

Test Series [Option-1] for NEET-2023

MM : 720

Time : 3 hrs. 20 min.

Mock Test

PHYSICS : SECTION-A

All questions are compulsory in section A

1. A bullet of mass 12 gm is fired from a gun of mass 480 g. If the recoil velocity is 1 m/s, the velocity of the bullet is

- (1) 40 m/s (2) 40 cm/s
(3) 50 m/s (4) 1 m/s

2. 

In the above configuration, the electric field is zero at a point on the line joining two dipoles at a distance 'x' from dipole of moment 8P. Then x is equal to

- (1) 15 cm (2) 10 cm
(3) 22.5 cm (4) 20 cm

3. If $\vec{A} \times \vec{B} = \vec{C}$, then \vec{C} is perpendicular to

- (1) \vec{A} (2) \vec{B}
(3) $\vec{A} + \vec{B}$ (4) all of these

4. A wave travelling in negative x-direction with $A = 0.4$ m has a velocity of 300 m/s. If $\lambda = 20$ m, then correct expression for the wave is

- (1) $y = 0.4 \sin \left[2\pi \left(15t + \frac{x}{20} \right) \right]$
(2) $y = 0.4 \sin \left[2\pi \left(15t - \frac{x}{20} \right) \right]$
(3) $y = 0.4 \sin \left[2\pi \left(30t + \frac{x}{10} \right) \right]$
(4) $y = 0.4 \sin \left[\pi \left(30t - \frac{x}{10} \right) \right]$

5. As per Albert Einstein, if energy of incident photon exceeds the work function of metal, then

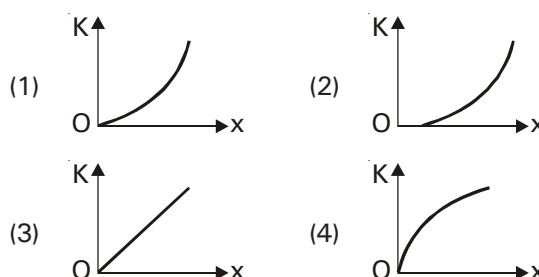
- (a) some electrons are emitted with maximum K.E.
(b) more tightly bound electrons emerge with K.E. less than the maximum value
(c) maximum K.E. of emitted photoelectrons is determined by the energy of each photon

- (1) both a & b (2) both b & c
(3) a, b & c (4) both a & c

6. Three bodies, a solid cylinder, a solid sphere and a spherical shell roll down the same inclined plane without slipping. They start from rest. The radii and masses of the bodies are identical. Which body has the greatest rotational kinetic energy while reaching the bottom of the inclined plane?

- (1) Solid sphere (2) Solid cylinder
(3) Spherical shell (4) All have same value

7. A body starts moving under the action of a constant force. The variation of its kinetic energy K with the distance travelled x is given by



8. A stretched string of 1m length and mass 5×10^{-4} kg is having tension of 20N. If it is plucked at 25cm from one end then it will vibrate with frequency

- (1) 100 Hz (2) 200 Hz
(3) 256 Hz (4) 400 Hz

9. Let a car of mass 'm' be moving with speed 'v' on an under-bridge (concave upward road) of radius 'r'. Then the thrust on the road at the lowest position will be

(1) $mg + \frac{mv^2}{r}$ (2) $mg - \frac{mv^2}{r}$
 (3) mg (4) none of these

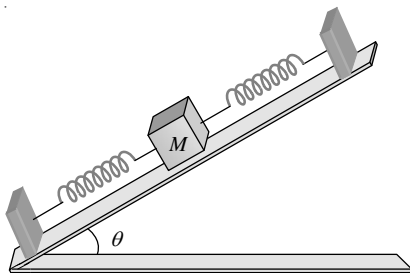
10. A body falls from a height $h = 200$ m. The ratio of distance travelled in consecutive 2 seconds during $t = 0$ to $t = 6$ second of the journey is

(1) 1 : 4 : 9 (2) 1 : 2 : 4
 (3) 1 : 3 : 5 (4) 1 : 2 : 3

11. For an isothermal expansion of a perfect gas, the value of $\frac{\Delta P}{P}$ is equal

(1) $-\gamma^{1/2} \frac{\Delta V}{V}$ (2) $-\frac{\Delta V}{V}$
 (3) $-\gamma \frac{\Delta V}{V}$ (4) $-\gamma^2 \frac{\Delta V}{V}$

12.



On a smooth inclined plane, a body of mass $M = 2$ kg is attached between two springs. The other ends of the springs are fixed to firm supports. Each spring has force constant 400 N/m and $\theta = 37^\circ$. The period of oscillation of the body is

(1) 0.157 s (2) 0.314 s
 (3) 0.243 s (4) 0.28 s

13. In reactors, light nuclei (moderators) are provided along with the fissionable nuclei for slowing down fast neutrons. Which of the following is not the moderator commonly used?

(1) Water (2) Heavy water
 (3) Graphite (4) Sodium

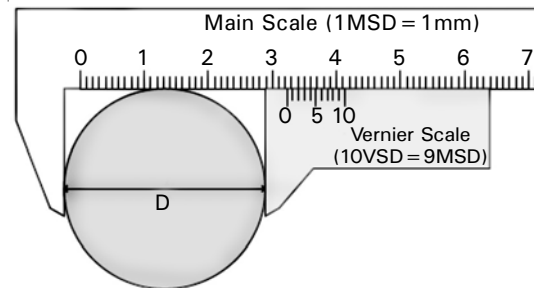
14. In a young's double slit experiment, the fringe width is found to be 0.4 mm. If the whole apparatus is immersed in water of refractive index $4/3$, without disturbing the geometrical arrangement, the new fringe width will be

(1) 0.3 mm (2) 0.4 mm
 (3) 0.53 mm (4) 450 microns

15. A ship A is travelling due north with speed of 10 m/s. Another ship B is travelling due east with a speed of 10 m/s. The displacement of B as seen from A is in the direction

(1) north-west (2) north-east
 (3) south-west (4) south-east

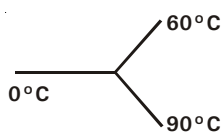
16.



Zero error of the vernier callipers shown in figure is -0.2 mm. Diameter of the sphere being measured is

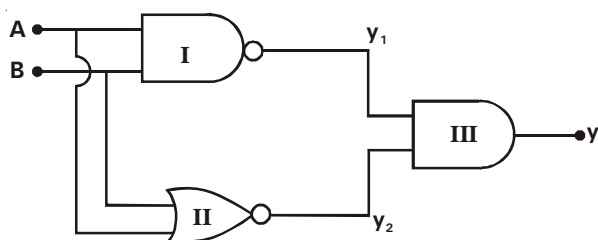
(1) 3.21 cm (2) 3.23 cm
 (3) 3.20 cm (4) 3.25 cm

17. Three rods made of same material and having the same cross-section have been joined as shown in figure. Each rod is of the same length. The left and right ends are kept at 0°C , 60°C and 90°C respectively. The temperature of junction of three rods will be



- (1) 50°C (2) 60°C
 (3) 40°C (4) 45°C
18. If mass of each molecule of a gas is halved & speed is doubled, the ratio of initial and final pressure will be
 (1) 2 : 1 (2) 1 : 1
 (3) 1 : 2 (4) 1 : 4
19. Let n_e and v_d be the number and drift velocity of conduction electrons in a semiconductor. When the temperature is increased,
 (1) n_e increases and v_d decreases
 (2) n_e decreases and v_d increases
 (3) both n_e and v_d increase
 (4) both n_e and v_d decrease

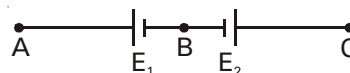
20.



From the truth table of combination of gates as shown, name the gate so obtained.

- (1) AND Gate (2) NOR Gate
 (3) NAND Gate (4) OR gate

21.

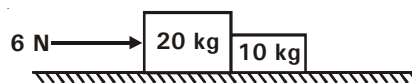


Two cells of emf E_1 and E_2 are connected as shown in the figure. When a potentiometer is connected between A and C, balancing length is x . When the same potentiometer is connected between A and B, balancing length is $4x$. Then

$\frac{E_1}{E_2}$ is

- (1) $\frac{4}{3}$ (2) $\frac{3}{2}$
 (3) $\frac{5}{3}$ (4) 2

22.



As shown in figure above, two blocks are placed in contact on a smooth table. A horizontal force of 6 N is applied on 20 kg block. With what force does 20 kg block press the 10 kg block?

- (1) 0.5 N (2) 1 N
 (3) 4 N (4) 2 N

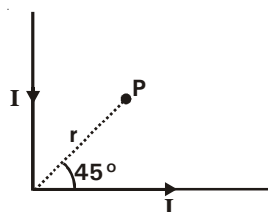
23. Two particles A and B of equal masses have velocities (in m/s) $\vec{v}_A = 2\hat{i} + \hat{j}$ and $\vec{v}_B = -\hat{i} + 2\hat{j}$. The particles move with accelerations (in m/s^2) $\vec{a}_A = -4\hat{i} - \hat{j}$ and $\vec{a}_B = -2\hat{i} + 3\hat{j}$ respectively. The centre of mass of the two particles moves along
 (1) a straight line (2) a parabola
 (3) a circle (4) an ellipse

24. In a circuit L, C and R are connected in series with an alternating voltage source of frequency f . The current leads the voltage by 45° . The value of C is

- (1) $\frac{1}{2\pi f(2\pi fL - R)}$ (2) $\frac{1}{\pi f(2\pi fL - R)}$
 (3) $\frac{1}{2\pi f(2\pi fL + R)}$ (4) $\frac{1}{\pi f(2\pi fL + R)}$

25. Vibration magnetometer before use, should be set
- in magnetic meridian
 - in geographical meridian
 - perpendicular to magnetic meridian
 - in any position
26. **Assertion** : An amperian loop for applying Ampere's law must be conducting.
Reason : Only conductors can carry current and thus produce magnetic field.
- Both Assertion and Reason are true and the reason is the correct explanation of the assertion
 - Both Assertion and Reason are true but the reason is not the correct explanation of the assertion
 - Assertion is true statement but Reason is false
 - Assertion is false
27. The height above the earth surface at which the weight of a body becomes half of its value at earth surface is
- $\sqrt{2}$ times the radius of earth
 - $\frac{1}{\sqrt{2}}$ times the radius of earth
 - $(\sqrt{2} - 1)$ times the radius of earth
 - $\frac{1}{(\sqrt{2} - 1)}$ times the radius of earth
28. A proton is moving in a circular orbit in a magnetic field with kinetic energy 3 MeV. What should be the kinetic energy of an α -particle, so that it can revolve in a circular path of tripple the radius in the same field?
- 18 MeV
 - 9 MeV
 - 27 MeV
 - 36 MeV

29.



Find the magnetic field at point P due to two semi-infinite wires joined as shown in the above diagram.

- $\frac{\mu_0 I(\sqrt{2} + 1)}{4\pi r} \otimes$
 - $\frac{\mu_0 I(\sqrt{2} + 1)}{4\pi r} \odot$
 - $\frac{\mu_0 I(\sqrt{2} + 1)}{2\pi r} \otimes$
 - $\frac{\mu_0 I(\sqrt{2} + 1)}{2\pi r} \odot$
30. A hollow metal block of mass 180 gram contains a cavity inside. It weighs 120 grams in a liquid of density 1.8 gram/cc. If specific gravity of metal is 6, the volume of cavity is
- 3.33 cc
 - 2.5 cc
 - 1.8 cc
 - 2.67 cc
31. The frequency of the first line in Lyman series in the hydrogen spectrum is ν . What is the frequency of the second line of Balmer series in the spectrum of doubly ionized Lithium?
- 1.5 ν
 - 2.5 ν
 - 3 ν
 - 2.25 ν
32. A man on a railway platform hears sounds of whistle from two trains, one coming and one going, each at 36 km/hr. If he hears 8 beats/s, original frequency of each whistle, assumed same for both trains, is (speed of sound is 320 m/s)
- 116 Hz
 - 120 Hz
 - 124 Hz
 - 128 Hz

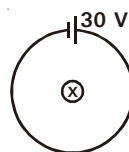
33. A machine which is 75 percent efficient, uses 12 joules of energy in lifting up a 1 kg mass through a certain distance. The velocity at the end of its fall is
 (1) $\sqrt{24} \text{ ms}^{-1}$ (2) $\sqrt{32} \text{ ms}^{-1}$
 (3) $\sqrt{18} \text{ ms}^{-1}$ (4) $\sqrt{9} \text{ ms}^{-1}$
34. Different objects at different distances are seen by the eye. the parameter that remain constant is
 (1) the focal length of eye lens
 (2) the object distance from the eye lens
 (3) the radii of curvature of the eye lens
 (4) the image distance from the eye lens
35. If the resultant of external forces acting on a system is zero, then the centre of mass of the system
 (1) does not move
 (2) does not accelerate
 (3) might be moving on a circle
 (4) might be accelerating
38. 5 ampere conventional current enters an aluminium sphere and 2 ampere leaves from the other side. The rate of change of electric flux coming out of the sphere (in SI units) is
 (1) 3 (2) 7
 (3) $\frac{3}{\epsilon_0}$ (4) $\frac{7}{\epsilon_0}$
39. There is a hole at the bottom of a cylindrical vessel. Water is filled upto a height H which flows out in time 't'. If water is filled to a height 4H, three fourth of it will flow out in time
 (1) 0.5 t (2) 2t
 (3) 0.75 t (4) t
40. Powers of the objective and eye lens of a Gallilean telescope are respectively +1D and -10 D. Then for relaxed vision, the length of the telescope and magnification obtained will be
 (1) 90 cm and 10 (2) 110 cm and 10
 (3) 80 cm and 20 (4) 50 cm and 15
41. If a satellite is orbiting the earth very close to its surface, then orbital velocity mainly depends on
 (1) mass of the satellite
 (2) radius of the earth
 (3) Both (1) & (2)
 (4) Neither (1) nor (2)

PHYSICS : SECTION-B

This section has 15 questions, attempt any 10 questions of them.

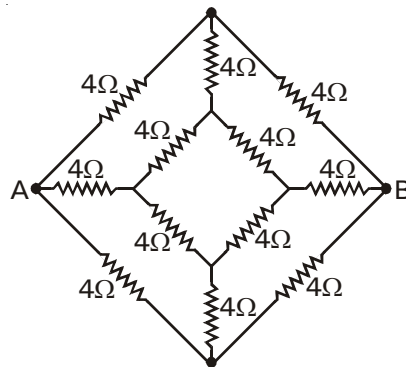
36. A uniform electric field having a magnitude E_0 and direction along the positive x-axis exists. If the potential V is zero at $x = 0$, then its value at $X = 5$ m will be
 (1) $V_{(x)} = +5 E_0$ (2) $V_x = -5 E_0$
 (3) $V_x = +25 E_0$ (4) $V_x = -25 E_0$
37. The true statement is
 (1) The order of colours in the primary and the secondary rainbows is the same
 (2) The intensity of colours in the primary and the secondary rainbows is the same
 (3) The intensity of light in the primary rainbow is greater and the order of colours is the same than the secondary rainbow
 (4) The intensity of light for different colours in primary rainbow is greater and the order of colours is reverse than the secondary rainbow

42.



Given area of loop is 1 m^2 and its resistance 2Ω . Uniform magnetic field crossing the loop as shown is increasing with time as 50 T/s . Magnitude & direction of current in loop
 (1) 10 A clockwise (2) 10A anticlockwise
 (3) 40 A clockwise (4) 40A anticlockwise

43. Which of the following statements in connection with a semiconducting material is not correct?
- They have negative temperature coefficient of resistance
 - They have a moderate forbidden energy gap
 - Current is carried by electrons and holes both
 - Every semiconducting material is a tetravalent element
44. A river is flowing from west to east at a speed of 3m/min. In what direction should a man on the south bank of the river capable of swimming at 5 m/min in still water should swim to cross the river along shortest path?
- north
 - 30° east of north
 - 30° west of north
 - 37° west of north
45. When 1 cc of water is converted into steam at 100°C, the work done against the atmospheric pressure is nearly
- 40 cal
 - 540 cal
 - 536 cal
 - 80 cal
46. A cricket fielder, while running with speed u , throws the cricket ball with a speed v_0 at an angle θ to the horizontal. Then distance from the point of projection at which the ball will land will be
- $\frac{2(u + v_0 \cos \theta)v_0 \sin \theta}{g}$
 - $\frac{2(u + v_0 \sin \theta)v_0 \cos \theta}{g}$
 - $\frac{(u + v_0 \cos \theta)v_0 \sin \theta}{g}$
 - $\frac{(u + v_0 \sin \theta)v_0 \cos \theta}{g}$
47. **Statement-I** : Boron rods in nuclear reactor are used as a control rods.
Statement-II : Molybdenum is used as a target element for production of X-rays because it is a heavy element and can easily absorb high velocity electrons.
- Both statement-I and statement-II are correct
 - Both statement-I and statement-II are incorrect
 - Statement-I is correct but statement-II is incorrect
 - Statement-I is incorrect but statement-II is correct
48. A log of wood of mass 120 kg floats in water. Weight that can be put on the raft to make it just sink, should be (density of wood = 600 kg/m³)
- 80 kg
 - 50 kg
 - 60 kg
 - 30 kg
- 49.





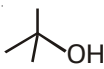
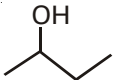
Twelve identical wires each of resistance 4Ω are connected as shown in figure. Effective resistance of the circuit between points A and B is

- 4Ω
- 3Ω
- 2Ω
- 1Ω

50. A potential difference $V = (10 \pm 0.25)$ volts applied on a conductor produces a current $I = (2 \pm 0.2)$ amperes. The resistance R of the conductor is
 (1) (5 ± 0.45) ohm (2) (5 ± 0.6) ohm
 (3) (5 ± 0.4) ohm (4) (5 ± 0.5) ohm

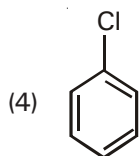
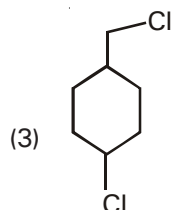
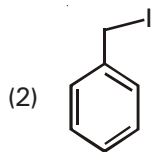
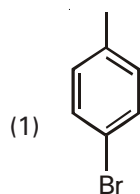
CHEMISTRY : SECTION-A

All questions are compulsory in section A

51. Which of the following has a square planar shape?
 (1) XeF_4 (2) SCl_4
 (3) BF_4^- (4) NH_4^+
52. The maximum number of 90° angles between bond pairs of electrons is observed in
 (1) sp^3d hybridisation (2) sp^3d^3 hybridisation
 (3) sp^3d^2 hybridisation (4) dsp^2 hybridisation
53. The ratio of velocity of the electron in the 3rd and 5th orbit of Li^{2+} is
 (1) 3 : 5 (2) 5 : 3
 (3) 25 : 9 (4) 9 : 25
54. Which of these will give turbidity immediately with anhyd $\text{ZnCl}_2/\text{conc. HCl}$?
 (1)  (2) 
 (3)  (4) 
55. Which of following set contain groups showing +R effect only?
 (1) $-\text{COOH}$, $-\text{CHO}$, $-\text{CN}$, NO_2
 (2) $-\text{OH}$, $-\text{OR}$, $-\text{CHO}$, $-\text{NR}_2$
 (3) $-\text{NHR}$, $-\text{NR}_2$, $-\text{OR}$, $-\text{OH}$, $-\text{NH}_2$
 (4) $-\text{COOH}$, NR_2 , NHR , $-\text{OH}$
56. Mg in solid state is
 (1) n-type semi conductor
 (2) p-type semi conductor
 (3) electronic conductor
 (4) electrolytic conductor

57. The oxidant in the reaction
 $\text{Cr}_2\text{O}_7^{2-} + \text{H}_2\text{S} \rightarrow \text{Cr}^{+3} + \text{S}$ is
 (1) H_2S (2) $\text{Cr}_2\text{O}_7^{2-}$
 (3) Cr^{+3} (4) S
58. Synthetic rubber which resembles natural rubber
 (1) neoprene (2) chloroprene
 (3) glyptal (4) nylon
59. For the reaction $2\text{A} + 3\text{B} \rightarrow \text{x C}$, rate of formation of C is expressed as $\frac{d[\text{C}]}{dt} = -3 \frac{d[\text{A}]}{dt}$, the value of x is
 (1) 2 (2) 1.5
 (3) 6 (4) 1
60. 0.301 g of an organic compound gave 0.282 g of AgBr by carius method. The % of Br is
 (1) 39.87 (2) 80.34
 (3) 70.20 (4) 30.24
61. In pyrophosphorous acid ($\text{H}_4\text{P}_2\text{O}_5$) oxidation state of phosphorous and basicity is
 (1) +3, 2 (2) +3, 4
 (3) +5, 2 (4) +5, 4
62. The vapour pressure of the solution of two liquids A ($p^\circ = 80$ mm) and B ($p^\circ = 120$ mm) is found to be 100 mm when $x_A = 0.4$. The result shows that
 (1) solution exhibits ideal behaviour
 (2) solution shows positive deviation
 (3) solution shows negative deviation
 (4) solution will show positive deviation for lower concentrations and negative deviation for higher concentrations

63. Which of the following will give yellow precipitate on shaking with aqueous NaOH followed by acidification with dilute HNO_3 and addition of AgNO_3 solution?

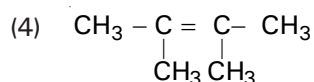
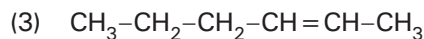
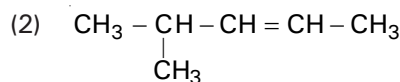
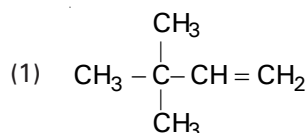


64. **Assertion** : Hydrolysis of XeF_6 is not a redox reaction.

Reason : In XeF_6 , Xe can increase as well as decrease its oxidation state.

- (1) Both Assertion and Reason are true and the reason is the correct explanation of the assertion
 (2) Both Assertion and Reason are true but the reason is not the correct explanation of the assertion
 (3) Assertion is true statement but Reason is false
 (4) Assertion is false
65. Which of the following ions will exhibit colour in aqueous solution?
- (1) Ti^{3+} (Z = 22) (2) Lu^{3+} (Z = 71)
 (3) Sc^{3+} (Z = 21) (4) La^{3+} (Z = 57)

66. Which of the following alkenes on hydrogenation gives neohexane?



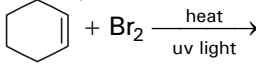


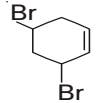
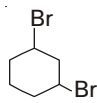
67. Suppose 1 mole of each of NH_3 , CO_2 , N_2 & O_2 are enclosed in a closed vessel containing charcoal (as adsorbent) then after some time partial pressure will be minimum for

- (1) CO_2 (2) O_2
 (3) NH_3 (4) N_2

68. Match the molecules in Column I with their number of sigma bonds in Column II

Column I	Column II
a. XeO_3F_2	i. 6
b. XeO_2F_2	ii. 4
c. XeOF_4	iii. 5
d. XeO_6^{4-}	iv. 7

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

69. A small quantity of FeCl_3 is added to freshly prepared $\text{Fe}(\text{OH})_3$ precipitate, when a reddish brown positively charged sol is formed. The phenomenon is called
 (1) Cataphoresis (2) Dialysis
 (3) Emulsification (4) Peptization
70. The pressure of gas obeying van der waals equation is
 (1) Smaller than that of ideal gas
 (2) Larger than that of an ideal gas
 (3) Same as that of ideal gas
 (4) None of these
71. Which of the following oxides is acidic?
 (1) B_2O_3 (2) Al_2O_3
 (3) Ga_2O_3 (4) In_2O_3
72. In a multi-electron atom, which of the following orbitals will have the same energy in the absence of magnetic and electric fields?
 a. $n=1, l=0, m=0$
 b. $n=2, l=0, m=0$
 c. $n=3, l=2, m=0$
 d. $n=3, l=2, m=+1$
 (1) both a and b (2) both c and d
 (3) b, c and d (4) a, b and c
73. $t_{1/2}$ of a first order reaction is 60 minutes. The % left after 240 minutes is
 (1) 6.25% (2) 4%
 (3) 94.75% (4) 96%
74. Out of the following given compounds which of the following can give Cannizzaro reaction?
 (a) $\text{H}-\overset{\text{O}}{\parallel}{\text{C}}-\text{H}$ (b) $\text{C}_6\text{H}_5-\text{CHO}$
 (c) $(\text{CH}_3)_3\text{C}-\text{CHO}$ (d) CCl_3-CHO
 (e) $\text{C}(\text{Ph})_3-\text{CHO}$ (f) $\text{Ph}-\text{CH}_2-\overset{\text{O}}{\parallel}{\text{C}}-\text{H}$
 (1) a, b, c, d (2) a, b, c, d, e
 (3) a, b, c, f (4) a, b, c
75. Which of the following conversions can be carried out by Clemmensen Reduction?
 a. Benzaldehyde into benzyl alcohol
 b. Cyclohexanone into cyclohexane
 c. Benzoyl chloride into benzaldehyde
 d. Benzophenone into diphenyl methane
 (1) Both a & b (2) Both c & d
 (3) Both b & d (4) only c
76. If K_{a1} , K_{a2} and K_{a3} are the respective ionisation constants for the following reactions
 $\text{H}_2\text{S} \rightleftharpoons \text{H}^+ + \text{HS}^-$; $\text{HS}^- \rightleftharpoons \text{H}^+ + \text{S}^{2-}$
 $\text{H}_2\text{S} \rightleftharpoons 2\text{H}^+ + \text{S}^{2-}$
 (1) $K_{a3} = K_{a1} \times K_{a2}$ (2) $K_{a3} = K_{a1} + K_{a2}$
 (3) $K_{a3} = K_{a1} - K_{a2}$ (4) $K_{a3} = K_{a1} / K_{a2}$
77. The reduction potential of a hydrogen electrode at pH 10 is
 (1) 0.519 V (2) 0.00 V
 (3) -0.591 V (4) 0.059 V
78.  + $\text{Br}_2 \xrightarrow[\text{uv light}]{\text{heat}}$
 The product of the reaction is
 (1)  (2) 
 (3)  (4) 
79. Which of the following layering pattern will have a void fraction of 0.26?
 (1) ABCCBAABC (2) ABBAABBA
 (3) ABCABCABC (4) ABCAABCA
80. The tetrahedral field splitting is only _____ of octahedral splitting
 (1) 1/9 (2) 2/9
 (3) 4/9 (4) 5/9

81. **Statement-I** : The thermodynamic parameters for the reaction at 273 K. $\text{H}_2\text{O(s)} \longrightarrow \text{H}_2\text{O(l)}$ are $\Delta G = 0$, $\Delta H = +ve$, $\Delta S = +ve$ respectively.

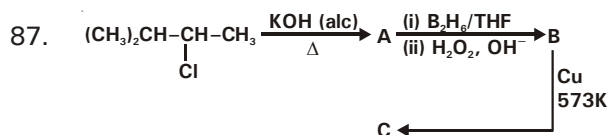
Statement-II : The melting of ice into liquid water is spontaneous process above 273K.

- (1) Both statement-I and statement-II are correct
 (2) Both statement-I and statement-II are incorrect
 (3) Statement-I is correct but statement-II is incorrect
 (4) Statement-I is incorrect but statement-II is correct
82. The H—H bond energy is 430 kJ/mol and Cl—Cl bond energy is 240 kJ/mol. $\Delta_f H$ for HCl is -90 kJ. The H—Cl bond energy is about
 (1) 180 kJ/mol (2) 360 kJ/mol
 (3) 213 kJ/mol (4) 425 kJ/mol
83. Wilkinson's catalyst contains
 (1) rhodium (2) iron
 (3) aluminium (4) cobalt
84. Which of the carbonates given below is unstable in air and is kept in CO_2 atmosphere to avoid decomposition?
 (1) BeCO_3 (2) MgCO_3
 (3) CaCO_3 (4) BaCO_3
85. Which one of the following complexes is outer orbital complex?
 (1) $[\text{Co}(\text{NH}_3)_6]^{+3}$ (2) $[\text{Fe}(\text{CN})_6]^{-3}$
 (3) $[\text{Fe}(\text{CN})_6]^{-4}$ (4) $[\text{Ni}(\text{NH}_3)_6]^{+2}$

CHEMISTRY : SECTION-B

This section has 15 questions, attempt any 10 questions of them.

86. Which of the following aqueous solutions should have the highest boiling point?
 (1) 1.0 M NaOH (2) 1.0 M Na_2SO_4
 (3) 1.0 M NH_4NO_3 (4) 1.0 M KNO_3



The product C will give

- (1) Blue colour in Victor meyer test
 (2) Turbidity at room temperature in Lucas test
 (3) Iodoform test positive
 (4) Tollen's test positive
88. **Assertion** : $\text{CH}_2 = \underset{\text{O}}{\underset{\parallel}{\text{C}}} - \text{H}$ is lesser reactive

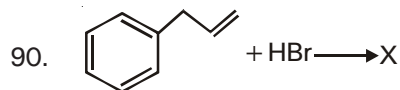
than $\text{CH}_3\text{CH}_2 - \underset{\text{O}}{\underset{\parallel}{\text{C}}} - \text{H}$ for nucleophilic addition on carbonyl carbon.

Reason : Vinyl group exerts +R effect.

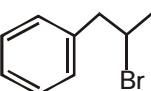
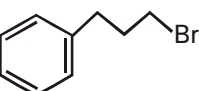
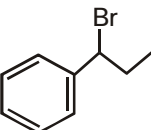
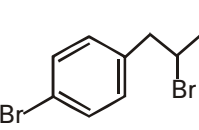
- (1) Both Assertion and Reason are true and the reason is the correct explanation of the assertion
 (2) Both Assertion and Reason are true but the reason is not the correct explanation of the assertion
 (3) Assertion is true statement but Reason is false
 (4) Assertion is false

89. The compound X on heating gives a colourless gas. The residue is dissolved in water to obtain Y, Excess CO_2 is bubbled through aqueous solution of Y, Z is formed. Z on gentle heating gives back X. The compound X is

- (1) CaCO_3 (2) Na_2CO_3
(3) $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ (4) K_2CO_3



In the above reaction, X is

- (1)  (2) 
(3)  (4) 

91. Match the reactions in column I with their types in column II

- | Column-I | Column-II |
|---|----------------------------------|
| (i) $(\text{NH}_4)_2\text{Cr}_2\text{O}_7 \rightarrow \text{N}_2 + \text{Cr}_2\text{O}_3 + 4\text{H}_2\text{O}$ | a. Intermolecular redox reaction |
| (ii) $\text{PbO}_2 + \text{H}_2\text{O} \rightarrow \text{PbO} + \text{H}_2\text{O}_2$ | b. Disproportionation |
| (iii) $\text{Cr}_2\text{O}_3 + 2\text{Al} \rightarrow \text{Al}_2\text{O}_3 + 2\text{Cr}$ | c. Intramolecular redox reaction |
| (iv) $\text{Cl}_2 + 2\text{OH}^- \rightarrow \text{Cl}_2\text{O}^- + \text{Cl}^- + \text{H}_2\text{O}$ | d. Metal displacement |
- (1) (i)–c ; (ii)–a ; (iii)–a,d ; (iv)–b
(2) (i)–a ; (ii)–c ; (iii)–d ; (iv)–b
(3) (i)–b ; (ii)–a ; (iii)–a,d ; (iv)–c
(4) (i)–a,b ; (ii)–c ; (iii)–a,d ; (iv)–b

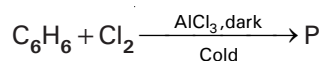
92. Which of the following reaction represent correct product formation ?

- (1) $\text{ROH} + \text{NaBr} \rightarrow \text{RBr} + \text{NaOH}$
(2) $(\text{CH}_3)_3\text{C-Br} + \text{CH}\equiv\text{CNa} \rightarrow \text{CH}\equiv\text{C-C(CH}_3)_3$
(3) $\text{R-2-Bromo octane} \xrightarrow[\text{acetone}]{\text{NaI}} \text{A} \xrightarrow[\text{C}_2\text{H}_5\text{OH}]{\text{NaSH}} \text{R-2-octane thiol}$
(4) $\text{CH}_2=\text{CH-Cl} \xrightarrow{\text{NaNH}_2} \text{CH}_2=\text{CH-NH}_2$

93. The incorrect statement about lanthanoids is/are

- a. They have typical metallic structure and are good conductor of heat and electricity
b. Earlier members of lanthanoid series shows similar chemical reactivity as Ca.
c. Ce^{4+} and Lu^{3+} shows paramagnetism
d. Eu^{3+} is a good reducing agent
(1) a & b (2) b & c
(3) c & d (4) b & d

94. What is not correct for the product formed in following reaction?



- (1) Its formula is $\text{C}_6\text{H}_6\text{Cl}_6$
(2) Its formula is C_6Cl_6
(3) It is an aromatic compound
(4) It is formed after electrophilic substitution

95. **Statement-I** : The primary precursors of photochemical smog are NO_2 , O_3 and hydrocarbons. **Statement-II** : Secondary precursors of photochemical smog are ozone and PAN.

- (1) Both statement-I and statement-II are incorrect
(2) Both statement-I and statement-II are correct
(3) Statement-I is correct but statement-II is incorrect
(4) Statement-I is incorrect but statement-II is correct

96. Two open beakers one containing a solvent and the other containing a mixture of that solvent with a non-volatile solute are placed together in a bell jar. Over the time
- Volume of the solution decreases and the volume of the solvent increases
 - Volume of the solution does not change and the volume of the solvent decreases
 - Volume of the solution increases and the volume of the solvent decreases
 - Volume of the solution and the solvent does not change
97. A complex dichlorobis(ethylene diamine) chromium (III)chloride has X number of total stereoisomeric forms. X will be
- 2
 - 4
 - 3
 - 1
98. Consider following diagram and choose the incorrect statement
-
- Fe and C do not show any phase transition
 - At high temperature C is the best reducing agent for the oxides of Ag, Cu, Fe
 - Below point M, Cu can reduce the oxide of Ag
 - Above point M, Ag can reduce the oxide of Fe
99. Analyse the following statement
- Λ_m^0 for weak electrolytes is obtained by using Kohlrausch law.
 - At infinite dilution electrolyte dissociates completely and $\alpha = 1$
 - At any concentration, α can be approximated to the ratio of limiting molar conductivity to the molar conductivity at that concentration.
- The correct statement are
- a, b & c
 - b & conly
 - a & b only
 - a & c only
100. In SF_4 molecule, how many lp-bp repulsions are significant?
- 1
 - 2
 - 4
 - 6
102. The ciliated epithelial cells are required to move particles or mucus in a specific direction. In humans, these cells are mainly present in
- Bile duct and Bronchioles
 - Fallopian tubes and Pancreatic duct
 - Eustachian tube and Salivary duct
 - Bronchioles and Fallopian tubes
103. The space between lens and retina is called _____ chamber and is filled with _____.
- aqueous, thin water fluid
 - vitreous, opaque gel
 - aqueous, thick fluid
 - vitreous, transparent gel
104. At what stage of the cell cycle are histone proteins synthesised in a eukaryotic cell?
- G_2 -stage of prophase
 - S-phase
 - Entire prophase
 - Telophase
105. The purplish red pigment rhodopsin contained in the rods, type of photoreceptor cells of the human eye, is a derivative of
- Vitamin A
 - Vitamin B1
 - Vitamin C
 - Vitamin D
106. Which of the following disease is spread by mosquito but is not caused by virus?
- Amoebiasis
 - Dengue fever
 - Chickungunya
 - Filariasis
107. When a neuron is in resting state i.e., not conducting any impulse, the axonal membrane is
- Comparatively more permeable to Na^+ ions and nearly impermeable to K^+ ions
 - Equally permeable to both Na^+ and K^+ ions
 - Impermeable to both Na^+ and K^+ ions
 - Comparatively more permeable to K^+ ions and nearly impermeable to Na^+ ions
108. Uricotelic mode of passing out nitrogenous wastes is found in
- Insects and Amphibians
 - Reptiles and Birds
 - Birds and Annelids
 - Amphibians and Reptiles
109. Smooth muscles are
- involuntary, fusiform, non-striated
 - voluntary, multinucleate, cylindrical
 - involuntary, cylindrical, striated
 - voluntary, spindle-shaped, uninucleate
110. The cockroach body inspite of being covered by an exoskeleton of strong chitinous cuticle still remains flexible due to
- Tergites
 - Sternites
 - Pleuritis
 - Arthrodial membrane

ZOOLOGY : SECTION-A

All questions are compulsory in section A

101. Elbow joint is an example of:
- hinge joint
 - gliding joint
 - ball and socket joint
 - pivot joint

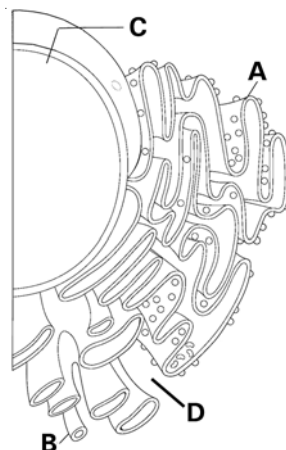
111. Which enzyme is responsible for the conversion of inactive fibrinogens to fibrins?
 (1) Thrombin (2) Renin
 (3) Epinephrine (4) Thrombokinas
112. Which of the following is not involved in digestion in humans?
 (1) Duodenum (2) Jejunum
 (3) Ileum (4) Caecum
113. **Statement-I** : Heart beat rate of an individual can be determined by counting the number of QRS complexes in a given time period.
Statement-II : For a given lead configuration, ECG obtained from different individuals is roughly of same shape.
 (1) Both statement-I and statement-II are correct
 (2) Both statement-I and statement-II are incorrect
 (3) Statement-I is correct but statement-II is incorrect
 (4) Statement-I is incorrect but statement-II is correct
114. Closed circulatory system is more advantageous than open because
 (1) it carries more oxygenated blood to the body
 (2) it does not need a pumping organ
 (3) flow of blood is precisely regulated
 (4) it helps to increase metabolic rate
115. Which event is correctly matched to its site of occurrence in human female?
 (1) Fertilisation - uterus
 (2) Release of 1st polar body - oviduct
 (3) Ovulation - ovary
 (4) Insemination - cervix
116. Which of the following is an incorrect difference between starch and cellulose?

Starch

Cellulose

- | | |
|---|--------------------------------|
| (1) Has secondary helical structure | Unbranched structure |
| (2) Gives blue colour with iodine | Gives no colour with iodine |
| (3) Present as a store house of energy in plant tissues | Forms plant cell walls |
| (4) Homopolymer found in filtrate | Homopolymer found in retentate |
117. Which of the following is responsible for causing ringworm disease, the most common infectious disease in man?
 (1) *Microsporum* (2) *Trichophyton*
 (3) *Epidermophyton* (4) All of these
118. Under normal physiological conditions in human beings, every 100 ml of oxygenated blood can deliver _____ ml of O_2 to the tissues.
 (1) 2m (2) 5 ml
 (3) 4 ml (4) 10 ml

119. Competitive inhibitor of succinate for the inhibition of succinate dehydrogenase is
 (1) oxaloacetate (2) malonate
 (3) fumarate (4) acetate
120. Identify the components labelled A, B, C and D in the given diagram respectively

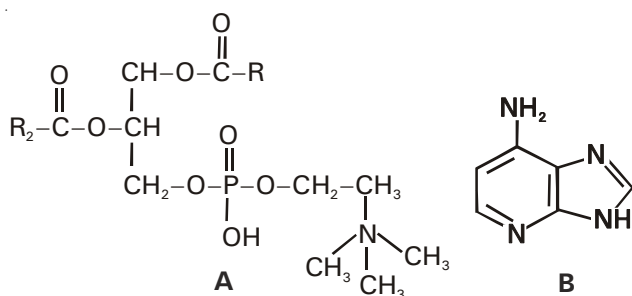


- (1) RER, SER, nucleus, cytoplasm
 (2) SER, nucleus, cytoplasm, RER
 (3) SER, RER, nucleus, cytoplasm
 (4) cytoplasm, SER, RER, nucleus
121. A person likely to develop tetanus is immunised by administering:
 (1) Preformed antibodies
 (2) Wide spectrum antibiotics
 (3) Weakened germs
 (4) Dead germs
122. Select the mis-match w.r.t. the name of animal, its two characters and its class

(1)	<i>Petromyzon</i>	i. Body devoid of scales ii. Paired fins	Cyclostomata
(2)	<i>Crocodylus</i>	i. 4 chambered heart ii. Dry cornified skin	Reptilia
(3)	<i>Clarius</i>	i. Cycloid scales ii. Operculum	Osteichthyes
(4)	<i>Neophron</i>	i. Oviparous ii. Feathery biped	Aves

123. Catecholamines are responsible for
 (1) inhibition of break down of glycogen, lipids and proeins
 (2) dilation of pupils and sweating
 (3) regulation of water and electrolyte balance in body
 (4) producing anti-inflammatory reactions

124. Which of the following structural formulae of two organic compounds is correctly identified along with its related function ?



- (1) B : Adenine – A nucleotide that makes up nucleic acids
 (2) A: Triglyceride – major source of energy
 (3) B-Uracil – A component of DNA
 (4) A : Lecithin – A component of cell membrane
125. Infertility cases which are either due to inability of male partner to inseminate the female or due to azoospermia could be corrected by
 (1) AI, IUI, ICSI, LNG (2) GIFT, IUI, AI, ZIFT
 (3) IUT, ET, IVF, AI (4) AI, IUI, ICSI
126. Which of the following statement is correct?
 (1) By using *Agrobacterium*, nematode specific ds RNA is introduced into host plant
 (2) *Bacillus thuringiensis* forms protein crystals that get activated in its particular phase of growth
 (3) C-peptide is not present in mature insulin
 (4) All are correct
127. Among the human ancestors the brain size was more than 1000 CC in
 (1) *Homo erectus*
 (2) *Ramapithecus*
 (3) *Homo habilis*
 (4) *Homo neanderthalensis*
128. Select the correct statement from the following?
 (1) Fitness is the end result of the ability to adapt and get selected by nature
 (2) All mammals except whales and camels have seven cervical vertebrae
 (3) Mutations are random and directional
 (4) Darwinian variations are small and directionless
129. The genetic defect - adenosine deaminase (ADA) deficiency may be cured permanently by:
 (1) administering adenosine deaminase activators.
 (2) introducing bone marrow genes producing ADA into cells at early embryonic stages.
 (3) enzyme replacement therapy.
 (4) periodic infusion of genetically engineered lymphocytes having functional ADA cDNA.

130. Now a days it is possible to detect the mutated gene causing cancer by allowing radioactive probe to hybridise its complementary DNA in a clone of cells, followed by its detection using autoradiography because
 (1) mutated gene does not appear on photographic film as the probe has complementarity with it
 (2) mutated gene partially appears on a photographic film
 (3) mutated gene completely and clearly appears on a photographic film
 (4) mutated gene does not appear on a photographic film as the probe has no complementarity with it
131. Which free living fungi are very common in root ecosystem and are very effective as biocontrol agents of several plant pathogens?
 (1) *Nucleopolyhedro fungi* (2) *Trichoderma*
 (3) *Oscillatoria* (4) *Anabaena*
132. Auto immune disease affecting neuromuscular junction leading to fatigue, weakening and paralysis of skeletal muscle is
 (1) Muscular dystrophy (2) Arthritis
 (3) Myasthenia gravis (4) Tetany
133. Mark the incorrect statement about restriction endonuclease?
 (1) Restriction endonuclease functions by inspecting the length of DNA sequence
 (2) It binds to specific sequence of DNA and cut one of the two strands of the double helix
 (3) It recognizes a specific palindromic nucleotide sequences in the DNA
 (4) They act as molecular scissors
134. **Assertion** : The movements of basilar membrane bend the hair cells, pressing them against the tectorial membrane.
Reason : Sound vibrations that passed through the oval window generate waves in lymph of cochlea.
 (1) Both Assertion and Reason are true and the reason is the correct explanation of the assertion
 (2) Both Assertion and Reason are true but the reason is not the correct explanation of the assertion
 (3) Assertion is true statement but Reason is false
 (4) Assertion is false
135. Given below is a sample of a portion of DNA strand giving the base sequence on the opposite strands. What is so special shown in it?
 5'-----GAATTC-----3'
 3'-----CTTAAG-----5'
 (1) Replication completed
 (2) Deletion of mutation
 (3) Start codon at the 5' end
 (4) Palindromic sequence of base pairs

ZOOLOGY : SECTION-B

This section has 15 questions, attempt any 10 questions of them.

136. Which of the following options cannot be considered as regulation of cardiac activity by parasympathetic nervous system?
- (1) decrease in rate of heart beat
 - (2) decrease in speed of conduction of action potential
 - (3) decrease in cardiac output
 - (4) increase in strength of ventricular contractions
137. The signals for parturition originate from:
- (1) fully developed foetus only
 - (2) placenta only
 - (3) placenta as well as fully developed foetus
 - (4) oxytocin released from maternal pituitary
138. Match the enzymes under column I with their use under column II
- | Column-I | Column-II |
|------------------|----------------------------------|
| a. Lipase | p. fibrinolysis |
| b. Pectinase | q. detergent formulation |
| c. Streptokinase | r. clarification of fruit juices |
- (1) a-q, b-r, c-p
 - (2) a-q, b-p, c-r
 - (3) a-r, b-q, c-p
 - (4) a-r, b-p, c-q
139. One example of animals having a single opening to the outside that serves both as mouth as well as anus is:
- (1) *Fasciola*
 - (2) *Octopus*
 - (3) *Asterias*
 - (4) *Ascidia*
140. How many of the following will be seen in most of Mollusca?
- Radula, Muscular foot, Mantle, Shell, Visceral hump, Parapodia, Jointed appendages.**
- (1) five
 - (2) four
 - (3) six
 - (4) three
141. Lungs are made up of air-filled sacs the alveoli. They do not collapse even after forceful expiration because of :
- (1) Residual Volume
 - (2) Inspiratory Reserve Volume
 - (3) Tidal Volume
 - (4) Expiratory Reserve Volume
142. Which of the following is correct w.r.t. *Entamoeba histolytica*?
- a. Constipation, abdominal pain
 - b. Cramps, stools with excess mucous and blood
 - c. House flies act as mechanical carrier
 - d. Parasite in large intestine
- (1) b & c
 - (2) a, b, d
 - (3) a, c, d
 - (4) a, b, c, d

143. Find the correct statement
- (1) Kwashiorkor is produced by protein deficiency accompanied by calorie deficiency
 - (2) Patient of Kwashiorkor shows wasting of muscles, thinning of limbs and failure of brain development
 - (3) Fat is left under the skin in marasmus child
 - (4) Odema is a feature of marasmus as well as Kwashiorkor
144. Which of the following statements are applicable to mycorrhizae?
- (1) Algae form symbiotic association with roots of higher plants
 - (2) Fungal symbiont in these associations absorb only calcium from soil and passes it to plants
 - (3) Many members of genus *Glomus* form this association
 - (4) This association reduces resistance to root borne pathogens
145. **Assertion** : By breathing or pulmonary ventilation atmospheric air is drawn in and CO₂ rich alveolar air is released out.
- Reason** : Utilization of O₂ by the cells for catabolic reactions and release of CO₂ occurs in cellular respiration.
- (1) Both Assertion and Reason are true and the reason is the correct explanation of the assertion
 - (2) Both Assertion and Reason are true but the reason is not the correct explanation of the assertion
 - (3) Assertion is true statement but Reason is false
 - (4) Assertion is false
146. In simple stirred tank bioreactor
- (1) steam and sterile air are pumped into the reactor
 - (2) bubbles increase the oxygen transfer area dramatically
 - (3) acid base port is present for pH control
 - (4) both (1) and (3)
147. Arrange the following in correct chronological sequence
- a. Increase in body fluid volume
 - b. Decrease in body fluid volume
 - c. Increased reabsorption of water from DCT and CD
 - d. Release of ADH
 - e. Activate osmoreceptors
- (1) b-d-c-e-a
 - (2) a-e-d-c-a
 - (3) a-d-c-e-b
 - (4) b-e-d-c-a

148. **Statement-I** : RNA interference takes place in all eukaryotic organisms as a method of cellular defense.
Statement-II : Transcription of DNA is prevented by RNA in RNA interference.
- (1) Both statement-I and statement-II are correct
 - (2) Both statement-I and statement-II are incorrect
 - (3) Statement-I is correct but statement-II is incorrect
 - (4) Statement-I is incorrect but statement-II is correct
149. Which of the following event does not occur during prophase-I in meiosis?
- (1) Crossing over between homologous chromosomes
 - (2) Pairing of homologous chromosomes
 - (3) Disjunction of chromosomes
 - (4) Formation of spindle fibres
150. Hisardale is a new breed of sheep developed in Punjab by crossing Bikaneri ewes and Marino rams. This type of breeding is known as
- (1) Inbreeding
 - (2) Cross-breeding
 - (3) Interspecific hybridisation
 - (4) Out crossing

BOTANY : SECTION-A

All questions are compulsory in section A

151. Main photosynthetic pigments of chlorophyceae are
- (1) chlorophyll b & c (2) chlorophyll a & b
 - (3) chlorophyll b & d (4) chlorophyll a & d
152. In hydrarch succession, which stage comes in between submerged plant stage and reed -swamp stage?
- (1) free floating plant stage
 - (2) scrub stage
 - (3) phytoplankton stage
 - (4) marsh meadow stage
153. How many of the following varieties are rice varieties?
Jaya, Kalyan sona, IR-36, Sonalika, Ratna, IR-8, Taichung native-1, Pusa Lerma, HD-1553
- (1) Three (2) Four
 - (3) Five (4) Six
154. Match the column
- | Column-I | Column-II |
|----------------------------|---------------------------------------|
| a. Mutualism | i. Sea anemone and clown fish |
| b. Parasitism | ii. Visiting flamingo resident fishes |
| c. Competition | iii. Malarial parasite |
| d. Comensalism | iv. Mycorrhizae |
| (1) a-i, b-iii, c-ii, d-iv | (2) a-iv, b-iii, c-ii, d-i |
| (3) a-iv, b-iii, c-i, d-ii | (4) a-ii, b-iv, c-i, d-iii |
155. Given one sequence is correct in sexual reproduction in plants.
- (1) Sporogenesis → gametogenesis → pollination → embryogenesis
 - (2) Sporogenesis → pollination → gametogenesis → embryogenesis
 - (3) Pollination → sporogenesis → gametogenesis → embryogenesis
 - (4) Pollination → gametogenesis → sporogenesis → embryogenesis
156. Single cell proteins are preferred because these
- (1) are better proteins
 - (2) reduce pressure on agricultural production
 - (3) are animal proteins
 - (4) all of these
157. Photosynthesis is divided into two parts, the light dependent reaction and the calvin cycle. Which of the given statement is true w.r.t. both?
- (1) During the light dependent reaction, there is fixation of CO₂ by using light energy
 - (2) The light dependent reaction occur in thylakoid lumen and calvin cycle in stromal lamella
 - (3) The dark reaction involves several protein complexes and pigments
 - (4) In stroma, enzymatic reactions synthesize sugar which is dependent on product of light reaction
158. Identify the root system shown below and seen in plant respectively



- (1) tap root system, mustard
 - (2) fibrous root system, maize
 - (3) adventitious root system, banyan
 - (4) tap root system, sugarcane
159. Which of the following statement is true?
- (1) Mango trees cannot grow in tropical countries like Canada and Germany
 - (2) Snow leopards are only found in Kerala forests
 - (3) Tuna fish are rarely found beyond tropical latitudes in oceans
 - (4) Mango trees can grow in temperate countries like Canada and Germany

160. **Statement- I** : In phylogenetic classification, it is assumed that organisms belonging to same taxa have common ancestry.
Statement- II : Bentham & Hooker's system of classification is also called practical classification
 (1) Both statement-I and statement-II are correct
 (2) Both statement-I and statement-II are incorrect
 (3) Statement-I is correct but statement-II is incorrect
 (4) Statement-I is incorrect but statement- II is correct
161. *Escherchia coli* has
 (1) 5386 nucleotides (2) 48502 bp
 (3) 3.3×10^9 bp (4) 4.6×10^6 bp
162. Which of the following has superior ovary from list given below?
Mustard, Guava, Peach, China rose, Plum, Rose, Cucumber, Brinjal
 (1) 3 (2) 7
 (3) 4 (4) 5
163. Which of the following is incorrect w.r.t.alleles of ABO system?
 (1) Allele (i) does not produce any sugar
 (2) A person will have only two of three alleles
 (3) When I^A and I^B are present together, they express same type of sugar
 (4) Gamete contains only one of three alleles
164. The store house of collected plant specimens that are dried, pressed and presented on sheets is
 (1) Herbarium (2) Botanical garden
 (3) Museum (4) Zoological park
165. The first species that invade a bare area are called
 (1) climax stage (2) seral stage
 (3) pioneer (4) transition stage
166. **Assertion** : In *Cucurbita*, there is no need of emasculation during artificial hybridization
Reason : In *Cucurbita* flowers are unisexual
 (1) Both Assertion and Reason are true and the reason is the correct explanation of the assertion
 (2) Both Assertion and Reason are true but the reason is not the correct explanation of the assertion
 (3) Assertion is true statement but Reason is false
 (4) Assertion is false
167. Which of the following statement is incorrect
 (1) Citrus canker, tetanus, cholera are diseases caused by bacteria
 (2) Mycoplasma are organisms that completely lack a cell wall
 (3) The bacteria that are found in extreme salty areas are called methanogens
 (4) Heterotrophic bacteria are helpful in making curd from milk.
168. In 1981, value of r for human population is
 (1) 0.0205 (2) 0.205
 (3) .00205 (4) 0.0502
169. **Statement-I** : Petiole help hold the leaf blade to light.
Statement-II : Veins of leaf provide rigidity to leaf blade and act as channel for transport for water, minerals & food.
 (1) Both statement-I and statement-II are correct
 (2) Both statement-I and statement-II are incorrect
 (3) Statement-I is correct but statement-II is incorrect
 (4) Statement-I is incorrect but statement-II is correct
170. Which one of the following is wrongly matched with its economic value and / or family ?
 (1) *Solanum tuberosum* → food plant → Solanaceae
 (2) *Lathyrus* → ornamental plant → fabaceae
 (3) *Gloriosa* → ornamental plant → Liliaceae
 (4) *Lupin* → ornamental plant → liliaceae
171. Which one of the following was not one of the important goals of HGP?
 (1) address the ELSI arising from the project
 (2) store the information in database
 (3) identify all the genes in human genome
 (4) develop method for DNA fingerprinting
172. Which of the following statement is true?
 (1) Boron toxicity leads to stout axis
 (2) Every mineral element that is present in a cell is needed by the cell
 (3) Nitrogen as a nutrient element, is highly immobile in the plants
 (4) It is not very easy to establish the essentiality of micronutrients because they are required only in trace quantities
173. Laminarin and mannitol, the reserve food of _____, are _____
 (1) Red algae, lipids
 (2) Brown algae, proteins
 (3) Red algae, complex carbohydrates
 (4) Brown algae, complex carbohydrates
174. Which of the following are characteristics of law of dominance?
 a. Characters are controlled by discrete units called factors.
 b. Factors occur in pair
 c. In a dissimilar pair of factors one member of pair dominates the other
 d. There are two factors for a character in a gamete
 (1) a, b, d (2) c, d
 (3) b, d (4) a, b, c

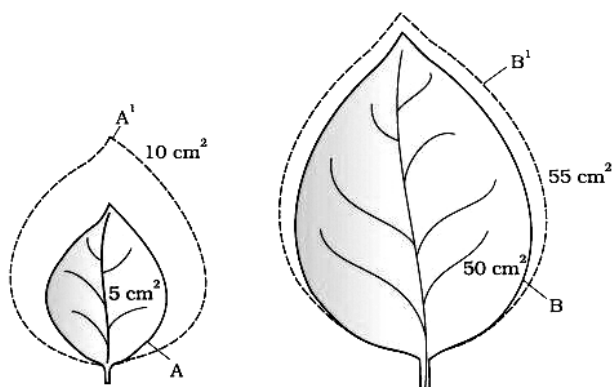
175. In 3 Domains system of classification, how many domains possess prokaryotic organisms?
- (1) Zero (2) Two
(3) One (4) Three
176. Match the terms in column-I with their meaning in column-II
- | Column-I | Column-II |
|-------------------|--|
| i. Phenotype | a. Expressed in homozygosity only |
| ii. Dominant | b. Removal of stamens |
| iii. Emasculation | c. Observable morphology |
| iv. Recessive | d. Expressed in heterozygous condition |
- (1) a-iii, b-iv, c-ii, d-i (2) a-iv, b-iii, c-i, d-ii
(3) a-i, b-ii, c-iii, d-iv (4) a-ii, b-iii, c-iv, d-i
177. Point the odd one out w.r.t. ovule
- (1) nucellus (2) embryo sac
(3) micropyle (4) pollen grain
178. Growth can not be taken as defining properties of living beings because it is
- (1) intrinsic in living organisms
(2) extrinsic in non living things
(3) also exhibited by mountains, boulders and sand mounds
(4) all of these
179. Which is incorrect with respect to air pollutants?
- (1) These cause injury to all living organisms
(2) These increase growth and yield of crops
(3) These cause premature death of plants
(4) These deleteriously affect the respiratory system of humans and of animals
180. If the cell of an organism heterozygous for two pairs of genes represented by AaBb, undergoes meiosis, then the possible genotypic combination of gametes will be
- (1) AB, aB, Ab, ab (2) AB, ab
(3) Aa, Bb (4) data insufficient
181. The phyllotaxy is same in which two plants ?
- (1) Guava & *Alstonia*
(2) Grass and mustard
(3) *Calotropis* & mustard
(4) Grasses & *Alstonia*
182. Organisms that can tolerate a wide range of salinity are
- (1) stenohaline (2) euryhaline
(3) stenothermal (4) eurythermal
183. The type of megaspore tetrad most commonly formed in angiosperms is
- (1) tetrahedral (2) linear
(3) T-shaped (4) decussate

184. Excess mineral ion concentration in tissues that reduces the dry weight of tissues by about 10% is considered as
- (1) deficiency
(2) toxic concentration
(3) optimum concentration
(4) beneficial concentration
185. Following are the reasons for greater species diversity in the tropics, except
- (1) availability of more solar energy
(2) relatively unpredictable climate
(3) more evolutionary time
(4) more constant and predictable environment

BOTANY : SECTION-B

This section has 15 questions, attempt any 10 questions of them.

186. Which of the following is incorrectly matched?
- (1) Cork cambium - phellogen
(2) Cork - phellem
(3) Secondary cortex - phelloderm
(4) Bark - vascular cambium
187. Which is correct w.r.t. photophosphorylation?
- a. It is the synthesis of ATP from ADP and inorganic phosphate in the presence of light
b. Two photosystems work in a series, first PS-I and then the PS-II
c. Two photosystems are connected through an electron transport chain
- (1) both a & c (2) a, b & c
(3) both a & b (4) both b & c
188. Which leaf shows higher relative growth rate and absolute growth rate respectively?



- (1) A; absolute growth rate is same in both A & B
(2) A; A
(3) B; A
(4) B; absolute growth rate is same in both A & B

189. **Statement-I** : Ozone hole develops each year over Antarctica between late August and early October.
Statement-II : CFCs release Cl which degrades O_3 releasing molecular O_2 during polar spring.
- Both statement-I and statement-II are correct
 - Both statement-I and statement-II are incorrect
 - Statement-I is correct but statement-II is incorrect
 - Statement-I is incorrect but statement-II is correct
190. Action spectrum of chlorophyll 'a' shows
- rate of photosynthesis at different wavelength of light
 - amount of light absorbed
 - amount of different wavelengths of light absorbed
 - both(1) and (2)
191. Genetic map is one that
- shows the stages during the cell division
 - shows the distribution of various species in a region
 - establishes location of the genes on a chromosome
 - establishes the various stages in gene evolution
192. Kaziranga National Park is protected area for
- Rhinoceros
 - Tigers
 - Birds
 - Lions
193. In the embryos of a typical dicot and grass plant, two homologous structures are
- coleoptile and plumule
 - coleoptile and coleorhiza
 - cotyledon and scutellum
 - hypocotyl and radicle
194. Which of the following is one way flow rather than in two directions or cyclic?
- Potassium
 - Nitrogen
 - Free energy
 - Carbon
195. Every year in winter Siberian cranes migrate from Russia to India for breeding. In the year 2006, a survey was done which has values in the given equation $N_{t+1} = N_t + [B + I] - (D + E)$ as follows
- Total number of cranes at the end of 2006 - 600
 - Number of cranes at the beginning of 2006 - 490
 - Number of cranes immigrated - 130
 - Number of cranes emigrated - 90
 - Number of cranes that took birth - 100
- Find out the mortality of the cranes in India during the surveyed period
- 60
 - 70
 - 100
 - 30
196. **Assertion** : Deoxyribonucleoside triphosphate serve dual purpose during replication
Reason : They act as substrate and provide energy for H-bonding among complementary base pairs.
- Both Assertion and Reason are true and the reason is the correct explanation of the assertion
 - Both Assertion and Reason are true but the reason is not the correct explanation of the assertion
 - Assertion is true statement but Reason is false
 - Assertion is false
197. In man brown eye is dominant over blue. A lady with brown eyes, whose father was blue eyed is married to a man with blue eyes. What percentage of her progeny will be blue eyed
- 0%
 - 25%
 - 100%
 - 50%
198. Pteridophytes differ from bryophytes in having
- Sporophyte dependent on gametophyte
 - Gametophyte dependent on sporophyte
 - Independent sporophyte
 - Absence of alternation of generations
199. The greatest contribution of root pressure may be to _____ the continuous chains of H_2O in the xylem
- break
 - re-establish
 - build pressure
 - can't say
200. In which year was the Air (prevention and control of pollution act) enacted and when was it amended to include noise as an air pollutant?
- 1984 and 1987
 - 1981 and 1987
 - 1974 and 1980
 - 1986 and 1989