



Sky Tutorials

fly beyond the sky...

IIT-JEE | NEET | Foundation

NEET

Time: 200 Minute

M.M. 720

ALL INDIA SKY TEST SERIES

Samarth Batch – Neet

Date : 15/10/2023

SYLLABUS

PHYSICS	CHEMISTRY	BOTANY	ZOOLOGY
Previous + Rotation	Previous + Equilibrium + Chemical Bonding	Previous + Plant Kingdom, Morphology of flowering plants (Upto Flower)	Previous + Morphology

Please read the instructions carefully. You are allotted 5 minutes specifically for this purpose.

INSTRUCTIONS:

- This Question paper is divided in to four parts physics, chemistry, botany, zoology and each part is further divided into two sections.
Section –A contains 35 Questions Section B contains 15 questions. Please ensure that the Questions paper you have received contains **ALL THE QUESTIONS** in each Part.
- In Section A all the 35 Questions are compulsory and in Section B Contain 15 Question, out of these 15 Questions,** candidates can choose to attempt any 10 Questions. Each Question has four choices (a), (b), (c), (d) out of which **only one is correct & Carry 4 marks each 1 mark** will be deducted for each wrong answer.

GENERAL INSTRUCTION

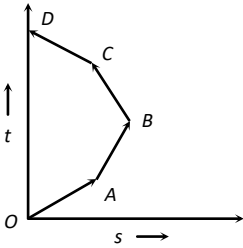
- Use only **blue/black pen (avoid gel pen)** for darkening the bubble.
- Indicate the correct answer for each question by filling appropriate bubble in your **OMR** answer sheet.
- The answer sheet will be checked through computer hence, the answer of the question must be marked by –shading the circles against the question by dark **blue/black pen**
- Blank papers, Clipboards, Log tables, Slide Rule, Calculator, Cellular Phones Papers and Electronic Gadgets in any form are **not** allowed to be carried inside the examination hall.


Name of the candidate: _____

Signature of the candidate: _____ Signature of the invigilator: _____

PHYSICS

SECTION – A

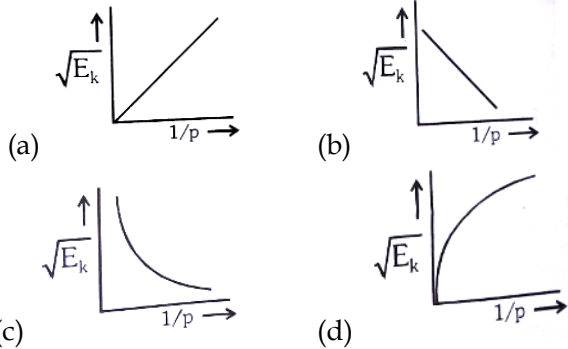
- Maximum value of static friction is called
(a) Limiting friction (b) Rolling friction
(c) Normal reaction (d) Coefficient of friction
- If a particle moves from point $P(2,3,5)$ to point $Q(3,4,5)$. Its displacement vector be
(a) $\hat{i} + \hat{j} + 10\hat{k}$ (b) $\hat{i} + \hat{j} + 5\hat{k}$
(c) $\hat{i} + \hat{j}$ (d) $2\hat{i} + 4\hat{j} + 6\hat{k}$
- If $A = 3\hat{i} + 4\hat{j}$ and $B = 7\hat{i} + 24\hat{j}$, the vector having the same magnitude as B and parallel to A is
(a) $5\hat{i} + 20\hat{j}$ (b) $15\hat{i} + 10\hat{j}$
(c) $20\hat{i} + 15\hat{j}$ (d) $15\hat{i} + 20\hat{j}$
- The expression $\left(\frac{1}{\sqrt{2}}\hat{i} + \frac{1}{\sqrt{2}}\hat{j}\right)$ is a
(a) Unit vector
(b) Null vector
(c) Vector of magnitude $\sqrt{2}$
(d) Scalar
- Given vector $\vec{A} = 2\hat{i} + 3\hat{j}$, the angle between \vec{A} and y -axis is
(a) $\tan^{-1} 3/2$ (b) $\tan^{-1} 2/3$
(c) $\sin^{-1} 2/3$ (d) $\cos^{-1} 2/3$
- There are two force vectors, one of 5 N and other of 12 N . At what angle the two vectors be added to get resultant vector of 17 N , 7 N and 13 N respectively
(a) $0^\circ, 180^\circ$ and 90° (b) $0^\circ, 90^\circ$ and 180°
(c) $0^\circ, 90^\circ$ and 90° (d) $180^\circ, 0^\circ$ and 90°
- Which of the following options is correct for the object having a straight line motion represented by the following graph


(a) The object moves with constantly increasing velocity from O to A and then it moves with constant velocity.
(b) Velocity of the object increases uniformly
(c) Average velocity is zero
(d) The graph shown is impossible
- A bullet fired into a fixed target loses half of its velocity after penetrating 3 cm . How much further it will penetrate before coming to rest assuming that it faces constant resistance to motion?
(a) 1.5 cm (b) 1.0 cm
(c) 3.0 cm (d) 2.0 cm
- The coordinates of a moving particle at any t time are given by $x = at^2$ and $y = bt^2$. The speed of the particle at any moment is
(a) $2t(a+b)$ (b) $2t\sqrt{(a^2 - b^2)}$
(c) $t\sqrt{a^2 + b^2}$ (d) $2t\sqrt{(a^2 + b^2)}$
- The displacement of a particle, moving in a straight line, is given by $s = 2t^2 + 2t + 4$ where s is in metres and t in seconds. The acceleration of the particle is
(a) 2 m/s^2 (b) 4 m/s^2 (c) 6 m/s^2 (d) 8 m/s^2
- A particle moves along x -axis in such a way that its coordinate X varies with time t according to the equation $x = (2 - 5t + 6t^2)\text{ m}$. The initial velocity of the particle is
(a) -5 m/s (b) 6 m/s
(c) -3 m/s (d) 3 m/s
- The angle of projection at which the horizontal range and maximum height of projectile are equal is
(a) 45°
(b) $\theta = \tan^{-1}(0.25)$
(c) $\theta = \tan^{-1} 4$
(d) 60°
- A ball is thrown upwards and it returns to ground describing a parabolic path. Which of the following remains constant
(a) Kinetic energy of the ball
(b) Speed of the ball
(c) Horizontal component of velocity
(d) Vertical component of velocity
- A force acts on a 2 kg object so that its position is given as a function of time as $x = 3t^2 + 5$. What is the work done by this force in first 5 seconds :
(a) 850 J (b) 900 J (c) 950 J (d) 875 J
- A block of mass m is kept on a platform which starts from rest with a constant acceleration $g/2$ upwards, as shown in the figure. Work done by normal reaction on block in time t is:


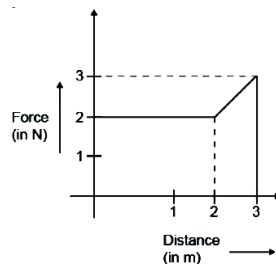
(a) zero (b) $\frac{3mg^2t^2}{8}$ (c) $-\frac{mg^2t^2}{8}$ (d) $\frac{mg^2t^2}{8}$

16. A particle which is experiencing a force, given by $\vec{F} = 3\hat{i} - 12\hat{j}$, undergoes a displacement of $\vec{d} = 4\hat{i}$. If the particle had a kinetic energy of 3J at the beginning of the displacement, what is its kinetic energy at the end of the displacement:
 (a) 15 J (b) 10 J (c) 12 J (d) 9 J

17. The graph between $\sqrt{E_k}$ and $\frac{1}{p}$ is
 (E_k = kinetic energy and p = momentum)

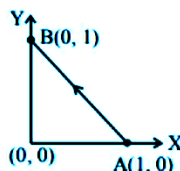


18. A particle moves in one dimension from rest under the influence of a force that varies with the distance travelled by the particle as shown in the figure. The kinetic energy of the particle after it has travelled 3m is :

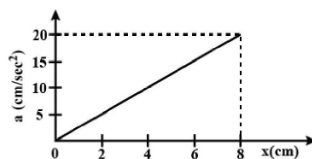


- (a) 6.5 J (b) 2.5 J (c) 4 J (d) 5 J
19. A force $F = 20 + 10y$ acts on a particle in y-direction where F is in newton and y in meter. Work done by the force to move the particle from $y = 0$ to $y = 1$ m is :
 (a) 30 J (b) 5 J (c) 25 J (d) 20 J

20. Consider a force vector $\vec{F} = -x\hat{i} + y\hat{j}$. The work done by this force in moving a particle from point A(1, 0) to B(0, 1) along the line segment is:



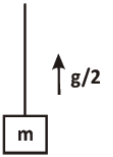
- (a) $3/2$ (b) 1 (c) 2 (d) $1/2$
21. A 10 kg mass moves along x-axis. Its acceleration as function of its position is shown in the figure. What is the total work done on the mass moves from $x = 0$ to $x = 8$ cm :



- (a) 8×10^{-2} joules (b) 16×10^{-2} joules
 (c) 4×10^{-4} joules (d) 1.6×10^{-3} joules

22. A person is moving eastward with a speed of 5 ms^{-1} and in 10 s, the speed changes to 5 ms^{-1} northwards. The average acceleration will be :
 (a) Zero
 (b) $\frac{1}{\sqrt{2}} \text{ ms}^{-2}$ towards N-W
 (c) $\frac{1}{2} \text{ ms}^{-2}$ towards N-W
 (d) $\frac{1}{2} \text{ ms}^{-2}$ towards N-E

23. A string is used to pull a block of mass m vertically up by a distance h at a constant acceleration $g/2$. The work done by tension in the string is :



- (a) $\frac{+3mgh}{2}$ (b) $\frac{-mgh}{4}$
 (c) $+\frac{5}{4}mgh$ (d) $+mgh$

24. If the momentum of a body increases by 20 %, the percentage increase in its K.E. is equal to :
 (a) 44 (b) 66 (c) 20 (d) 88
25. A car is negotiating a curved road of radius R . The road is banked at an angle θ . The coefficient of friction between the tyres of the car and the road is μ_s . The maximum safe velocity on this road is:

- (a) $\sqrt{gR^2 \left(\frac{\mu_s + \tan \theta}{1 - \mu_s \tan \theta} \right)}$ (b) $\sqrt{gR \left(\frac{\mu_s + \tan \theta}{1 - \mu_s \tan \theta} \right)}$
 (c) $\sqrt{\frac{g}{R} \left(\frac{\mu_s + \tan \theta}{1 - \mu_s \tan \theta} \right)}$ (d) $\sqrt{\frac{g}{R^2} \left(\frac{\mu_s + \tan \theta}{1 - \mu_s \tan \theta} \right)}$

26. A stone is tied to one end of a string and is rotated in a horizontal circle with a uniform angular velocity. Let T be the tension in the string. If the length of the string is halved and the angular velocity of the stone is doubled, the tension in the string will be
 (a) $2T$ (b) $4T$ (c) T (d) $8T$

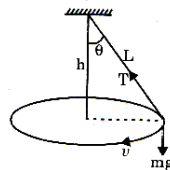
27. The magnitude of displacement vector of a particle which is moving in a circle of radius a with constant angular velocity ω as a function of time is

- (a) $2a \sin \omega t$ (b) $2a \sin \frac{\omega t}{2}$
 (c) $2a \cos \omega t$ (d) $2a \cos \frac{\omega t}{2}$

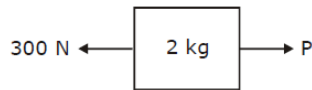
28. A particle is moving along a circular path with a constant speed. The acceleration of the particle is constant in
 (a) magnitude
 (b) direction
 (c) both magnitude and direction
 (d) neither magnitude nor direction
29. What will be the maximum speed of a car on a road turn of radius 30 m, if the coefficient of friction between the tyres and the road is 0.4?
 (a) 10.84 m/s (b) 9.84 m/s
 (c) 8.84 m/s (d) 6.84 m/s
30. A small coin is placed at a distance r from the centre of a gramophone record. The rotational speed of the record is gradually increased. If the coefficient of friction between the coin and the record is μ , the minimum angular frequency of the record, for which the coin will fly off, is given by
 (a) $\sqrt{\frac{2\mu g}{r}}$ (b) $\sqrt{\frac{\mu g}{2r}}$ (c) $\sqrt{\frac{\mu g}{r}}$ (d) $2\sqrt{\frac{\mu g}{r}}$
31. A ball is projected from the ground at an angle θ with the horizontal. After 1s, it moves horizontally. The velocity of projection will be :
 (a) $10\sqrt{3} \text{ ms}^{-1}$ (b) $20\sqrt{3} \text{ ms}^{-1}$
 (c) $10\sqrt{5} \text{ ms}^{-1}$ (d) $20\sqrt{2} \text{ ms}^{-1}$
32. A car is moving with speed 20 m/s on a circular path of radius 100 m. Its speed is increasing at the rate of 3 m/s^2 . The magnitude of acceleration of the car at that moment is.
 (a) 1 m/s^2 (b) 3 m/s^2 (c) 4 m/s^2 (d) 5 m/s^2
33. The kinetic energy K of a particle moving along a circle of radius R depends on the distance covered s as $K = a s^2$. The centripetal force acting on the particle is
 (a) $2asR$ (b) $2as^2$ (c) $2as$ (d) $\frac{2as^2}{R}$
34. A car round on unbanked curve of radius 92 m without skidding at a speed of 26 m/s. The smallest possible coefficient of static friction between the tyres and the road is
 (a) 0.75 (b) 0.60 (c) 0.45 (d) 0.30
35. A particle travels along the arc of a circle of radius r . Its speed depends on the distance travelled l as $v = a\sqrt{l}$ where a is constant. The angle α between the vectors of total acceleration and the velocity of the particle is.
 (a) $\alpha = \tan^{-1}\left(\frac{2l}{r}\right)$ (b) $\alpha = \cos^{-1}\left(\frac{2l}{r}\right)$

$$(c) \alpha = \sin^{-1}\left(\frac{2l}{r}\right) \quad (d) \alpha = \cot^{-1}\left(\frac{2l}{r}\right)$$

SECTION -B

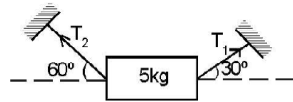
36. The speed of a particle moving in a circle of radius $r = 2 \text{ m}$ varies with time t is $v = t^2$, where t is in second and v in ms^{-1} . Value of radial, tangential and net acceleration at $t = 2 \text{ s}$ are A , B and C respectively then value of $\frac{2C^2}{AB}$ will be :
 (a) 80 (b) 10 (c) 5 (d) 160
37. The coefficient of friction between the tyres and the road is 0.25. The maximum speed with which a car can be driven round a curve of radius 40 m without skidding is (assume $g = 10 \text{ ms}^{-2}$):
 (a) 40 ms^{-1} (b) 20 ms^{-1}
 (c) 15 ms^{-1} (d) 10 ms^{-1}
38. If a cyclist moving with a speed of 4.9 m/s on a level road can take a sharp circular turn of radius 4m, then coefficient of friction between the cycle tyres and road is : ($g = 9.8 \text{ m/s}^2$)
 (a) 0.41 (b) 0.51 (c) 0.61 (d) 0.71
39. Find the maximum velocity for skidding for a car moved on a circular track of radius 100 m. The coefficient of friction between the road and tyre is 0.2.
 (a) 0.14 m/s (b) 140 m/s
 (c) 1.4 km/s (d) 14 m/s
40. A road is banked at an angle of 30° to the horizontal for negotiating a curve of radius $10\sqrt{3} \text{ m}$. At what velocity will a car experience no friction while negotiating the curve?
 (a) 54 km/hr (b) 72 km/hr
 (c) 36 km/hr (d) 18 km/hr
41. A 2kg stone attached to a string is whirled in a horizontal circle of radius 0.5 m. The string makes an angle of 30° with the vertical. The resultant force on the stone due to tension and weight is : ($g = 9.8 \text{ m/s}^2$)

 (a) 7.4 N (b) 11.3 N (c) 15.6 N (d) 20.2 N
42. A cyclist goes round a circular path of circumference 34.3 m in $\sqrt{22} \text{ sec}$. The angle made by him, with the vertical, will be :
 (a) 45° (b) 40° (c) 42° (d) 48°

43. The forces acting on an object of mass 2 kg are shown in the fig. If the body moves horizontally then find acceleration if force P is 400 N.



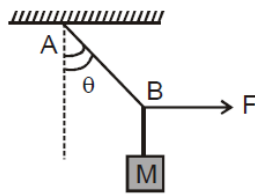
- (a) 50 m/s² (b) 10 m/s²
(c) 350 m/s² (d) 60 m/s²

44. A body of mass 5 kg is suspended by the strings making angles 60° and 30° with the horizontal -



- (A) T₁ = 25 N
(B) T₂ = 25 N
(C) T₁ = 25 √3 N
(D) T₂ = 25 √3 N
(a) A, B (b) A, D (c) C, D (d) B, C

45. A mass M is suspended by a rope from a rigid support at A as shown in figure. Another rope is tied at the end B, and it is pulled horizontally with a force F. If the rope AB makes an angle θ with the vertical in equilibrium, then the tension in the string AB is :



- (a) F sin θ (b) F / sin θ
(c) F cos θ (d) F / cos θ
46. A net force of 200 N gives a body of mass m₁ an acceleration of 80 ms⁻² and a body of mass m₂, an acceleration of 240 ms⁻². The acceleration that this force causes when the masses combine together is -

- (a) 50 ms⁻² (b) 60 ms⁻² (c) 120 ms⁻² (d) 100 ms⁻²
47. A car travelling at a speed of 30 kilometer per hour is brought to a halt in 8 metres by applying brakes. If the same car is travelling at 60 km per hour, it can be brought to halt with same braking power in-
- (a) 8 metres (b) 16 metres
(c) 24 metres (d) 32 metres

48. A spring toy weighting 1 kg on a spring balance suddenly jumps upward. A boy standing near the toy notices that the scale of the balance reads 1.05 kg. In this process the maximum acceleration of the toy is - (g = 10 m sec⁻²)
- (a) 0.05 m sec⁻² (b) 0.5 m sec⁻²
(c) 1.05 m sec⁻² (d) 1 m sec⁻²

49. A girl, of weight W, is sitting on an electric swing rotating in a vertical plane. She feels her weight to have increased by 25% as the swing goes up. What weight she would experience when the swing comes down?
- (a) 3/2 W (b) 5/4 W (c) 3/4 W (d) W/2

50. The acceleration with which an object of mass 100 kg be lowered from a roof using a cord with a breaking strength of 60 kg weight without breaking the rope is- (assume g = 10 m/sec²)
- (a) 2 m/sec² (b) 4 m/sec²
(c) 6 m/sec² (d) 10 m/sec²

CHEMISTRY SECTION – A

51. For the reaction H₂(g) + CO₂(g) ⇌ CO(g) + H₂O(g), If the initial concentration of [H₂] = [CO₂] and x mol/L of hydrogen is consumed at equilibrium, the correct expression of K_p is
- (a) $\frac{x^2}{(1-x)^2}$ (b) $\frac{x^2}{(2+x)^2}$
(c) $\frac{x^2}{1-x^3}$ (d) $\frac{(1+x)^2}{(1-x)^2}$
52. For which of the following reactions are the numerical value of K_p and K_c the same ?
- (a) H₂(g) + Cl₂(g) ⇌ 2HCl(g)
(b) 2SO₂(g) + O₂(g) ⇌ 2SO₃(g)
(c) 2NOCl(g) ⇌ 2NO(g) + Cl₂(g)
(d) N₂(g) + 3H₂(g) ⇌ 2NH₃(g)
53. In which of the following equilibrium, K_c and K_p and not equal ?
- (a) 2C(s) + O₂(g) ⇌ 2CO₂(g)
(b) 2NO(g) ⇌ N₂(g) + O₂(g)
(c) SO₂(g) + NO₂(g) ⇌ SO₃(g) + NO(g)
(d) H₂(g) + I₂(g) ⇌ 2HI(g)
54. The relation between K_p and K_c for the following reaction N₂(g) + 3H₂(g) ⇌ 2NH₃(g) is
- (a) K_p = K_c(RT) (b) K_c = K_p(RT)⁻²
(c) K_c = K_p(RT) (d) K_p = K_c(RT)⁻²
55. In which of the following reactions, the concentration of the product is higher than the concentration of reactant at equilibrium? (K=equilibrium constant)
- (a) A ⇌ B, K = 0.001 (b) M ⇌ N, K = 10
(c) X ⇌ Y, K = 0.005 (d) R ⇌ P, K = 0.01
56. In which of the following reactions, H₂O₂ acts as a reducing agent ?
- (a) HOCl + H₂O₂ $\xrightarrow{H^+}$ H₃O⁺ + Cl⁻ + O₂
(b) Mn²⁺ + H₂O₂ $\xrightarrow{OH^-}$ Mn⁴⁺ + 2OH⁻
(c) 2Fe²⁺ + H₂O₂ $\xrightarrow{OH^-}$ 2Fe³⁺ + 2OH⁻
(d) PbS(s) + 4H₂O₂(aq) $\xrightarrow{H^+}$ PbSO₄(s) + 4H₂O(l)

57. In one of the following reactions, HNO_3 does not behave as an oxidising agent, Identify it.
 (a) $\text{I}_2 + 10\text{HNO}_3 \rightarrow 2\text{HIO}_3 + 10\text{NO}_2 + 4\text{H}_2\text{O}$
 (b) $3\text{Cu} + 8\text{HNO}_3 \rightarrow 3\text{Cu}(\text{NO}_3)_2 + 2\text{NO} + 4\text{H}_2\text{O}$
 (c) $4\text{Zn} + 10\text{HNO}_3 \rightarrow 4\text{Zn}(\text{NO}_3)_2 + \text{NH}_4\text{NO}_3 + 3\text{H}_2\text{O}$
 (d) $2\text{HNO}_3 + \text{P}_2\text{O}_5 \rightarrow 2\text{HPO}_3 + \text{N}_2\text{O}_5$
58. The coefficients of I^- , IO_3^- and H^+ in the redox reaction, $\text{I}^- + \text{IO}_3^- + \text{H}^+ \rightarrow \text{I}_2 + \text{H}_2\text{O}$ in the balanced form respectively are
 (a) 5, 1, 6 (b) 1, 5, 6
 (c) 6, 1, 5 (d) 5, 6, 1
59. In the redox reaction, $x\text{KMnO}_4 + \text{NH}_3 \rightarrow y\text{KNO}_3 + \text{MnO}_2 + \text{KOH} + \text{H}_2\text{O}$ and y are
 (a) $x = 4, y = 6$ (b) $x = 3, y = 8$
 (c) $x = 8, y = 6$ (d) $x = 8, y = 3$
60. In alkaline medium, ClO_2 oxidises H_2O_2 to O_2 and reduced itself to Cl^- , then how many moles of H_2O_2 will be oxidise by one mole of ClO_2 ?
 (a) 1.0 (b) 1.5 (c) 2.5 (d) 3.5
61. $\text{Cu} + x\text{HNO}_3 \rightarrow \text{Cu}(\text{NO}_3)_2 + y\text{NO}_2 + z\text{H}_2\text{O}$, the above equation balances when,
 (a) $x = 2, y = 4, z = 3$ (b) $x = 4, y = 2, z = 2$
 (c) $x = 2, y = 4, z = 2$ (d) $x = 4, y = 4, z = 2$
62. The hydrogen bond is shortest in
 (a) $\text{S-H} \cdots \text{S}$ (b) $\text{N-H} \cdots \text{O}$
 (c) $\text{S-H} \cdots \text{O}$ (d) $\text{F-H} \cdots \text{F}$
63. Which of the following is the correct order of dipole moment?
 (a) $\text{NH}_3 < \text{BF}_3 < \text{NF}_3 < \text{H}_2\text{O}$
 (b) $\text{BF}_3 < \text{NF}_3 < \text{NH}_3 < \text{H}_2\text{O}$
 (c) $\text{BF}_3 < \text{NH}_3 < \text{NF}_3 < \text{H}_2\text{O}$
 (d) $\text{H}_2\text{O} < \text{NF}_3 < \text{NH}_3 < \text{BF}_3$
64. Which one of the following has the lowest dipole moment?
 (a) CH_3F (b) CH_3Cl (c) CH_3I (d) CH_3Br
65. CO is practically non-polar. Since,
 (a) the σ -electron drift from C to O almost nullified by the π -electron drift from O to C
 (b) the σ -electron drift from O to C is almost nullified by the π -electron drift from C to O
 (c) the bond moment is low
 (d) there is triple bond between C and O
66. The bond order of the N-O bonds in NO_3^- ion is
 (a) 0.33 (b) 1.00 (c) 1.33 (d) 1.50
67. Which of the following is polar?
 (a) I_3^- (b) CO_3^{2-} (c) XeF_4 (d) PF_3
68. Which of the following has octet around central atom?
 (a) PF_5 (b) SF_6 (c) CCl_4 (d) BF_3
69. Covalent compounds have low melting point because
 (a) covalent molecules are held by weak van der Waals' force of attraction
 (b) covalent bond is less exothermic
 (c) covalent bond is weaker than ionic bond
 (d) covalent molecules have definite shape
70. Which statement is not correct?
 (a) A sigma bond is weaker than a π -bond
 (b) A sigma bond is stronger than a π -bond
 (c) A double bond is stronger than a sigma bond
 (d) A double bond is shorter than a single bond
71. Benzoic acid contains
 (a) 15 σ and 2 π -bonds
 (b) 15 σ and 4 π -bonds
 (c) 14 σ and 4 π -bonds
 (d) 13 σ and 4 π -bonds
72. Most favourable conditions for ionic bonding are
 (a) high charge, small cation, large anion
 (b) low charge, large cation, small anion
 (c) low charge, large cation, large anion
 (d) high charge, small cation, small anion
73. Which one is most ionic?
 (a) P_2O_5 (b) MnO_2
 (c) Mn_2O_2 (d) P_2O_3
74. The correct order of the lattice energies of the following ionic compounds is
 (a) $\text{NaCl} > \text{MgBr}_2 > \text{CaO} > \text{Al}_2\text{O}_3$
 (b) $\text{NaCl} > \text{CaO} > \text{MgBr}_2 > \text{Al}_2\text{O}_3$
 (c) $\text{MgBr}_2 > \text{Al}_2\text{O}_3 > \text{CaO} > \text{NaCl}$
 (d) $\text{Al}_2\text{O}_3 > \text{CaO} > \text{MgBr}_2 > \text{NaCl}$
75. Which of the following is correct?
 (a) $\text{SO}_3^{2-} \Rightarrow$ Tetrahedral
 (b) $\text{NO}_2^- \Rightarrow$ Trigonal planar
 (c) $\text{ClO}_4^- \Rightarrow$ Tetrahedral
 (d) $\text{BrO}_4^- \Rightarrow$ square planar

76. **Assertion (A)** The central atom of NH_3 and H_2O , are both sp^3 -hybridised yet H-N-H bond angle is greater than that of H-O-H.
Reason (R) In NH_3 , N-atom has one lone pair of electron whereas in H_2O , oxygen atom has two lone pairs of electrons.
 (a) Both A and R are correct and R is the correct explanation of A
 (b) Both A and R are correct but R is not the correct explanation of A
 (c) A is correct but R is incorrect
 (d) Both A and R are incorrect
77. **Assertion (A)** in SF_6 , molecule, F-S-F bond angle is 90° .
Reason (R) SF_6 molecule has octahedral geometry with sp^3d^2 hybridization.
 (a) Both A and R are correct and R is the correct explanation of A
 (b) Both A and R are correct but R is not the correct explanation of A
 (c) A is correct but R is incorrect
 (d) Both A and R are incorrect
78. Oxidation number sulphur in $\text{H}_2\text{S}_2\text{O}_8$ is
 (a) +7 (b) +6 (c) +4 (d) +3
79. The AsF_5 molecule is trigonal bipyramidal. The hybrid orbitals used by the As-atoms for bonding are
 (a) $\text{d}_{x^2-y^2}, \text{d}_{z^2}, \text{p}_x, \text{p}_y$ (b) $\text{d}_{xy}, \text{s}, \text{p}_x, \text{p}_y, \text{p}_z$
 (c) $\text{s}, \text{p}_x, \text{p}_y, \text{p}_z, \text{d}_{z^2}$ (d) $\text{d}_{x^2-y^2}, \text{s}, \text{p}_x, \text{p}_y$
80. Match the following Columns.

	Column I		Column II
A.	ClF_3	1.	Square planar
B.	PCl_5	2.	Tetrahedral
C.	IF_5	3.	Trigonal bipyramidal
D.	CCl_4	4.	Square pyramidal
E.	XeF_4	5.	T-shaped

Codes

- | | A | B | C | D | E |
|-----|---|---|---|---|---|
| (a) | 5 | 4 | 3 | 2 | 1 |
| (b) | 5 | 3 | 4 | 2 | 1 |
| (c) | 5 | 3 | 4 | 1 | 2 |
| (d) | 4 | 3 | 5 | 2 | 1 |
81. Out of $\text{N}_2\text{O}, \text{SO}_2, \text{I}_3^+, \text{I}_3^-, \text{H}_2\text{O}, \text{NO}_2^-, \text{N}_3^-$ and NO_3^- , the linear species are
 (a) $\text{NO}_2^-, \text{I}_3^+, \text{H}_2\text{O}$ (b) $\text{N}_2\text{O}, \text{I}_3^+, \text{N}_3^-$
 (c) $\text{N}_2\text{O}, \text{I}_3^-, \text{N}_3^-$ (d) $\text{N}_3^-, \text{I}_3^+, \text{SO}_2$

82. **Assertion (A)** C-H bond in ethyne is shorter than C-H bonds in ethene.
Reason (R) Carbon atom in ethene is sp hybridised while it is sp^2 in ethyne.
 (a) Both A and R are correct and R is the correct explanation of A
 (b) Both A and R are correct but R is not the correct explanation of A
 (c) A is correct but R is incorrect
 (d) Both A and R incorrect
83. **Assertion (A)** SeCl_4 does not have a tetrahedral structure.
Reason (R) Se in SeCl_4 has two lone pairs.
 (a) Both A and R are correct and R is the correct explanation of A
 (b) Both A and R are correct but R is not the correct explanation of A
 (c) A is correct but R is incorrect
 (d) Both A and R are incorrect
84. Which one of the following statements in relation to the hydrogen atom is correct ?
 (a) 3s, 3p and 3d-orbitals all have the same energy
 (b) 3s and 3p-orbitals are of lower energy than 3d-orbital
 (c) 3p-orbital is lower in energy than 3d-orbital
 (d) 3s-orbital is lower in energy than 3p-orbital
85. If $n = 3, l = 0$ and $m = 0$ then atomic number is
 (a) 12 or 13 (b) 13 or 14
 (c) 10 or 11 (d) 11 or 12

SECTION-B

86. What is the oxidation number of vanadium in $\text{Rb}_4\text{Na}[\text{HV}_{10}\text{O}_{28}]$?
 (a) +8 (b) +5 (c) +3 (d) +1
87. The oxidation state of Fe in the brown ring complex $[\text{Fe}(\text{H}_2\text{O})_5\text{NO}]\text{SO}_4$ is
 (a) 0 (b) +2 (c) +1 (d) +3
88. When a manganous salt is fused with a mixture of KNO_3 and solid NaOH , the oxidation number of Mn changes from +2 to
 (a) +4 (b) +3 (c) +6 (d) +7
89. For the properties mentioned, the correct trend for the different species is in
 (a) strength as Lewis acid $-\text{BCl}_3 > \text{AlCl}_3 > \text{GaCl}_3$
 (b) inert pair effect $-\text{Al} > \text{Ga} > \text{In}$
 (c) oxidizing property $-\text{Al}^{3+} > \text{In}^{3+} > \text{Tl}^{3+}$
 (d) first ionization enthalpy $-\text{B} > \text{Al} > \text{Tl}$

90. Which one of the following is the correct order of the size of the ions ?
 (a) $\text{Na}^+ > \text{Mg}^{2+} > \text{F}^- > \text{O}^{2-}$
 (b) $\text{O}^{2-} > \text{F}^- > \text{Na}^+ > \text{Mg}^{2+}$
 (c) $\text{Mg}^{2+} > \text{Na}^+ > \text{F}^- > \text{O}^{2-}$
 (d) $\text{O}^{2-} > \text{F}^- > \text{Mg}^{2+} > \text{Na}^+$
91. Assertion (A) Removal of s-electron is relatively difficult than removal of p-electron of the same main shell.
 Reason (R) s-electrons are closer to the nucleus than p-electrons of the same shell and hence, are more strongly attracted by nucleus.
 (a) Both A and R are correct and R is the correct explanation of A
 (b) Both A and R are correct but R is not the correct explanation of A
 (c) A is correct but R is incorrect
 (d) Both A and R are incorrect
92. In periodic table, the basic character of oxides
 (a) increases from left to right and decreases from top to bottom
 (b) decreases from right to left and increase from top to bottom
 (c) decreases from left to right and increases from top to bottom
 (d) decreases from left to right and increases from bottom to top
93. Among 3rd row elements atomic size is maximum for
 (a) sodium (b) argon
 (c) magnesium (d) chlorine
94. Calculate the wavelength of light required to break the bond between two chlorine atoms in a chlorine molecule. The Cl-Cl bond energy is 243 kJ mol⁻¹.
 $(h = 6.6 \times 10^{-34} \text{ Js}, c = 3 \times 10^8 \text{ m/s},$
 Avogadro's number = $6.02 \times 10^{23} \text{ mol}^{-1}$)
 (a) $4.91 \times 10^{-7} \text{ m}$ (b) $4.11 \times 10^{-6} \text{ m}$
 (c) $8.81 \times 10^{-31} \text{ m}$ (d) $6.26 \times 10^{-21} \text{ m}$
95. If uncertainty in position and velocity are equal then uncertainty in momentum will be
 (a) $\frac{1}{2} \sqrt{\frac{mh}{\pi}}$ (b) $\frac{1}{2} \sqrt{\frac{h}{\pi m}}$
 (c) $\frac{h}{4\pi m}$ (d) $\frac{mh}{4\pi}$
96. Wave nature of electrons was demonstrated by
 (a) Schrodinger
 (b) de-Broglie
 (c) Davisson and Germer
 (d) Heisenberg
97. In a closed vessel, 5 moles of $\text{A}_2(\text{g})$ and 7 moles of $\text{B}_2(\text{g})$ are reacted in the following manner,
 $\text{A}_2(\text{g}) + 3\text{B}_2(\text{g}) \rightarrow 2\text{AB}_3(\text{g})$
 What is the total number of moles of gases present in the container at the end of the reaction ?
 (a) 22/3 (b) 7/3 (c) 14/3 (d) 8/3
98. The density of 2 M aqueous solution of NaOH is 1.28 g/cm³. The molality of the solution is [Given that molecular mass of NaOH = 40 g mol⁻¹]
 (a) 1.20 m (b) 1.56 m
 (c) 1.67 m (d) 1.32 m
99. Calculate the molarity of one litre solution of 22.2 g of CaCl_2
 (a) 0.4 M (b) 0.2 M (c) 0.8 M (d) 0.6 M
100. The weight of one molecule of a compound $\text{C}_{60}\text{H}_{122}$ is
 (a) 1.3×10^{-20} (b) $5.01 \times 10^{-21} \text{ g}$
 (c) $3.72 \times 10^{12} \text{ g}$ (d) $1.4 \times 10^{-21} \text{ g}$

BOTANY
SECTION – A

101. Root hairs are epidermal tubular outgrowth of which of the regions of the root?
 (a) Meristematic zone
 (b) Elongation zone
 (c) Maturation zone
 (d) Root cap zone
102. Which of the given function is generally **not** performed by roots?
 (a) Absorption of water
 (b) Absorption of minerals
 (c) Anchorage to the plant parts
 (d) Synthesis of food materials
103. Select the incorrect match.
 (a) Radish – Tap root modification
 (b) Sweet potato – Stem modification
 (c) Banyan tree – Prop root
 (d) Mangrove tree – Pneumatophores
104. *Nepenthes* species captures insect by
 (a) Bell shape flower
 (b) Modified leaves
 (c) Modified stem
 (d) Thorns

105. Choose the correct match.
 (a) Pineapple – Runner
 (b) Jasmine – Sucker
 (c) Water hyacinth – Offset
 (d) Grass – Stolon
106. Read the given statements and choose the correct option.
Statement-A: The apical buds in *Citrus* lose the ability to grow and form hard thread-like structures to protect the plants from browsing animals.
Statement-B: The veinlets form a network in reticulate venation as in dicot such as Gram.
 (a) Only statement A is correct
 (b) Only statement B is correct
 (c) Both statements A and B are correct
 (d) Both statements A and B are incorrect
107. How many leaves are expected on a branch having 3 nodes in *Calotropis*?
 (a) 15 (b) 12 (c) 6 (d) 3
108. The phyllodes perform the function of
 (a) Reproduction
 (b) Protection from browsing animals
 (c) Fleshy leaves to store food
 (d) Green leaves for photosynthesis
109. In an inflorescence the main axis terminates into a flower is called
 (a) Pedicel (b) Peduncle
 (c) Petiole (d) Phyllode
110. Among the list of examples Mustard, Plum, Rose, Peach, Brinjal, Chinarose, Guava, Cucumber
 How many plants have hypogynous flower?
 (a) 5 (b) 8 (c) 3 (d) 4
111. Match the columns and select the correct option.
- | Column-I | | Column-II | |
|----------|-------------------------|-----------|---|
| (A) | Polyandrous condition | (i) | Sepals united |
| (B) | Polyadelphous condition | (ii) | Stamens are united into more than two bundles |
| (C) | Epiphyllous stamen | (iii) | Free stamens |
| (D) | Gamosepalous condition | (iv) | Stamen is attached to perianth |
- (a) A(i), B(ii), C(iii), D(iv)
 (b) A(iv), B(iii), C(ii), D(i)
 (c) A(ii), B(i), C(iv), D(iii)
 (d) A(iii), B(ii), C(iv), D(i)
112. The placenta develops at the base of the ovary in
 (a) *Primrose* (b) Marigold
 (c) *Argemone* (d) *Pisum sativum*
113. Arrange the following zones of root from its apex part and select the correct option
 A. Root cap zone
 B. Meristematic zone
 C. Elongation zone
 D. Maturation zone
 (a) A, C, B, D (b) B, C, D, A
 (c) A, B, C, D (d) D, C, B, A
114. Choose the wrong statement.
 (a) Carrot, turnip and sweet potato are the examples of modified adventitious root
 (b) Stilt roots arise from lower nodes of the stem
 (c) *Rhizophora* is growing in swampy areas
 (d) Prop roots are the aerial roots.
115. The modified underground stems are meant for all of the given, except
 (a) Organs of perennation
 (b) Storing food materials
 (c) Vegetative reproduction
 (d) Photosynthesis
116. Among the list of some plants Grapevine, Pumpkins, Cucumber, *Bougainvillea*, Citrus, Pea, Cactus
 How many of them show stem tendrils?
 (a) Three (b) Five
 (c) Six (d) Two
117. Which component of the embryo, present in the germinating seed give rise to the stem?
 (a) Radicle (b) Plumule
 (c) Endosperm (d) Aleurone layer
118. Select the correct match:
 (a) Bisexual flower – Maize
 (b) Actinomorphic flower – Pea
 (c) Zygomorphic flower – *Datura*
 (d) Asymmetric flower – *Canna*
119. Which of the following is correctly matched?
 (a) Formation of false septum – Axile placentation
 (b) Presence of true septum – Marginal placentation
 (c) Absence of septum – Free central placentation
 (d) Presence of ventral suture – Parietal placentation

120. Select the pair of plants where gynoecium is situated in center and other parts of flowers are located on the rim of the thalamus, almost at the same level as the ovary
 (a) Plum and Peach
 (b) Guava and Cucumber
 (c) Ray floret and disc floret of sunflower
 (d) Brinjal and Tomato
121. The classification system based on vegetative structures or androecium structure was given by
 (a) Linnaeus
 (b) Engler and Prantl
 (c) George Bentham
 (d) Joseph Dalton Hooker
122. **Statement A:** The number and codes are assigned to all the observable characters and the data is then processed.
Statement B: All characters are compared by computers by giving equal importance.
 Above given statements are true for
 (a) Cytotaxonomy
 (b) Numerical taxonomy
 (c) Chemotaxonomy
 (d) Karyotaxonomy
123. This plant can live in soil but is dependent on water for sexual reproduction. It is
 (a) *Fucus* (b) *Wolffia*
 (c) *Cedrus* (d) *Sphagnum*
124. Match the following columns and select the correct option
- | Column-I | | Column-II | |
|----------|--------------------|-----------|--|
| (A) | <i>Cycas</i> | (i) | Lycopsida |
| (B) | <i>Selaginella</i> | (ii) | Gymnosperm with branched stem |
| (C) | <i>Pinus</i> | (iii) | Diplontic life cycle |
| (D) | <i>Eucalyptus</i> | (iv) | N ₂ fixing cyanobacteria in roots |
- (a) A(iv), B(i), C(ii), D(iii)
 (b) A(iii), B(ii), C(i), D(iv)
 (c) A(iv), B(ii), C(i), D(iii)
 (d) A(iv), B(i), C(iii), D(ii)
125. Compact strobili or cones are characteristic feature of all of the following plants except
 (a) *Pinus* (b) *Selaginella*
 (c) *Equisetum* (d) Female *Cycas* plant
126. The homosporous vascular cryptogams
 (a) Show the events precursor to the seed habit
 (b) Produce same types of spores
 (c) Are aquatic ferns only
 (d) Show haplointic life-cycle pattern
127. Coralloid roots of *Cycas* are associated with
 (a) Nitrogen fixing cyanobacteria
 (b) Water absorbing basidiomycetes
 (c) Chemosynthetic heterotrophic bacteria
 (d) Chemoautotrophic archaeobacterial
128. Identify the mismatched pair.
 (a) *Volvox* – Non-motile female gamete
 (b) *Chlamydomonas* – Unicellular alga
 (c) *Fucus* – Floridean starch
 (d) *Sargassum* – Biflagellate zoospores
129. How many feature(s) is/are common between bryophytes and pteridophytes?
 A. True leaves
 B. Diploid sporophyte
 C. Jacketed sex organs
 D. Motile male gametes
 E. Haplo - diplointic life-cycle
 (a) Three (b) Four (c) Two (d) One
130. How many among the following are members of Rhodophyceae and Phaeophyceae respectively?
Dictyota, Gelidium, Polysiphonia, Gracilaria, Sargassum, Ectocarpus, Porphyra
 (a) 5, 2 (b) 3, 4 (c) 4, 2 (d) 4, 3
131. Identify the statements as True (T) or False (F) w.r.t. *Ulothrix*.
 A. It shows haplo-diplointic life cycle pattern.
 B. Has rigid cell wall made up of an inner layer of cellulose and an outer layer of carrageen.
 C. Most common spores produced are the zoospores.
 D. Dominant pigments are chlorophyll-a and chlorophyll-b.
 (a) A - T, B - F, C - T, D - T
 (b) A - F, B - F, C - T, D - T
 (c) A - F, B - T, C - F, D - F
 (d) A - F, B - T, C - T, D - F
132. On the basis of the following features, identify the algae from the given options.
 • Inner cellulosic cell wall is covered outside by algin
 • Pear-shaped gametes bear two laterally attached flagella.
 (a) *Chara* (b) *Prophyra*
 (c) *Spirogyra* (d) *Laminaria*
133. In liverworts, gemmae are
 (a) Non-green, multicellular vegetative structures
 (b) Green, unicellular asexual buds
 (c) Non-green, unicellular vegetative buds
 (d) Green, multicellular asexual buds

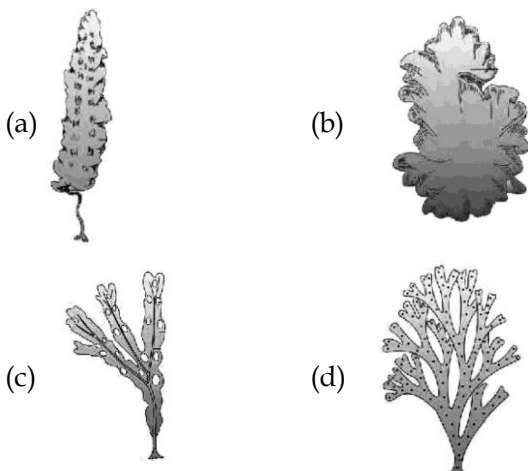
134. Consider the following statements w.r.t. mosses and select the right choice.
- The sporophyte is less elaborate than that of liverworts
 - Zygote develops into green filamentous structure
 - Sex organs are produced at the apex of the leafy shoots.
 - Leafy stage is developed from secondary protonema.
- (a) A, B & C are correct (b) Only A is incorrect
(c) C and D are correct (d) Only D is correct

135. Which of the following features is not correct for pteridophytes?
- Main plant body is differentiated into stem, leaves and roots
 - Vascular tissue has xylem and phloem
 - These plants may be homosporous or heterosporous
 - They always retain megaspores permanently within the megasporangia

SECTION – B

136. Majority of the red algae are marine and reach the maximum depth in sea water where no other type of photosynthetic organism grow. Red colour of these algae is due to the abundance of
- Chlorophyll a
 - Chlorophyll b
 - Fucoxanthin
 - Phycoerythrin

137. Which of the following alga has stored food very similar to amylopectin and glycogen in structure?



138. *Selaginella*, *Dryopteris*, *Equisetum*, *Adiantum*, *Lycopodium* and *Pteris* belong to how many classes of pteridophytes?
- One
 - Two
 - Three
 - Four

139. Pyrenoids in green algae contain
- Protein and starch
 - Cellulose and fatty acids
 - Cellulose and starch
 - Glucose and glycogen

140. The number of cells in the egg apparatus of embryo sac in angiosperms is
- Two
 - Five
 - Three
 - Four

141. Choose the incorrect statement regarding eukaryotic cells.
- Presence of extensive compartmentalization of cytoplasm
 - Presence of an organized nucleus having a nuclear envelope
 - Cytoskeletal structures are absent
 - Genetic material is organized into circular DNA
- (A) and (B) only
 - (B) and (C) only
 - (C) and (D) only
 - All (A), (B), (C) and (D)

142. Choose the incorrect statement w.r.to eukaryotic flagella.
- Hair like outgrowth of cell membrane
 - Elongated structure and responsible for cell movement
 - It is structurally same as prokaryotic flagella
 - Possess a number of microtubules running parallel to the long axis

143. The lowest category that is shared by both potato and wheat is
- Class
 - Family
 - Division
 - Order

144. Select the incorrect statement w.r.t. binomial nomenclature
- The scientific name is printed in italics
 - Both words of a scientific name are underlined separately when handwritten
 - Each organism has one name consisting of two words
 - Binomial epithet has generic and specific names only

145. Read the following statements and choose the correct option.

Statement A: Crossing over is completed in anaphase – I.

Statement B: Interkinesis and interphase are similar to each other in terms of replication of DNA.

- Only statement A is correct
- Only statement B is correct
- Both statements A and B are correct
- Both statements A and B are incorrect

146. Select the correct option w.r.t. the daughter cells produced after meiosis I
- Are genetically similar to each other
 - Are genetically similar to parent cell
 - Are genetically dissimilar to each other
 - Have same ploidy level as that of parent cell
147. As living organisms work continuously, the living state is a
- Equilibrium non-steady state
 - Equilibrium steady state
 - Non-equilibrium steady state
 - Non-equilibrium non-steady state
148. **Statement A:** Dissolving of CO₂ in water which is a physical process is a catalysed reaction in the living system.
Statement B: There is no uncatalysed metabolic conversion in the living system.
- Statement A is true but B is false
 - Statement B is true but A is false
 - Both statements are true
 - Both statements are false
149. Select the odd match w.r.t. kingdom Monera
- Photosynthetic autotrophs: Blue green algae
 - Chemosynthetic autotrophs: Recycling of nutrients
 - Comma shaped bacterium: *Vibrio*
 - Heterotrophic bacteria: Use inorganic substance to produce ATP
150. Match the columns and select the correct option

Column-I		Column-II	
(A)	Sporozoans	(i)	Planktons
(B)	Euglenoids	(ii)	Marshy areas
(C)	Methanogens	(iii)	<i>Plasmodium</i>
(D)	Diatoms	(iv)	Pellicle

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

ZOOLOGY

SECTION - A

Section - A

151. Which of the following comprises the lungs?
- Tracheae, (B) 1° bronchi, (C) 2° bronchi, (D) 3° bronchi, (E) initial bronchioles, (F) terminal bronchioles, (G) duct of alveoli, (H) alveoli
- B, C, D, E, F, G and H
 - A, B, C, D, E, F and G
 - A, B, C, D, E and F
 - A, B, C, D and E
152. Trachea is a straight tube extending up to the mid-thoracic cavity, which divides at the level of
- Last thoracic vertebra into right and left 1° bronchi
 - Third lumbar vertebra into right and left 1° bronchiole
 - Fifth thoracic vertebra into right and left 1° bronchiole
 - Fifth thoracic vertebra into right and left 1° bronchi
153. What are the function of the conducting part the respiratory system?
- Transporation of the atmospheric air to the alveoli
 - Clears atmospheric air from foreign particles
 - Humidifies atmospheric air
 - Brings the atmospheric air to body temperature
 - Diffusion of O₂ and CO₂ between blood and atmospheric air
- A, B and C
 - A, B, C and D
 - A, B, C and E
 - A, B, C and E
154. Normal breathing rate of a healthy human is
- 70-75 times/minute
 - 15-20 times/minute
 - 12-16 times/minute
 - 10-12 times-minute
155. The lungs are situated in a thoracic chamber which is formed dorsally by the ...A..., ventrally by the ...B..., laterally by the ...C... and on lower side by the ...D...
- B-sternum, C-diaphragm, A-vertebral column, D-ribs
 - A-sternum, C-diaphragm, B-vertebral column, D-ribs
 - B-sternum, D-diaphragm, A-vertebral column, C-ribs
 - D-sternum, C-diaphragm, A-vertebral column, B-ribs

156. Match the columns.

(1)	Tidal volume	(A)	2500-3000 ml of air
(2)	Inspiratory reserve Volume	(B)	1000-1100 ml of air
(3)	Expiratory reserve volume	(C)	500 ml of air
(4)	Residual volume	(D)	3400-4800 ml of air
(5)	Vital capacity	(E)	1100-1200 ml of air

- (a) 1 - C, 2 - D, 3 - B, 4 - A, 5 - E
 (b) 1 - C, 2 - A, 3 - B, 4 - E, 5 - D
 (c) 1 - C, 2 - A, 3 - D, 4 - E, 5 - B
 (d) 1 - E, 2 - A, 3 - B, 4 - E, 5 - D

157. About 97% of oxygen is transported by RBC. The remaining 3% is
 (a) Retained in lungs
 (b) Dissolved in plasma and transported
 (c) Attached to cell membrane
 (d) Inside mitochondria

158. Match the columns I and II, and choose the correct combination from the options given.

Column I (Formed elements)		Column II (Number)	
(A)	Erythrocytes	1.	5-5.5 millions mm^{-3}
(B)	Leucocytes	2.	6000-8000 mm^{-3}
(C)	Platelets	3.	1,50,000-3,50,000 mm^{-3}

- (a) A - 1, B - 2, C - 3 (b) A - 2, B - 1, C - 3
 (c) A - 3, B - 2, C - 1 (d) A - 1, B - 3, C - 2

159. Fill in the blanks :

Blood groups	Antigens on RBCs	Antibodies in plasma
A	A	...1...
B	B	...2...
AB	...3...	...4...
O	...5...	anti-A,B

- (a) 1 - anti - A, 2 - anti - B, 3 - nil, 4 - anti - B, 5 - A, B
 (b) 1 - anti - A, 2 - anti - B, 3 - A B, 4 - nil, 5 - nil
 (c) 1 - anti - B, 2 - anti - A, 3 - A, B, 4 - nil, 5 - nil
 (d) 1 - anti - B, 2 - anti - A, 3 - nil, 4 - anti - B, 5 - A, B

160. Erythroblastosis foetalis can be avoided by administering...A... to the ...B... immediately after the delivery of the ...C... child.
 (a) A-Rh antibodies, B-child, C-first
 (b) A-Rh antibodies, B-mother, C-second
 (c) A-anti-Rh antibodies, B-mother, C-second
 (d) A-anti-Rh antibodies, B-mother, C-first

161. Lymph consists of

- (a) RBCs, WBCs and plasma
 (b) RBCs, proteins and platelets
 (c) All components of blood except RBCs and some larger plasma proteins
 (d) WBCs and serum

162. The opening of the right and the left ventricles into the pulmonary artery and the aorta respectively are provided with the
 (a) Bicuspid valves (b) Tricuspid valves
 (c) Semilunar valves (d) Both A and B

163. Sino-atrial node (SAN) is a patch of nodal tissue is present in
 (a) Right upper corner of right atrium
 (b) Left upper corner of right atrium
 (c) Right lower corner of left atrium
 (d) Left lower corner of left atrium

164. Match the columns I and II, and choose the correct combination from the options given.




Column I		Column II	
A.	Superior Vena Cava	p.	Carries deoxygenated blood to lungs
B.	Inferior Vena Cava	q	Carries oxygenated blood from lungs
C.	Pulmonary Artery	r.	Brings deoxygenated blood from lower parts of body to right atrium
D.	Pulmonary Vein	t.	Brings deoxygenated blood from upper parts of body into right atrium

- (a) A - q, B - t, C - r, D - p
 (b) A - t, B - p, C - q, D - r
 (c) A - t, B - r, C - p, D - q
 (d) A - t, B - p, C - r, D - q

165. Read the following statements and find out the incorrect statement.

- (a) Though the heart is autoexcitable, its functions can be moderated by neural and hormonal mechanism.
 (b) Angina pectoris can occur in men and women of any age but it is more common among the middle aged and elderly.
 (c) Heart failure is same as cardiac arrest or heart attack.
 (d) CAD is caused by deposits of calcium, fat, cholesterol and fibrous tissues, which makes the lumen of arteries narrower.

166. Match the column I, II and III and choose the correct combination from the options given.

	Column - I		Column - II		Column - III
A.		1.	Hirudinaria	K.	Monoecious
B.		2.	Pheretima	L.	Dioecious
C.		3.	Nereis		

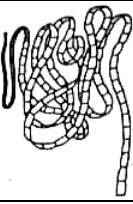

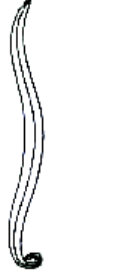
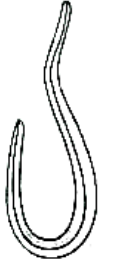
- (a) A - 1 - K, B - 3 - K, C - 2 - L
 (b) A - 1 - L, B - 3 - L, C - 2 - K
 (c) A - 2 - L, B - 1 - K, C - 3 - K
 (d) A - 1 - K, B - 3 - L, C - 2 - K

167. Fill in the blanks.

Sponges reproduceA....by fragmentation andB..... by formation of gametes

- (a) A - sexually, B - asexually
 (b) A - asexually, B - sexually
 (c) A - vegetatively, B - asexually
 (d) A - asexually, B - Vegetatively

168. Match the column I, II and III and choose the correct combination from the options given

	Column - I (Figure)		Column - II (Name)		Column - III (Organization)
A.		1.	Male Ascaris	Q.	Cellular
B.		2.	Female Ascaris	R.	Tissue level
C.		3.	Taenia	S.	Organ level
D.		4.	Pleurobrachia	T.	Organ system level

- (a) A - 3 - S, B - 4 - R, C - 1 - T, D - 2 - T
 (b) A - 3 - S, B - 4 - R, C - 2 - T, D - 1 - T
 (c) A - 3 - R, B - 4 - S, C - 2 - T, D - 1 - T
 (d) A - 4 - Q, B - 3 - T, C - 1 - S, D - 2 - R

169. Read the following statements carefully

- A. They are triploblastic
 B. Alimentary canal is complete with a well-developed muscular pharynx
 C. An excretory tube remove body wastes from the body cavity through excretory pore
 D. They are dioecious
 E. Fertilization is internal





Above features belong to which phylum?

- (a) Annelida (b) Arthropoda
 (c) Aschelminthes (d) Mollusca

170. In sponges, spongocoel is lined by.

- (a) Choanocytes (b) Amoebocytes
 (c) Pinacocytes (d) Archaeocytes

171. Match the column I, II and III and choose the correct combination from the options given.

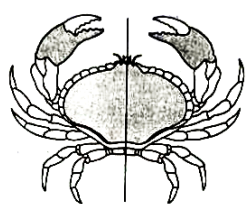
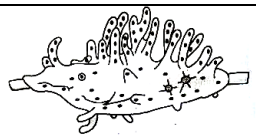

	Column - I		Column - II		Column - III
A.		1.	Locusta	W.	Analogy with bird
B.		2.	Butterfly	X.	Green gland
C.		3.	Prawn	Y.	Sting for paralyzing prey
D.		4.	Scorpion	Z.	Gregarious pest

- (a) A - 1 - Y, B - 4 - X, C - 3 - W, D - 2 - Z
 (b) A - 3 - Y, B - 2 - X, C - 1 - Z, D - 2 - W
 (c) A - 3 - X, B - 4 - Y, C - 1 - Z, D - 2 - W
 (d) A - 1 - Z, B - 4 - Y, C - 3 - X, D - 2 - W

172. For life cycle of *Obelia*, most approximate term used is

- (a) Metamerism
 (b) Metagenesis
 (c) Alternation of generation
 (d) both (b) and (c)

173. Match the column I and II, and choose the correct combination from the options given.

	Column - I		Column - II
A.	Any plane passing through central axis of body divides the organisms into two identical halves	1.	
B.	Body can be divided into identical left and right halves in only one plane	2.	
C.	Any plane that passes through the centre does not divide them into equal halves.	3.	

- (a) A - I, B - II, C - III (b) A - III, B - II, C - I
 (c) A - III, B - I, C - II (d) A - II, B - III, C - I

174. When body cavity is not lined by mesoderm, instead, the mesoderm is present as scattered pouches in between the ectoderm and endoderm. Such a body cavity is called.

- (a) Coelom (b) True coelom
 (c) Pseudocoelom (d) Acoelom

175. In which of the following, polyp phase does not found?

- (a) *Hydra* (b) *Obelia* (c) *Physalia* (d) *Aurelia*

176. Match the column I and II and choose the correct combination from the option given

	Column - I		Column - II
A.	<i>Gorgonia</i>	I.	Brain coral
B.	<i>Adamsia</i>	II.	Jelly fish
C.	<i>Meandrina</i>	III.	Portuguese - man - of war
D.	<i>Physalia</i>	IV.	Sea anemone
E.	<i>Pennatula</i>	V.	Sea - fan
F.	<i>Aurelia</i>	VI.	Sea - pen

- (a) A - VI, B - IV, C - III, D - I, E - V, F - II
 (b) A - V, B - IV, C - I, D - III, E - VI, F - II
 (c) A - V, B - III, C - I, D - IV, E - II, F - VI
 (d) A - V, B - IV, C - III, D - I, E - VI, F - II

177. Correct flow of water current in sponges is

- (a) Ostia - Osculum - Spongocoel - Outside
 (b) Osculum - Spongocoel - Ostia - Outside
 (c) Ostia - Spongocoel - Osculum - Outside
 (d) Osculum - Ostia - Spongocoel - Outside

178. Diploblastic, radially symmetrical, marine animal showing bioluminescent property is/are

- (a) Comb jelly (b) Jelly fish
 (c) Sea walnut (d) Both (a) and (c)

179. Read the following statement carefully.

- A. Hooks and suckers are present in parasitic forms
 B. Some of them absorb nutrients from the host directly through their body surface
 C. Fertilization is internal and development is through many larval stages



Here we are talking about

- (a) Platyhelminthes (b) Aschelminthes
 (c) Annelids (d) Mollusca

180. Bioluminescent property is well marked in

- (a) Coelentrates (b) Ctenophores
 (c) Platyhelminthes (d) Branchiostoma

181. Match the column I, II and III and choose the correct combination from the options given

	Column - I		Column - II		Column - III
A.		I.	<i>Aurelia</i>	R	Polyp
B.		II.	<i>Adamsia</i>	S.	Medusa

- (a) A - I - R, B - II - S (b) A - I - S, B - II - R
(c) A - II - R, B - I - S (d) A - II - S, B - I - R

182. Corals are the member of

- (a) Platyhelminthes (b) Porifera
(c) Coelentrata (d) Chordata

183. Match the column I, II and III and choose the correct combination from the options given

	Column - I		Column - II		Column - III
A.	<i>Wuchereria</i>	I.	Liver fluke	Q.	Monoecious
B.	<i>Hirudinaria</i>	II.	Filaria worm	R.	Metamerism
C.	<i>Ancylostoma</i>	III.	Blood sucking leech	S.	Endoparasite
D.	<i>Fasciola</i>	IV.	Hookworm	T.	Dioecious

- (a) A - IV - T, B - III - R, C - II - S, D - I - Q
(b) A - II - S, B - III - Q, C - IV - T, D - I - S
(c) A - II - T, B - III - R, C - IV - S, D - I - R
(d) A - II - Q, B - III - T, C - IV - R, D - I - S

184. Animals having dorso - ventrally flattened body are

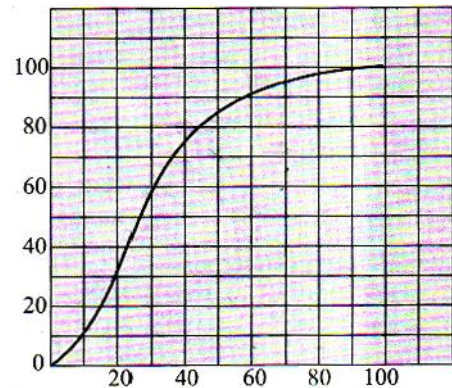
- (a) Coelentrates (b) Ctenophores
(c) Platyhelminthes (d) Aschelminthes

185. Which of the following is not correctly matched?

- (a) Gregarious pest - *Locusta* (locust)
(b) Living fossil - *Limulus* (king crab)
(c) Economically important insects - *Apis* (honey bee), *Bombyx* (silkworm)
(d) Vectors - Mosquitoes (*Anopheles*, *Culex* and *Aedes*) and Lac insect (*Laccifer*)

Section - B

186. In oxygen dissociation curve x-axis and y-axis represents



- (a) x-axis - partial pressure of oxygen
y-axis - percentage saturation of Hb with oxygen
(b) x-axis - partial pressure of oxygen
y-axis - partial pressure of oxygen
(c) x-axis - partial pressure of CO₂
y-axis - percentage saturation of oxyhaemoglobin with oxygen
(d) x-axis - partial pressure of CO₂
y-axis - partial pressure of oxygen

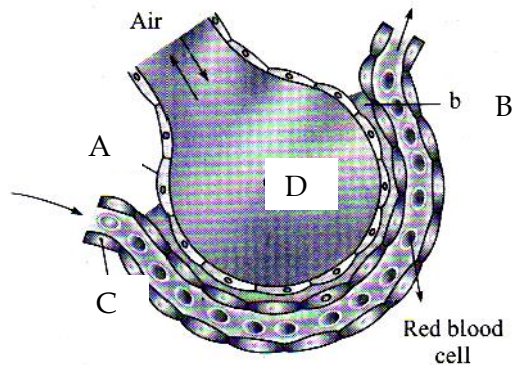
Paragraph for Question

Directions : If the following questions, a statement of Assertion followed by a statement of Reason is given. Choose the correct answer out of the following choices.

- (A) If both assertion and reason are true and the reason is the correct explanation of the assertion.
(B) If both assertion and reason are true, but reason is not the correct explanation of the assertion.
(C) If assertion is true, but reason is false.
(D) If both assertion and reason are false.
187. **Assertion :** Every 100 ml of oxygenated blood can deliver around 4 ml of O₂ to tissues under normal physiological conditions.
Reason : Every 100 ml of deoxygenated blood delivers approximately 5 ml of CO₂ to the alveoli.
(a) (b) (c) (d)
188. **Assertion:** SAN is also called pacemaker.
Reason : SAN present in right upper corner of atrium can generate maximum number of action potentials
(a) (b) (c) (d)

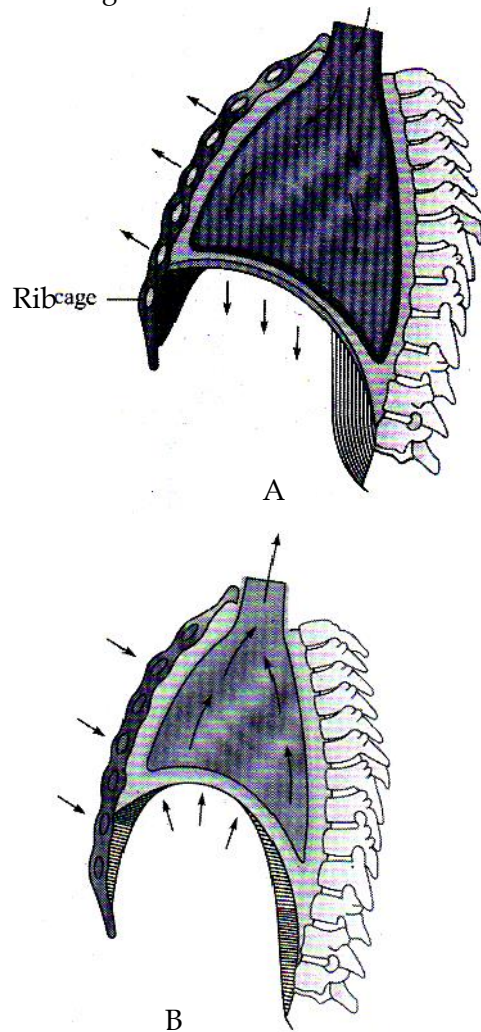
189. What is correct about human respiration?
- About 90% of CO_2 is carried by haemoglobin as carbaminohaemoglobin.
 - Neural signals from pneumotoxic centre of pons can increase duration of inspiration.
 - Workers in grinding and stone breaking industries may suffer from lung fibrosis.
 - Cigarette smoking leads to inflammation of bronchi
190. What is correct about ECG?
- P-depolarisation of atria
 - R - repolarisation of ventricles
 - T-start of systole
 - T-end of diastole
191. Choose the correct option.
- Human heart is ectodermal in origin.
 - Mitral valve guards the opening between right atrium and left ventricle.
 - SAN is located on the left upper corner of right atrium.
 - Stroke volume \times Heart rate = Cardiac output
- (i) alone is correct
 - (i) and (ii) alone are correct
 - (ii) and (iii) alone are correct
 - (iv) alone is correct

192. Recognise the figure and find out the correct matching.



- A-endothelium, B-basement membrane, C-alveolar wall, D-pulmonary cavity
- A-mesothelium, B-basement substance, C-alveolar wall, D-alveolar cavity
- A-alveolar wall, B-basement membrane, C-blood capillary, D-alveolar cavity
- A-alveolar wall, B-basement substance, C-blood capillary, D-alveolar cavity

193. Recognise the figure and find out the correct matching.



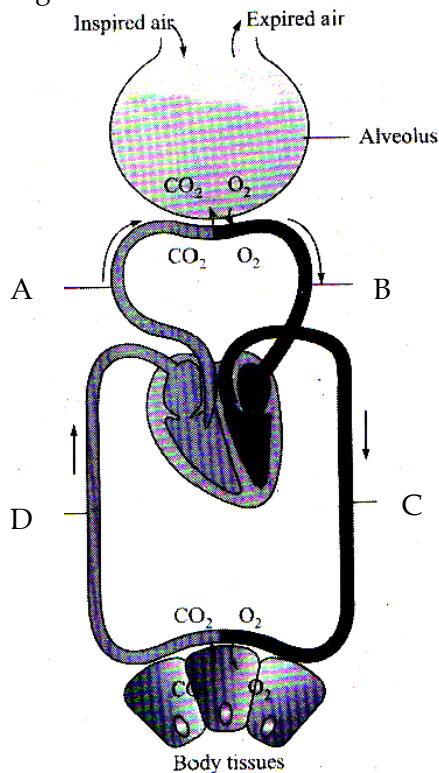
- A-inspiration, B-expiration
- A-expiration, B-inspiration
- A-breathing, B-diffusion
- A-diffusion, B-breathing

194. Find out correct match.

	pO_2 (in mm Hg)	pCO_2 (in mm Hg)
Atmospheric air	...A...	...B...
Alveoli	...C...	...40...
Deoxygenated Blood	40	...D...
Oxygenated blood	...E...	40
Tissues	...F...	45

- A - 104, B - 40, C - 95, D - 45, E - 45, F - 40
- A - 159, B - 40, C - 104, D - 45, E - 95, F - 40
- A - 159, B - 45, C - 104, D - 95, C - 40, F - 45
- A - 159, B - 0.3, C - 104, D - 45, E - 95, F - 40

195. Recognise the figure and find out the correct matching.



- (a) A-systemic arteries, B-systemic veins, C-pulmonary artery, D-pulmonary vein
 (b) B-systemic arteries, A-systemic veins, D-pulmonary artery, C-pulmonary vein
 (c) C-systemic arteries, D-systemic veins, A-pulmonary artery, B-pulmonary vein
 (d) D-systemic arteries, C-systemic veins, B-pulmonary artery, A-pulmonary vein
196. In the alveoli, the factors favourable for the formation of oxyhaemoglobin are
- | | |
|----------------------|-----------------------|
| A. Low pO_2 | B. High pO_2 |
| C. Low pCO_2 | D. High pCO_2 |
| E. Lower temperature | F. Higher temperature |
| G. Low pH | H. High pH |
- (a) A, D, F, H (b) B, C, E, G
 (c) A, D, F, G (d) B, C, E, H

Direction

- (a) If both assertion and reason are true and the reason is the correct explanation of the assertion
 (b) If both assertion and reason are true, but reason is not the correct explanation of the assertion
 (c) If assertion is true, but reason is false
 (d) If both assertion and reason are false
197. **Assertion :** Cnidarian exhibit two basic body forms i.e., sessile, umbrella shaped polyp and free - swimming cylindrical medusa
Reason: Cnidarians are triploblastic with a central gastro - vascular cavity with a single opening, hypostome on mouth
 (a) (b) (c) (d)
198. **Assertion:** In flatworms, fertilization is internal and development is through many larval stages
Reason: Some parasitic flatworm absorb nutrients from the host directly through their body surface
 (a) (b) (c) (d)
199. **Assertion:** In annelids, longitudinal and circular muscles help in locomotion
Reason: Aquatic annelid like Nereis is monoecious, and possess lateral appendages, parapodia, which help in swimming
 (a) (b) (c) (d)
200. The largest phylum of Animalia is
 (a) Insecta (b) Mollusca
 (c) Arthropoda (d) Chordata