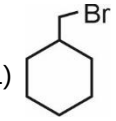
88. **Statement-I:** $AlCl_3$ is dimerised through halogen bridging.
Statement-II: Maximum covalency of boron is six.
In the light of the above statements, choose the correct answer from the options given below
(1) Statement-I is incorrect but statement-II is correct
(2) Both statement-I and statement-II are correct
(3) Both statement-I and statement-II are incorrect
(4) Statement-I is correct but statement-II is incorrect

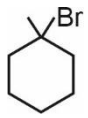
89. If the conductivity of 0.002 M acetic acid is 9×10^{-5} S cm^{-1} then the degree of dissociation of 0.002 M acetic acid will be [given: $\lambda°(H^+) = 349$ S $cm^2\ mol^{-1}$ and $\lambda°(CH_3COO^-) = 41$ S $cm^2\ mol^{-1}$]
(1) 0.12 (2) 0.25
(3) 0.03 (4) 0.31

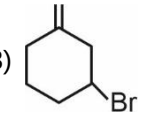
90. Fe_2O_3 is reduced to FeO in blast furnace in the temperature range of
(1) 900-1500 K (2) 800-1200 K
(3) 500-800 K (4) 300-500 K

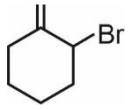
91. The major product of the following chemical reaction is



(1) 

(2) 

(3) 

(4) 

92. Match list-I with list-II.

	List-I (Refining method)		List-II (Metal)
a.	Zone refining	(i)	Zirconium
b.	Mond process	(ii)	Zinc
c.	van Arkel Method	(iii)	Nickel
d.	Distillation	(iv)	Silicon

Choose the correct answer from the options given below

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

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

93. Given below are two statements:

Statement-I: In all the conformations of ethane, the bond angles are different.

Statement-II: In all the conformations of ethane, the bond lengths remain the same.

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

(1) Statement-I is incorrect but statement-II is correct

(2) Both statement-I and statement-II are correct

(3) Both statement-I and statement-II are incorrect

(4) Statement-I is correct but statement-II is incorrect

94. Total number of structural isomers of C_3H_8O are

(1) 2 (2) 3

(3) 4 (4) 5

95. Which among the following reactions is not used for the preparation of benzaldehyde?

(1) Gatterman-Koch reaction

(2) Etard reaction

(3) Hell-Volhard-Zelinsky reaction

(4) Stephen reaction

96. Right option for the ratio of number of octahedral voids and total octahedral and tetrahedral voids in face centred cubic unit cell is

(1) 1 : 2 (2) 2 : 3

(3) 1 : 3 (4) 3 : 2

97. Minimum ionic radii among the following is of

(1) Eu^{3+} (2) Ce^{3+}

(3) Tm^{3+} (4) Dy^{3+}

98. Which one of the following will have largest number of atoms?

(1) 3.4 g NH_3 (2) 3.6 g H_2O

(3) 0.16 g CH_4 (4) 13.2 g CO_2

99. The number of photons of light with a wavelength 6626 pm that provide 1 J of energy is (Planck's constant (h) = 6.626×10^{-34} Js)

(1) 6.66×10^{15} (2) 1.11×10^{16}

(3) 2.22×10^{17} (4) 3.33×10^{16}

100. Lactose on hydrolysis gives

(1) α-D-glucose and β-D-fructose

(2) β-D-galactose and β-D-glucose

(3) α-D-glucose and β-D-galactose

(4) β-D-glucose and β-D-fructose

[BOTANY]

SECTION-A

101. Select the **incorrect** match.

(1) Herbarium – Preserved plant specimens on sheets

(2) Museum – Conserved animal specimens in a particular area

(3) Key – Analytical in nature

(4) Monograph – Information on any one taxon

102. All of the following criteria were used by R.H. Whittaker to propose five kingdom classification, **except**

(1) Mode of nutrition

(2) Cell structure

(3) Ribosome structure

(4) Cell type

103. Which of the following protists are photosynthetic and good indicators of water pollution?

(1) Diatoms (2) Dinoflagellates

(3) Euglenoids (4) Slime moulds

104. Hydrocolloids like agar agar are present in

(1) Green algae (2) Red algae

(3) Brown algae (4) Blue-green algae

105. Select the **incorrect** statement w.r.t pteridophytes.
(1) *Equisetum* produces cones
(2) They include ferns and horsetails
(3) The main plant body is sporophyte
(4) Prothallus is gametophytic non-photosynthetic structure

106. Axillary buds of stems may also get modified into woody, straight and pointed structures called thorns as in
(1) *Opuntia*
(2) *Bougainvillea*
(3) Pumpkin
(4) Cucumber

107. Select the mismatched pair w.r.t. stamen.
(1) Epipetalous – Brinjal
(2) Epitepalous – Mustard
(3) Diadelphous – Pea
(4) Polyadelphous – Citrus

108. Endarch condition of xylem is seen in
(1) Dicot root
(2) Monocot root
(3) Dicot stem
(4) Monocot leaf

109. Read the following statements and select the **correct** option.
A. Vascular cambium is completely secondary in origin in dicot roots.
B. Casparian strips are seen in monocot root and stem.
(1) Only statement A is correct
(2) Only statement B is correct
(3) Both statements A and B are correct
(4) Both statements A and B are incorrect

110. Inclusion bodies
(1) Do not lie freely in the cytoplasm of prokaryotes
(2) Help in photosynthesis as it contains pigments
(3) Store reserve material in prokaryotes
(4) Are membrane bound

111. Select the **odd** one w.r.t cell organelles and their functions.
(1) RER – Helps in secretory protein synthesis
(2) Golgi apparatus – Important site for glycosylation
(3) Lysosome – Enzymes are active at basic pH
(4) Vacuole – Maintains high concentration of ions

112. APC (Anaphase promoting complex) ensures
(1) Attachment of spindle fibres to kinetochores
(2) Separation of sister chromatids
(3) Formation of spindle fibres
(4) Both (1) and (2)

113. The homologous chromosomes separate but sister chromatids remain associated at their centromeres during which of the following stages of the cell cycle?
(1) Metaphase I
(2) Anaphase II
(3) Prophase I
(4) Anaphase I

114. Select the **incorrect** match.
(1) Leptotene – Compaction of chromatin
(2) Zygotene – Synapsis occurs
(3) Pachytene – Short lived as compared to zygotene
(4) Diplotene – Dissolution of the synaptonemal complex

115. Select the **incorrect** statement.
(1) For a solution, ψ_s is always negative
(2) For a solution at atmospheric pressure ψ_w is equal to ψ_s
(3) More the solute molecules, the lower is the solute potential
(4) The greater the concentration of water in a system, less is its water potential

116. Facilitated diffusion does not involve
(1) Cell membrane
(2) Movement of molecules along the concentration gradient
(3) Transporters
(4) Uphill transport of molecules

117. Biological nitrogen fixation forms _____ from N_2.
(1) NO_2^- (2) NO_3^-
(3) NH_3 (4) NH_4^+

118. Which of the following nutrients is a component of several enzymes like nitrogenase and nitrate reductase?
(1) Boron (2) Magnesium
(3) Molybdenum (4) Zinc

119. The primary CO_2 acceptor during the carbon fixation in C_4 plants present in the mesophyll cells of leaf is
(1) 3C compound
(2) Oxaloacetic acid
(3) 5C compound called RuBP
(4) Malic acid

120. Which of the following is **not** related to cyclic photophosphorylation?
(1) PS I
(2) Oxygen evolution
(3) Cyclic flow of electrons
(4) ATP synthesis

121. During which of the following conversions, substrate level phosphorylation takes place in Krebs cycle?
(1) Isocitrate → α Ketoglutaric acid
(2) Succinyl CoA → Succinic acid
(3) Succinic acid → Fumaric acid
(4) Malic acid → Oxaloacetic acid

122. Cytochrome c oxidase complex containing cytochromes a and a_3, and two copper centres is referred to
(1) Complex I (2) Complex II
(3) Complex III (4) Complex IV

123. Which of the following is redifferentiated tissue?
(1) Cork cambium
(2) Wound cambium
(3) Interfascicular cambium
(4) Secondary cortex

124. Select the **incorrect** match.
(1) Auxin → Causes apical dominance
(2) Gibberellin → Promotes bolting
(3) Cytokinin → Promotes senescence
(4) Abscisic acid → Stress hormone

125. Select the **odd** one w.r.t heterogametes.
(1) *Volvox*
(2) *Fucus*
(3) Human
(4) *Spirogyra*

126. Select the **incorrect** statement.
(1) The most vital event of sexual reproduction is perhaps fusion of gametes
(2) Majority of plants show internal fertilization
(3) Meiocyte of fruit fly has 8 chromosomes
(4) Papaya and date palm are monoecious plants

127. Select the **incorrect** match w.r.t. ploidy level of structures found in angiosperms.
(1) Nucellus – 2n
(2) MMC – 2n
(3) Functional megaspore – n
(4) Female gametophyte – 2n

128. Transfer of pollen grains from anther to the stigma of a different plant brings genetically different types of pollen grains to the stigma in
(1) Autogamy
(2) Xenogamy
(3) Cleistogamy
(4) Geitonogamy

129. In few species, the thalamus also contributes to the fruit formation. All the given species show the same, **except**
(1) Cashew
(2) Strawberry
(3) Apple
(4) Banana

130. Both males and females bear same number of chromosomes.
Above statement does not hold true for
(1) Humans
(2) *Drosophila*
(3) Birds
(4) Grasshopper

131. Select the **incorrect** match.

(1) Thalassemia – Autosomal recessive disorder

(2) Phenylketonuria – Autosomal dominant disorder

(3) Sickle cell anaemia – Defect caused by substitution of glutamic acid by valine at 6th position

(4) Colour blindness – Sex linked recessive disorder

132. Select the **odd** statement w.r.t. structure of DNA.

(1) A nitrogenous base is linked to the OH of 1′C pentose sugar through a N-glycosidic linkage to form a nucleoside

(2) Cytosine is common for both RNA and DNA

(3) Two nucleotides are linked through 3′-5′ phosphodiester linkage to form a dinucleotide

(4) Phosphoester bond joins sugar to base

133. Select the **incorrect** statement about replication.

(1) DNA polymerase cannot initiate the process of replication

(2) Okazaki fragments are joined by DNA ligase

(3) On template strand with polarity 3′ to 5′ the replication is discontinuous

(4) Replication does not initiate randomly at any place

134. If there is mutation in regulatory gene of *lac* operon then there will be no synthesis of

(1) Repressor protein

(2) β galactosidase

(3) Permease

(4) Transacetylase

135. The ability to generate a whole plant from any cell/explant is called

(1) Totipotency

(2) Apical meristem culture

(3) Somaclones

(4) Somatic hybrids

SECTION-B

136. Resistance to yellow mosaic virus in mung bean was created through

(1) Conventional breeding

(2) Mutation breeding

(3) Genetic engineering

(4) Tissue culture

137. Fungus *Trichoderma polysporum* produces____, which is an immunosuppressive agent.

Fill in the blank with **correct** option.

(1) Streptokinase (2) Cyclosporin A

(3) Statins (4) Lipids

138. LAB converts milk into curd which improves the nutritional quality of milk as it increases content of

(1) Vitamin B_5 (2) Vitamin B_{12}

(3) Vitamin A (4) Vitamin C

139. Commensalism is a type of interspecific interaction where one species is benefited and the other remains unharmed (neither benefited nor harmed). This is exemplified by

(1) Fungi and roots of higher plants

(2) Barnacles growing on back of whale

(3) Sea anemone and hermit crab

(4) Dogs and ticks

140. Majority of animals and nearly all plants cannot maintain a constant internal environment, their body temperature changes with the ambient temperature. They are called

(1) Conformers (2) Regulators

(3) Partial regulators (4) Suspenders

141. The rate of production of organic matter during photosynthesis is called

(1) Gross primary productivity

(2) Secondary productivity

(3) Net primary productivity

(4) Both (1) and (3)

142. The most important cause driving animals and plants to extinction is

(1) Overexploitation

(2) Habitat loss and fragmentation

(3) Co-extinction

(4) Alien species invasion

143. Select the **incorrect** match.
(1) Primary producer – Grass
(2) Secondary consumer – Man
(3) Primary consumer – Goat
(4) Tertiary consumer – Rabbit

144. Select the **odd** one w.r.t *ex-situ* conservation strategy.
(1) Botanical garden
(2) Wildlife safari parks
(3) Biodiversity hot spots
(4) Zoological park

145. Montreal protocol was signed in 1987 to
(1) Prevent cutting of forests
(2) Lay the road with polyblend only
(3) Control emission of ozone depleting substances
(4) Prevent killing of animals

146. Slash and burn agriculture is commonly called
(1) Chipko movement
(2) Joint forest management
(3) Jhum cultivation
(4) Reforestation

147. The component of xylem which is living, is
(1) Xylem fibre
(2) Xylem parenchyma
(3) Tracheid
(4) Vessel

148. Bivalents align themselves at equatorial or metaphasic plate in
(1) Metaphase I
(2) Anaphase I
(3) Anaphase II
(4) Telophase I

149. All of the following enzymes of Krebs cycle are found in mitochondrial matrix, **except**
(1) Citrate synthase
(2) Malate dehydrogenase
(3) Succinate dehydrogenase
(4) Fumarase

150. All viruses do not contain
(1) Genetic material
(2) Protein capsid
(3) Capsomeres
(4) Envelope

[ZOOLOGY]

SECTION-A

151. Match column-I with column-II and choose the correct option.

	Column-I		Column-II
a.	External fertilisation	(i)	Syngamy occurs inside the body of a female organism
b.	Internal fertilisation	(ii)	Unfertilized egg develops into male organism
c.	Arrhenotoky	(iii)	Syngamy occurs outside the body of a female organism

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

152. How many of the following STIs given in a box below have bacterium as their causative agent?

Genital herpes, Trichomoniasis, Genital warts, Syphilis, Gonorrhoea, AIDS

Choose the correct option.
(1) Two
(2) Three
(3) Four
(4) Five

153. Select the option that is correct for the type of contraceptive devices with their examples.
(1) Progestasert and CuT are hormone-releasing IUDs.
(2) Cu7, Multiload 375 and LNG-20 are copper releasing IUDs.
(3) Non-medicated IUDs include LNG-20, Lippes loop and CuT.
(4) Mala D and Mala N are examples of combined oral contraceptive pills.

154. Which of the following statement about human sperm is correct?
(1) The neck region possesses numerous mitochondria.
(2) For normal fertility, at least 40% of total sperms must have normal shape, size and vigorous motility.
(3) The sperm lysins present in the acrosome of sperm's head dissolve the egg envelope so as to facilitate fertilisation.
(4) Sperm head contains an elongated diploid nucleus.

155. Choose the correct option to complete the analogy w.r.t. presence of glands.
Male reproductive system: Cowper's glands : : Female reproductive system : _____
(1) Bulbourethral glands
(2) Bartholin's glands
(3) Seminal vesicles
(4) Prostate gland

156. *Psilophyton* did not give rise to which of the following plants?
(1) Sphenopsids (2) Conifers
(3) Bryophytes (4) Ferns

157. Select the incorrect statement w.r.t evolution of man.
(1) *Dryopithecus* and *Ramapithecus* were hairy and walked like gorillas and chimpanzees.
(2) *Ramapithecus* was more man-like while *Dryopithecus* was more ape-like.
(3) The brain capacity of *Homo habilis* was 1450 cc.
(4) Pre-historic cave art developed about 18,000 years ago.

158. In humans, *Plasmodium* reaches the liver through blood as ___A___. The parasite in the hepatocyte reproduces ___B___, bursting the cell and releasing into the blood.
Fill the blanks A and B correctly with a suitable option.

	A	B
(1)	Merozoites	Sexually
(2)	Trophozoites	Asexually
(3)	Sporozoites	Sexually
(4)	Sporozoites	Asexually

159. Select the incorrect match w.r.t. pathogens listed in column A and corresponding diseases in column B.

	Column A		Column B
(1)	*Haemophilus influenzae*	–	Pneumonia
(2)	*Salmonella typhi*	–	Typhoid
(3)	*Wuchereria malayi*	–	Ascariasis
(4)	*Epidermophyton*	–	Ringworm

160. Read the following given statements w.r.t lymphoid organs.
Statement A: Bone marrow and thymus are primary lymphoid organs.
Statement B: The thymus is quite small at the time of birth but keeps increasing in size with age.
Choose the correct option.
(1) Only statement A is correct.
(2) Only statement B is correct.
(3) Both statements A and B are correct.
(4) Both statements A and B are incorrect

161. Which of the following statements is correct w.r.t. cancer?
(1) Transformation of cancerous cells into non-neoplastic cells may be induced by oncogenes.
(2) Malignant tumors are mass of non-proliferating cells called neoplastic or tumor cells.
(3) Benign tumors normally remain confined to their original location and do not spread to other parts of the body.
(4) Malignant tumors do not possess the property of metastasis.

162. Choose the mismatch w.r.t. drugs.

(1)	Opioid	–	Binds to specific opioid receptors present principally in cardiovascular system of the body
(2)	Cannabinoid	–	Binds to cannabinoid receptor present principally in human brain
(3)	Coca alkaloid	–	Interferes with the transport of the neuro-transmitter dopamine
(4)	Barbiturates	–	Help patients to cope with mental illness like depression, insomnia, etc.

163. Comprehend the following given statements w.r.t MOET.

A: MOET is a programme for herd improvement.

B: Cow is administered hormones with LH-like activity.

Choose the correct option.

(1) Both statements A and B are correct

(2) Both statements A and B are incorrect

(3) Only statement B is correct

(4) Only statement A is correct

164. Fisheries include rearing, catching and selling of fishes, crustaceans and molluscs. Which of the following is not a marine fish?

(1) *Hilsa* (2) Shellfish

(3) Pomfret (4) Mackerel

165. Choose the incorrect match.

(1) Interspecific hybridization – Results in hybrids e.g. mule whose parents are mare and male donkey

(2) Out-breeding – Hisardale is a result of one of its techniques

(3) Cross-breeding – Best technique to overcome inbreeding depression in less time

(4) Inbreeding – Pure lines with increased homozygosity are generated

166. If a foreign gene is inserted at *Cla*I site in pBR322, then

(1) Non-recombinants so produced will be tet^s.

(2) Non-recombinants so produced will be amp^s.

(3) Recombinants so produced will be amp^R but tet^s.

(4) Recombinants so produced will be amp^R as well as tet^R.

167. Select the incorrect match.

(1) Lysozyme – Degrades bacterial cell wall

(2) Cellulase – Degrades plant cell wall

(3) Micro-injection – rDNA is directly injected into the nucleus of an animal cell

(4) Chitinase – Degrades algal cell wall

168. Read the following statements w.r.t bioreactor.

Statement A: The stirrer of a stirred-tank bioreactor facilitates the even mixing and oxygen availability throughout the bioreactor.

Statement B: A bioreactor does not exhibit the optimal conditions for achieving desired product.

Choose the correct option.

(1) Only statement A is correct.

(2) Only statement B is correct.

(3) Both statements A and B are correct.

(4) Both statements A and B are incorrect.

169. Match column-I with column-II and choose the correct option.

	Column-I		Column-II
a.	Probe	(i)	Antigen-antibody interaction
b.	ELISA	(ii)	ssDNA/RNA tagged with radioactive molecule
c.	α-1-antitrypsin	(iii)	Produced human protein-enriched milk
d.	First transgenic cow, Rosie	(iv)	Used to treat emphysema

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

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

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

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

170. Select the correct statement among the following given options.

(1) A nematode, *Meloidogyne incognita* infects the stems of tobacco plants and causes an increase in yield.

(2) RNAi involves silencing of a specific mRNA due to a complementary dsDNA molecule that binds to and prevents translation of the mRNA.

(3) Bt toxin protein exists as an inactive protoxin but once an insect ingests the inactive toxin, it is converted into an active form due to the alkaline pH of midgut which solubilises the crystals.

(4) Proteins encoded by the genes *cryIAc* and *cryIIAb* control the corn borer.

171. Select the incorrect match from the options given below:

Organisms	Characteristic features
(1) *Fasciola*	– Suckers are present.
(2) *Ctenoplana*	– Body bears eight external rows of ciliated comb plates, which help in locomotion.
(3) *Obelia*	– Polyps produce medusae sexually and medusae form the polyps asexually.
(4) *Spongilla*	– Fertilisation is internal and development is indirect having a larval stage which is morphologically distinct from the adult.

172. Hemichordates have a rudimentary structure in the collar region called

(1) Vertebral column (2) Trunk

(3) Proboscis gland (4) Stomochord

173. How many of the following given characteristics is/are shown by the class to which *Clarias* belongs?

(a) Sexes are separate

(b) Fertilisation is usually external

(c) Mostly oviparous

(d) Development is direct

Choose the correct option.

(1) Four (2) Three

(3) Two (4) One

174. Match the type of epithelium listed in column-I with their description in column-II and choose the correct option.

Column-I	Column-II
a. Cuboidal epithelium	(i) Main function is to provide protection against chemical and mechanical stresses
b. Compound epithelium	(ii) Commonly found in tubular parts of nephrons in kidneys
c. Columnar epithelium	(iii) Composed of a single layer of tall and slender cells

(1) a(ii), b(i), c(iii) (2) a(i), b(ii), c(iii)

(3) a(i), b(iii), c(ii) (4) a(ii), b(iii), c(i)

175. Identify the incorrect statement w.r.t. cockroach.

(1) Malpighian tubules are yellow coloured thin filamentous structures which aid in removal of excretory products from haemolymph.

(2) The hindgut is broader than midgut and is differentiated into ileum, colon and rectum.

(3) Heart consists of elongated muscular tube lying along mid-dorsal line of thorax and abdomen.

(4) Each Malpighian tubule absorbs nitrogenous waste products and convert them into urea.

176. Read the statements given below w.r.t *Periplaneta americana* carefully.

(A) 7^{th} sternum in female cockroach is star shaped.

(B) 6^{th}-7^{th} abdominal segments in male cockroach contain mushroom gland.

(C) 7^{th} tergum along with 8^{th} sternum in female cockroach forms brood pouch.

(D) 10^{th} segment in male cockroach bears a pair of jointed filamentous structures called anal cerci.

Select the option that constitutes correct statements only.

(1) A and B (2) B and C

(3) A and C (4) B and D

177. Which of the following is an example of non-competitive inhibition?

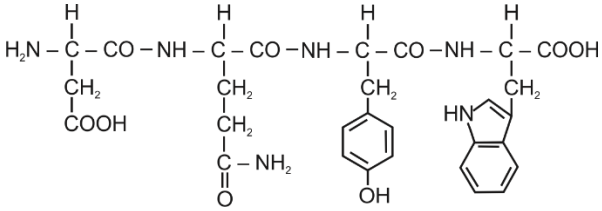
(1) Inhibition of alcohol dehydrogenase by ethanol

(2) Inhibition of succinic dehydrogenase by malonate

(3) Inhibition of cytochrome oxidase by cyanide

(4) Inhibition of succinic dehydrogenase by oxaloacetate

178. Identify a suitable option which correctly name the components of following given structure of a tetrapeptide.



(1) Glutamic acid – Asparagine – Tyrosine – Serine

(2) Aspartic acid – Glutamine – Tyrosine – Tryptophan

(3) Glutamic acid – Aspartic acid – Tyrosine – Alanine

(4) Aspartic acid – Valine – Phenylalanine – Arginine

179. Choose the incorrect match from the options given below:

(1) Lipoprotein – Chylomicron

(2) Chromoprotein – Haemoglobin

(3) Phosphoprotein – Casein of milk

(4) Nucleoprotein – Cytochrome

180. Which of the following is a disaccharide and does not give positive test with Benedict's reagent?

(1) Cellulose (2) Sucrose

(3) Lactose (4) Maltose

181. The opening of oesophagus into stomach and the opening of hepato-pancreatic duct into duodenum respectively are regulated by

(1) Sphincter of Boyden and sphincter of Oddi

(2) Gastro-oesophageal sphincter and sphincter of Boyden

(3) Sphincter of Oddi and sphincter of Boyden

(4) Gastro-oesophageal sphincter and sphincter of Oddi

182. Which of the following reactions is correct w.r.t. the process of digestion and their site of occurrence?

(1) In stomach:

$$DNA \xrightarrow{DNase} 2\text{-deoxyribonucleotides}$$

(2) In small intestine:

$$Diglycerides \xrightarrow[pH\,1.8]{Lipase} Monoglyceride + Glycerol$$

(3) In mouth:

$$Starch_{(70\%)} \xrightarrow[pH\ 5.8]{Ptyalin} Isomaltose$$

(4) In small intestine:

$$Dipeptides \xrightarrow{Dipeptidases} Amino\ acids$$

183. Select the correct answer w.r.t lung capacities.

(1) EC = TV + IRV (2) FRC = ERV + IRV

(3) VC = EC + IRV (4) TLC = IC + ERV

184. Which of the following given options holds true for Haldane's effect?

(1) High pCO_2, low pO_2, high temperature, high pH

(2) High pO_2, low pCO_2, high pH, low temperature

(3) High pO_2, low pCO_2, low pH, high temperature

(4) High pH, low temperature, low pO_2, high pCO_2

185. A person went to a cardiologist complaining about being tachycardic. Upon examination, his heart rate was 100 beats per minute; his end-diastolic volume was 100 mL, whereas end-systolic volume was 40 mL. What was his calculated cardiac output per minute?

(1) 9 L

(2) 11 L

(3) 6 L

(4) 12 L

SECTION-B

186. Which of the following is the correct route through which impulse travels in human heart?

(1) AV node → SA node → Heart muscles → Purkinje fibres → Bundle of His

(2) SA node → AV node → Bundle of His → Heart muscles → Purkinje fibres

(3) SA node → AV node → Bundle of His → Purkinje fibres → Heart muscles

(4) Bundle of His → SA node → AV node → Purkinje fibres → Heart muscles

187. Select the incorrect match.

(1) Glycosuria	Presence of glucose in urine
(2) Glomerulonephritis	Inflammation of DCT of the kidneys
(3) Haematuria	Presence of blood in urine
(4) Ketonuria	Presence of ketone bodies in urine

188. **Assertion (A):** ANF mechanism acts as a check on the renin-angiotensin mechanism.

Reason (R): The wall of the atria of the heart releases ANF in response to an increase in blood pressure. ANF can cause vasodilation and thereby decrease the blood pressure.

(1) (A) is true but (R) is false.

(2) (A) is false but (R) is true.

(3) Both (A) and (R) are true but (R) is not the correct explanation of (A).

(4) Both (A) and (R) are true and (R) is the correct explanation of (A).

189. Which of the following sets of bones is included under the category of cranial bones?
(1) Parietal bone, frontal bone, zygomatic, vomer, sphenoid bone, temporal bone
(2) Parietal bone, occipital bone, frontal bone, vomer, maxilla, mandible
(3) Parietal bone, ethmoid bone, sphenoid bone, frontal bone, temporal bone, occipital bone
(4) Parietal bone, sphenoid bone, hyoid bone, frontal bone, lacrimal bone, vomer

190. Select the option that holds true w.r.t. contraction of skeletal muscles.
(1) The length of A-band remains same; the length of sarcomere and I-band decreases.
(2) The length of A-band remains same; the length of sarcomere and I-band increases.
(3) The length of A-band decreases; the length of sarcomere and I-band increases.
(4) The length of A-band increases; the length of sarcomere and I-band decreases.

191. Read the following given statements.
A: Meissner's corpuscles are present immediately below the epidermis.
B: Pacinian corpuscles respond to gentle touch.
C: Cristae and maculae are examples of statoreceptors.
D: Lateral line sense organs are stimulated by pressure and water currents.
Select the option including correct statements only.
(1) A and B (2) B and C
(3) A, C and D (4) B, C and D

192. Which of the following is correct w.r.t. the differences between rods and cones?

		Rods	**Cones**
(1)	Visual pigment	Iodopsin	Rhodopsin
(2)	Function	Scotopic vision	Photopic vision
(3)	Sensation of colour	Present	Absent
(4)	Location	Present in fovea centralis	Absent in fovea centralis

193. Comprehend the statements and select the incorrect one.
(1) PNS is divided into somatic neural system and autonomic neural system.
(2) CNS includes brain and spinal cord.
(3) Autonomic neural system is classified into sympathetic neural system and parasympathetic neural system.
(4) Visceral neural system relays impulses from CNS to skeletal muscles.

194. How many of the following hormones given in the box below are synthesized by hypophysis?

PRL, TSH, ACTH, FSH, LH, Oxytocin, ADH

Choose the correct option.
(1) Seven
(2) Six
(3) Five
(4) Four

195. Select the incorrect option w.r.t. hormone, its chemical nature and gland from which it is released.

	Hormone	**Nature of hormone**	**Source gland**
(1)	Secretin	Peptide	Duodenum and jejunum
(2)	Somatostatin	Polypeptide	δ-cells of pancreas
(3)	Epinephrine	Amino-acid derivative	Adrenal cortex
(4)	Thyrocalcitonin	Protein	Thyroid

196. Presence of water vascular system is a distinctive feature of
(1) *Echinus* and *Asterias*
(2) *Anopheles* and *Culex*
(3) *Limulus* and *Locusta*
(4) *Aedes* and *Apis*

197. Which of the following is not a characteristic feature of *Pteropus*?
(1) Organ-system level of organization
(2) Absence of segmentation
(3) Bilateral symmetry
(4) Complete digestive system

198. Match column-I with column-II and choose the correct option.

	Column-I		Column-II
(a)	Alkaloids	(i)	Gums, Rubber
(b)	Terpenoids	(ii)	Monoterpenes, Diterpenes
(c)	Polymeric substances	(iii)	Morphine, Codeine

	(a)	(b)	(c)
(1)	(iii)	(ii)	(i)
(2)	(i)	(ii)	(iii)
(3)	(i)	(iii)	(ii)
(4)	(iii)	(i)	(ii)

199. Analyse the equations given below and select the reaction that belongs to the fourth class of enzyme as per the classification of IUB.

(1) Glucose + ATP $\xrightarrow{\text{glucohexokinase}}$ Glucose 6 phosphate + ADP

(2) Sucrose + H_2O $\xrightarrow{\text{sucrase}}$ Glucose + fructose

(3) Phosphoenol pyruvic acid + CO_2 $\xrightarrow[\text{PEP carboxylase}]{\text{ATP}}$ Oxaloacetic acid

(4) Fructose 1, 6-bisphosphate $\xrightarrow{\text{aldolase}}$ Dihydroxyacetone phosphate + Glyceraldehyde 3-phosphate

200. Read the following statements w.r.t. respiratory disorders.

A: Asthma is a difficulty in breathing causing wheezing.

B: Asthma occurs due to inflammation of alveoli.

C: Emphysema is a chronic disorder in which mainly inflammation of bronchi and bronchioles occur.

D: Long exposure to the dust produced by stone breaking industries can give rise to inflammation leading to fibrosis.

Choose the correct option.

(1) A and C

(2) B and C

(3) A and D

(4) B and D

❑ ❑ ❑