Dated :
24-06-2026

M.L. Syal's Helix Institute

S.C.O. 343-345, Top Floor, Sector 34-A, Chandigarh. Ph : 0172-2623155

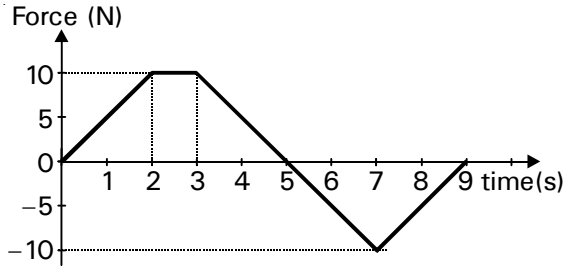
Two years regular course for Medical

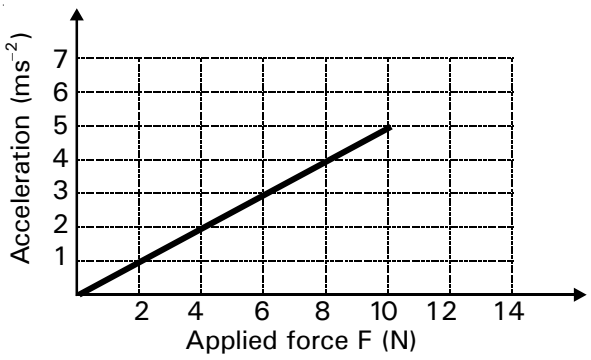
Test - 05

MM : 720 Time : 3 hrs.

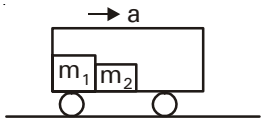
Physics	:	Laws of Motion - I
Chemistry	:	Chemical Bonding
Zoology	:	Locomotion & movement-I
Botany	:	Morphology of flowering plants-I

All questions are compulsory

1. If a force of 250 N act on body, the momentum acquired is 125 kg-m/s. What is the period for which force acts on the body?
   (1) 0.5 s (2) 0.2 s
   (3) 0.4 s (4) 0.25 s
2. A cricketer catches a ball of mass 150 gm in 0.1 sec. moving with speed 20 m/s, then he experiences force of
   (1) 300 N (2) 30 N
   (3) 3 N (4) 0.3 N
3. With what minimum acceleration can a fireman slide down a rope, whose breaking strength is 2/3rd of his weight
   (1) 2/3 g (2) g
   (3) 1/3 g (4) zero
4. 

   A body starts moving under the influence of a variable force and its force-time graph is shown above. Momentum acquired by the body in 9 seconds is
   (1) 12 Ns (2) 8 Ns
   (3) 10 Ns (4) 15 Ns
5. A machine gun of mass 10 kg fires 20 g bullets at the rate of 10 bullets per second with a speed of 500 m/s. What force is required to hold the gun in position?
   (1) 100 N (2) 200 N
   (3) 50 N (4) 25 N
6. 

   A block of unknown mass is at rest on a smooth horizontal surface. A horizontal force F is applied to the block. The graph in the figure shows the acceleration of the block with respect to the applied force. The mass of the block is
   (1) 1 kg (2) 0.5 kg
   (3) 2 kg (4) 1.5 kg

7. 

Two block of mass m_1 and m_2 are kept in a trolley moving with constant acceleration as shown in figure. The contact force between the two blocks is

(1) m_2a (2) m_1a

(3) $(m_1+m_2)a$ (4) $\left(\frac{m_2m_1}{m_1+m_2}\right)a$

8. If a rope of length L is pulled from one end by a constant force F, then tension at a distance ℓ from this end is

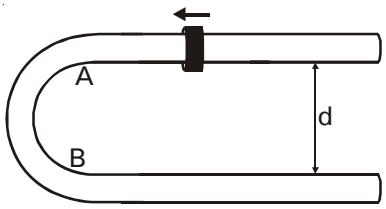
(1) $F\left(1-\frac{\ell}{L}\right)$ (2) $F\left(1+\frac{\ell}{L}\right)$

(3) $F\left(1+\frac{L}{\ell}\right)$ (4) $F\left(\frac{L}{L-\ell}\right)$

9. SI unit of linear momentum is

(1) kg m/s (2) N s

(3) both (1) and (2) (4) none of these

10. 

A fixed U-shaped smooth wire has a semi-circular bending between A and B as shown in the figure. A bead of mass m moving with uniform speed v through the wire enters the semicircular bend at A and leaves at B. The average force exerted by the bead on the part AB of the wire is

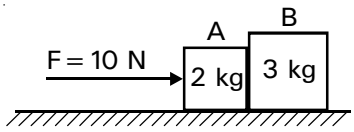
(1) 0 (2) $\frac{4mv^2}{\pi d}$

(3) $\frac{2mv^2}{\pi d}$ (4) $\frac{2mv}{\pi d}$

11. In a game of tug of wars, a condition of equilibrium exists. Both the teams pull the rope with a force of 10^4 N. The tension in the rope is

(1) 10^4 N (2) 10^8 N

(3) 0 N (4) 2×10^4 N

12. 

Two blocks A and B of mass 2 kg and 3 kg respectively are in contact on a frictionless table as shown in figure. A force of 10 N is applied on A, then force of contact between A and B will be

(1) zero (2) 2 N

(3) 4 N (4) 6 N

13. If momentum of a body (in kg-m/s) at time 't' is given by $p=(2t+t^3)$, where t is in seconds, the average force between t = 0 and t = 2 s is

(1) 6 N (2) 12 N

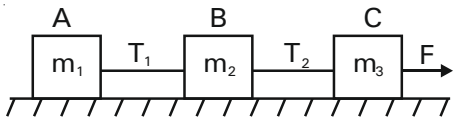
(3) 8 N (4) 24 N

14. A body of mass m is travelling with $(\hat{i}+2\hat{j})$ m/s is given an impulse of $6m\hat{j}$ Ns, the final velocity of the body in SI units will be

(1) $-\hat{i}+6\hat{j}$ (2) $\hat{i}-4\hat{j}$

(3) $\hat{i}+8\hat{j}$ (4) $8\hat{i}-\hat{j}$

15. Three blocks A, B and C tied with inextensible strings are placed on a smooth horizontal table. If a force F is applied as shown in the figure, then find tensions T_1 and T_2



(1) $\frac{m_1F}{m_1+m_2+m_3}, \frac{(m_1+m_2)}{m_1+m_2+m_3}F$

(2) $\frac{m_1F}{m_1+m_2+m_3}, \frac{m_2F}{m_1+m_2+m_3}$

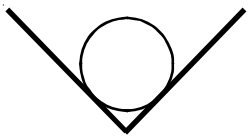
(3) $\frac{m_1F}{m_1+m_2+m_3}, \frac{(m_1+m_3)F}{m_1+m_2+m_3}$

(4) none of the above

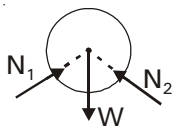
16. An object is moving due north with an increasing speed. From only this information one can conclude
(1) that there is a single force on the object directed due north
(2) that there is a net force on the object directed due north
(3) that there may be several forces on the object, but the largest must be directed due north
(4) nothing about the forces on the object

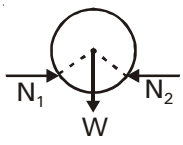
17. A force of 100 dynes acts on mass of 5 gm for 10 seconds. The velocity produced is
(1) 2 cm/s (2) 20 cm/s
(3) 200 cm/s (4) 2000 cm/s

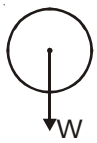
18. A jeep is moving along a straight road at constant speed. If a person in it throws an apple vertically upwards, the apple falls
(1) ahead
(2) to his side
(3) behind him
(4) exactly in his hands

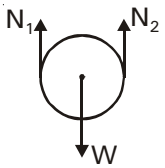
19. 

A cylinder of weight W is resting on a V groove as shown in figure. Its free body diagram is

(1) 

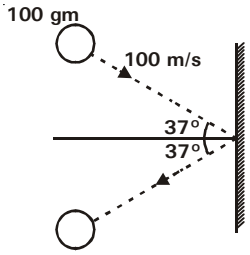
(2) 

(3) 

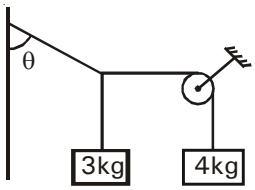
(4) 

20. A ball of mass 0.2 kg is thrown normally against a wall with a speed of 20 m/s. It rebounds normally with a speed of 15 m/s. The impulse of the force by the ball on the wall is
(1) 0.35 Ns (2) 0.7 Ns
(3) 7 Ns (4) 70 Ns

21. A force F (in N) is related to the time (in seconds) for which it acts by the equation $F = 2t + 3t^2$, then the impulse generated in first 5 seconds is
(1) 50 Ns (2) 75 Ns
(3) 150 Ns (4) 175 Ns

22. 

A 100 gm iron ball having velocity 100 m/s collides with a wall at an angle 37° to the normal and rebounds with the same speed and angle as shown. If the period of contact between the ball and wall is 0.08 s, then force experienced by the wall is
(1) 10 N (2) 100 N
(3) 200 N (4) 20 N

23. 

In shown system, each of the block is at rest, the value of θ is
(1) $\tan^{-1}(1)$ (2) $\tan^{-1}(3/4)$
(3) $\tan^{-1}(4/3)$ (4) $\tan^{-1}(3/5)$

24. A dish of mass 10 g is kept floating horizontally in the air by firing bullets each of mass 5 g with the same velocity. The bullets hits the surface of dish normally. If 10 bullets are fired per second and the bullets rebound with the same speed, then the speed of each bullet is

(1) 196 cm/s (2) 98 cm/s
(3) 49 cm/s (4) none of these

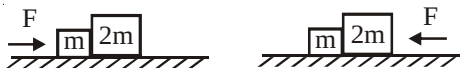
25. A 60 kg man stands on a weighing scale in the lift. At some instant he finds, scale reading has changed from 60 kg to 50 kg for a while and then comes back to the original mark. What should we conclude?

(1) The lift was in uniform motion upwards
(2) The lift was in uniform motion downwards
(3) The lift while in uniform motion upwards, is stopped suddenly
(4) The lift while in uniform motion downwards, is suddenly stopped

26. A body of mass 5 kg is acted upon by two forces 8 N and 6 N. The magnitude of the acceleration of the body can never be

(1) 2 .8 m/s^2 (2) 2 m/s^2
(3) zero (4) 0.4 m/s^2

27. Two blocks of mass 'm' and '2m' are in contact on a frictionless table. Same force F is applied on the system in two different ways shown. The ratio of contact force between the blocks in case (I) to that in case (II) will be



case (I) case (II)

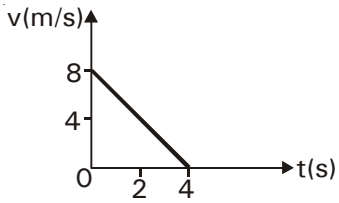
(1) 1 : 2 (2) 2 : 1
(3) 1 : 1 (4) 2 : 3

28. Action and reaction do not cancel each other because

(1) they are not equal
(2) they are not opposite
(3) they act on different bodies
(4) all of these

29. A particle of mass 'm' is made to move with uniform speed 'v' along the perimeter of a regular hexagon. Magnitude of impulse applied at each corner is

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

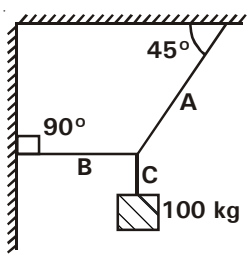
30. 

The velocity-time graph for an elevator moving vertically upward is shown in figure. The apparent weight of a body of mass 2 kg as recorded by a weighing machine inside will be

(1) 16 N (2) 20 N
(3) 24 N (4) Zero

31. **Assertion**: A cloth covers a table. Some dishes are kept on it. The cloth can be pulled out without dislodging the dishes from the table.
Reason: For every action there is an equal and opposite reaction.

(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

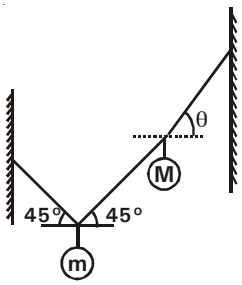
32. 

A 100 kg block is suspended with the help of three strings A, B and C. The tension in the string B is

(1) 500 N (2) 1000 N

(3) 200 N (4) $1000\sqrt{2}$ N

33. Two masses m and M are attached to the strings as shown in figure. If system is in equilibrium, then



(1) $\tan\theta = 1 + \frac{2M}{m}$ (2) $\tan\theta = 1 + \frac{2m}{M}$

(3) $\cot\theta = 1 + \frac{2M}{m}$ (4) $\cot\theta = 1 + \frac{2m}{M}$

34. Suppose a fixed force is applied for a certain interval of time on two bodies of different masses, initially at rest.

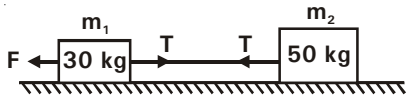
a. the lighter body picks up a greater speed than the heavier body

b. both bodies pick up same speed

c. at the end of the time interval, each body acquires the same momentum

(1) Both a and c (2) Both b and c

(3) a only (4) b only

35. 

Two masses m_1 and m_2 are connected by a massless string as shown in figure above. Find the value of tension in the string if a force of 200 N is applied as shown

(1) 110 N (2) 105 N

(3) 120 N (4) 125 N

36. A body continues moving uniformly as long as the resultant force acting on it is

(1) increasing

(2) decreasing

(3) zero

(4) perpendicular to its velocity

37. Newton's first law of motion describes the following

(1) energy (2) work

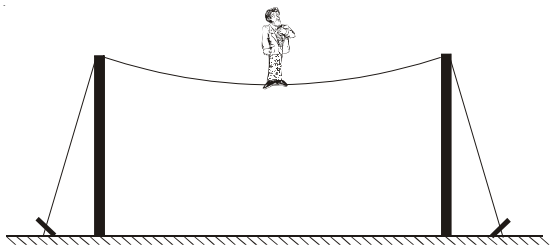
(3) inertia (4) moment of inertia

38. An engine pulls a train with 80 compartments with a force 8000 N. What is the tension in the cable connecting 30^{th} and 31^{st} compartment starting from engine?

(1) 8000 N (2) 5000 N

(3) 3000 N (4) Zero

39. A circus performer of weight W is walking on a "high wire" as shown. Assume that wire is very tight. Tension in the wire



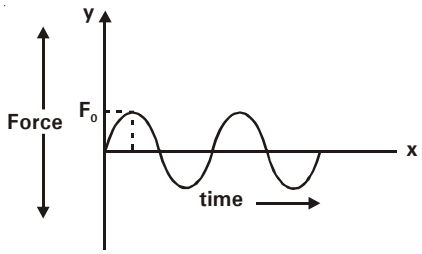
(1) is approximately W

(2) is much less than W

(3) is much more than W

(4) depends on whether he stands on one foot or two feet

40. A force F varies with time as shown in figure. The average force is



(1) Zero (2) $\frac{F_0}{\sqrt{2}}$

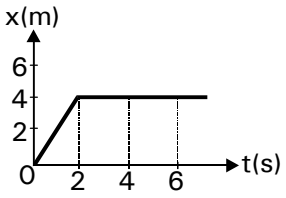
(3) $\frac{F_0}{\pi}$ (4) $2F_0$

41. Ratio of 1 N force to 1 dyne force is
(1) 10^2 (2) 10^5
(3) 10^3 (4) 10^4

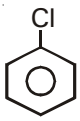
42. The momentum of the system can be changed by
(1) internal forces only
(2) external forces only
(3) both internal and external forces
(4) neither internal nor external forces

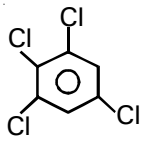
43. A force vector applied on a mass is represented as $\vec{F} = 6\hat{i} - 8\hat{j} + 10\hat{k}$ and accelerates with $1 m/s^2$. What will be the mass of the body
(1) $10\sqrt{2}$ kg (2) $2\sqrt{10}$ kg
(3) 10 kg (4) 20 kg

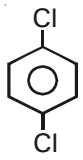
44. Newton's second law gives the measure of
(1) acceleration
(2) force
(3) momentum
(4) angular momentum

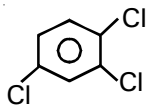
45. 

In the given figure, the position-time graph of a particle of mass 0.1 kg is shown. The impulse at $t = 2s$ is
(1) 0.2 kg m/s (2) −0.2 kg m/s
(3) 0.1 kg m/s (4) −0.4 kg m/s

46. Dipole moment of  is same as

(1) 

(2) 

(3) 

(4) both 1 & 3

47. The molecular electronic configuration of He_2 is
(1) $(\sigma 1s)^2$ (2) $(\sigma 1s)^2 (\sigma^* 1s)^2$
(3) $(\sigma 1s)^2 (\sigma^* 1s)^1$ (4) $(\sigma 1s)^3$

48. In anti-bonding molecular orbital probability
(1) increases by $2\psi_A\psi_B$
(2) decreases by $2\psi_A\psi_B$
(3) increases by $5\psi_A\psi_B$
(4) decreases by $5\psi_A\psi_B$

49. The set of degenerate orbitals for a homonuclear molecule is
(1) σ 1s and σ^* 1s (2) $\pi 2p_x$ and $\pi 2p_y$
(3) $\pi 1p_x$ and $\pi 2p_z$ (4) $\sigma 2p_z$ and $\pi 2p_x$

50. **Statement-I** : $BeCl_2$ has polar bonds and it is a polar molecule.
Statement-II : Dipole moment is a measure of polarity of a bond.
(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

51. Which of these can not form H-bond with its other molecule?
(1) CH_3CH_2OH (2) CH_3OCH_3
(3) H_2O (4) NH_3

52. How many of the following statements are correct ?
a. HOMO in N_2 molecule is $\sigma 2p_z$
b. 2s–2p mixing is operative in O_2 and NO
c. LUMO in N_2 is σ 1s
d. Bond order of peroxide ion is 1
e. LUMO in N_2 is $\pi^* 2p_x$
(1) a, c, d (2) a, d, e
(3) d, e (4) b, c, d

53. Among LiCl, $BeCl_2$, BCl_3 and CCl_4, the covalent bond characteristics follow the decreasing order
(1) LiCl > BCl_3 > $BeCl_2$ > CCl_4
(2) CCl_4 > BCl_3 > $BeCl_2$ > LiCl
(3) LiCl > $BeCl_2$ > CCl_4 > BCl_3
(4) $BeCl_2$ > LiCl > BCl_3 > CCl_4

54. The dipole moment of HCl is 1.03 D and the interatomic spacing is 1.25 Å . The percentage of ionic character of HCl is
(1) 17 (2) 21.5
(3) 30.5 (4) 83

55. How many of the following has greater covalent character than NaCl
AgCl, CuCl, $MgCl_2$, NaBr, NaI, NaF,
(1) 3 (2) 4
(3) 5 (4) 6

56. The dipole moment of AB_2 molecule is zero. The hybridisation of A can be
(1) sp (2) sp^3
(3) sp^3d (4) both (1) & (3)

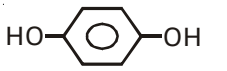
57. Which of the following molecules has "NON ZERO" dipole moment value?
(1) CCl_4 (2) HI
(3) CO_2 (4) BF_3

58. **Assertion** : SO_2 is polar whereas SO_3 is non-polar.
Reason : SO_2 and SO_3 both have same hybridisation of sulphur.
(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

59. A molecule AB_4 is isostructural with non-polar CH_4. The bond moment of A–B is 1.2 D and bond length is 1 Å . The charge developed on central atom of AB_4 is (neglecting any orbital dipoles)
(1) 1.2×10^{-10} esu
(2) 1.6×10^{-19} C
(3) 3.6×10^{-10} esu
(4) zero charge

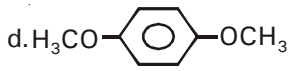
60. The dipole moment values of HA, HB, HC and HD are 2.03, 1.08, 1.57 and 0.57 debye respectively. The most electronegative element is
(1) A (2) B
(3) C (4) D

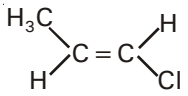
61. For which of the following molecules $\mu \neq 0$?

a. 

b.

c.

d. 

e. 

(1) a, d and e (2) b, d and e
(3) a, b, c and d (4) b, and e

62. Identify mismatch

	Column-I	**Column-II**
	molecular orbitals	**nodal planes**
(1)	$\sigma(2s)$	0
(2)	$\sigma^*(2p_z)$	1
(3)	$\pi^*(2p_x)$	2
(4)	$\pi(2p_x)$	0

63. Out of CuCl & NaCl, which is more soluble in water?
(1) CuCl
(2) NaCl
(3) CuCl and NaCl have same solubility
(4) CuCl and NaCl are insoluble in organic solvents

64. Which of the following is correct?
(1) O_2^{2-} is more stable than O_2^{2+}
(2) N_2^{2-} is more stable than N_2^{+}
(3) O_2^{+} is more stable than O_2^{-}
(4) O_2 is more stable than O_2^{2+}

65. Which of the following have bond order $= 3$?
(1) N_2^+ (2) NO^+
(3) O_2^- (4) O_2^{2-}

66. The correct order of melting point for given compounds is NaF, NaCl, NaBr, NaI
(1) NaF < NaCl < NaBr < NaI
(2) NaI < NaBr < NaCl < NaF
(3) NaCl < NaF < NaBr < NaI
(4) NaI < NaCl < NaBr < NaF

67. Which of the following is incorrect w.r.t property indicated?
(1) Stability of $NO^+ > NO$
(2) Bond length of $NO > NO^+$
(3) Stability of $CO > CO^+$
(4) Bond length of $CO > CO^+$

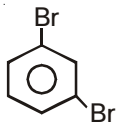
68. Given below are two statements:
Statement I: A hypothetical diatomic molecule with bond order zero is quite stable.
Statement II: As bond order increases, the bond length increases.
In the light of the above statements, chose the most appropriate answer from the options given below:
(1) Both statement I and Statement II are true
(2) Both statement I and Statement II are false
(3) Statement I is true but Statement II is false
(4) Statement I is true but Statement II is true

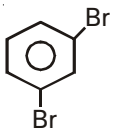
69. The species having two unpaired electrons are
(1) O_2 (2) O_2^+
(3) O_2^- (4) Both (2) and (3)

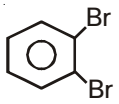
70. The fact that carbon dioxide has no dipole moment indicates that the molecule is
(1) Covalently bonded
(2) Ionically bonded
(3) Angular in shape
(4) Linear and Symmetrical

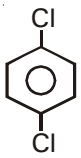
71. Which of these anions has maximum polarisability?
(1) N^{3-} (2) O^{2-}
(3) F^- (4) All have same

72. Which of the following has maximum dipole moment ?

(1) 

(2) 

(3) 

(4) 

73. The order of formation of stronger H-Bonds is
(1) O > F > N > Cl (2) F > N > O > Cl
(3) Cl > N > O > F (4) F > O > N > Cl

74. Which one of the following has only covalent bonds?
(1) NH_4Cl (2) NaCl
(3) KCl (4) CH_4

75. Which one of the following statements is incorrect w.r.t. dipole moment of polyatomic molecule?
(1) It is a vector quantity
(2) 1 Debye (D) = 3.3×10^{-30} C m
(3) dipole moment depends only on the individual bond moments
(4) dipole moment not only depends on the individual bond moments but also on the spatial arrangement of various bonds in the molecule

76. Which of the following represents the order of filling of the molecular orbitals of molecules with total electrons > 14
(1) $\pi_{2p_x} = \pi_{2p_y} < \sigma_{2p_z} < \pi^*_{2p_x} = \pi^*_{2p_y} < \sigma^*_{2p_z}$
(2) $\sigma_{2p_z} < \pi_{2p_x} = \pi_{2p_y} < \pi^*_{2p_x} = \pi^*_{2p_y} < \sigma^*_{2p_z}$
(3) $\sigma_{2p_z} = \pi_{2p_x} = \pi_{2p_y} < \pi^*_{2p_y} = \pi^*_{2p_z} < \sigma^*_{2p_x}$
(4) $\pi_{2p_x} < \pi_{2p_y} < \sigma_{2p_z} < \pi^*_{2p_y} < \pi^*_{2p_x} = \sigma^*_{2p_z}$

77. The strongest hydrogen bonding in liquid phase is shown by
(1) CH_4 (2) HI
(3) HF (4) NH_3

78. **Assertion** : Covalent character in ionic compounds is proportional to polarisation occuring in electron cloud of anion.
Reason : Anion of larger size has high polarisability.
(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

79. Elements whose electronegativities are 2.1 and 2.5, combine together to form
(1) ionic bond (2) covalent bond
(3) coordinate bond (4) metallic bond

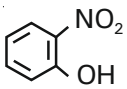
80. Which of the following moelcules does not follow the same order of energies of molecular orbitals as that of N_2
(1) C_2 (2) B_2
(3) F_2 (4) BN

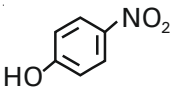
81. Which of the following molecule does not exist?
(1) H_2^+ (2) He_2
(3) Li_2^+ (4) C_2

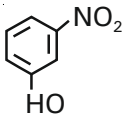
82. Which is incorrect about C_2 molecule?
(1) It has bond order of 2
(2) It has one sigma and one pi bond
(3) It has 2 pi bonds
(4) Both 1 and 3

83. Which one of the following statement is correct?
(1) B.M.O. is lowered by the same amount of energy by which ABMO is raised
(2) B.M.O. is lowered by greater amount of energy than the amount by which ABMO is raised
(3) B.M.O. is lowered by less amount of energy than the amount by which ABMO is raised
(4) Any one of the above is possible

84. Intramolecular hydrogen bonding is present in

(1) 

(2) 

(3) 

(4) HF

85. The orbital dipole due to lone pair is in the same direction as the resultant dipole moment of the other bonds in

(1) NF_3 (2) BF_3
(3) NH_3 (4) $AlCl_3$

86. A molecule is unstable if
(N_b = No. of electrons in bonding molecular orbital and N_a = No. of electrons in anti-bonding molecular orbital)

(1) $N_b < N_a$ (2) $N_b > N_a$
(3) $N_b = N_a$ (4) Both (1) and (3)

87. Which of the following molecule/molecules are non polar though orbital dipole due to lone pair is/are present?

a. NF_3 b. BF_3
c. XeF_4 d. XeF_2
(1) b, c and d (2) c and d
(3) a, b, c and d (4) only a

88. State true or false

(i) If AB_4 molecule has $\mu = 0$, then hybridisation of A can be sp^3 only
(ii) Bonding molecular orbital is formed by constructive interference of electron waves
(iii) H_2^+ is more stable than H_2^-
(iv) O_2^- is paramagnetic

(1) TFTF (2) FTTT
(3) TTTT (4) FTFT

89. Which one of the following has highest dipole moment?

(1) CF_4 (2) CCl_4
(3) SiF_4 (4) SF_4

90. Match the species in column-I with the bond order in column-II

Column-I	**Column-II**
i. NO	a. 1.5
ii. CO	b. 2.0
iii. O_2^-	c. 2.5
iv. O_2	d. 3.0

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

91. Knee joint and elbow joints are examples of
(1) Saddle joint
(2) Ball and socket joint
(3) Pivot joint
(4) Hinge joint

92. Which of the following bone contains cavity called as sella turcica?

(1) Ethmoid (2) Sphenoid
(3) Temporal (4) Frontal

93. Which of the following option is correct ?
(1) All movements are locomotion but all locomotions are not movements
(2) Flagellar movement helps in swimming of human sperm
(3) Movement and locomotion are entirely separate phenomenon
(4) Most of our internal tubular organs are lined by flagellated epithelium

94. Which of the following statement(s) is/are correct w.r.t cartilage?
(1) Cartilage is specialised connective tissue
(2) Cartilage cells are present in lacunae
(3) Matrix of cartilage is solid, pliable and resists compression.
(4) Growth of cartilage is always from peripherhy i.e, unidirectional

95. If we do not count bones of the pectoral girdle, how many bones will be left in the human skeleton?

(1) 200 (2) 202
(3) 204 (4) 205

96. Matrix of bone is very hard due to _____ while that of cartilage is slightly pliable due to _____.
(1) Calcium salts, Chondroitin salts
(2) Magnesium salts, Calcium salts
(3) Chondroitin salts, Magnesium salts
(4) Chondroitin salts, Calcium salts

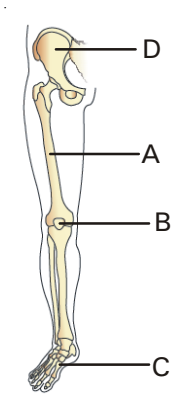
97. The supportive skeletal structures in the human external ears and in the nose tip are examples of
(1) Cartilage (2) Ligament
(3) Areolar tissue (4) Bone

98. The ear ossicles of a mammal are arranged in one of the following orders starting from the tympanum inwards?
(1) Malleus, incus, stapes
(2) Malleus, stapes, incus
(3) Incus, malleus, stapes
(4) Stapes, incus, malleus

99. The layer that surroundes the bone is known as
(1) periosteum (2) endosteum
(3) chondrocytes (4) perichondrium

100. **Assertion** : The vertebral column protects the brain and spinal cord, supports the head and serves as the point of attachment for the ribs and musculature.
Reason : Vertebral column extends from base of skull and constitutes main framework of trunk .
(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

101. Choose the incorrect option w.r.t given diagram.



(1) A – Femur : thigh bone : articulates with acetabulum
(2) B - Patella : knee cap : Cup shaped
(3) C - Tarsals : Ankle bones : 7 in number
(4) D - Coxal bone: hip girdle : articulate with axial skeleton

102. Which of the following is not a function of the skeletal system?
(1) Locomotion
(2) Production of erythrocytes
(3) Storage of minerals
(4) Production of body heat

103. What kind of movements is not exhibited by the cells of the human body?
(1) Leucocytes — Amoeboid movement
(2) Jaws — Muscular movement
(3) Trachea — Ciliary movement
(4) Ovum — Flagellar movement

104. Select the incorrect option in given table

	Bones	No.	Feature
(1)	Pectoral girdle	4	Clavicle & scapula
(2)	Vertebral column	26	Protects spinal cord
(3)	Skull bones	22	Axial skeleton
(4)	Carpals	8	Palm bones

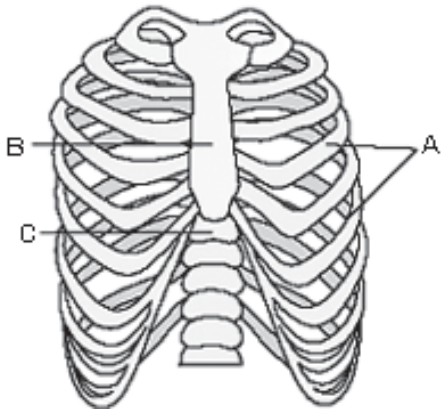
105. If the bones of middle ear, pelvic girdle, ribs, pectoral girdle, hindlimbs, phalanges and skull in the body are arranged according to their decreasing number, which bone will be at third place?
(1) ribs
(2) phalanges
(3) skull
(4) middle ear

106. Match the column I and II and choose the correct option

	Column-I		Column-II
a.	Neural canal	i.	Present in skull near eye
b.	Pubic symphysis	ii.	First cervical vertebrae
c.	Hyoid	iii.	Present in vertebral column
d.	Atlas	iv.	Contain white fibrous cartilage
e.	Lacrymal	v.	Base of buccal cavity

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

107. In the given diagram A, B, C are respectively



(1) Ribs, sternum, vertebral column
(2) Sternum, ribs, vertebral column
(3) Ribs, vertebral column, sternum
(4) Sternum, vertebral column, ribs

108. Match the Column-I with Column-II and select the correct option

	Column-I		Column-II
a.	Acetabulum	i.	Located below acromion process
b.	Glenoid cavity	ii.	Occur between pubis and ischium
c.	Acromion process	iii.	Articulation point for femur
d.	Obturator foramen	iv.	Articulates with clavicle

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

109. Which one of the following is an incorrect matching of three items and their grouped category.
(1) Ilium, Ischium, Pubis : Coxal bone
(2) Atlas, axis : Vertebrae
(3) Parietal, frontal, vomer: Cranial bones
(4) Humerus, radius, carpals: Forelimb

110. **Assertion** : There are seven pairs of vertebrosternal, three pairs of vertebrochondral and two pairs of vertebral ribs.
Reason : Each rib is a flat thin bone and all the ribs are connected dorsally to the thoracic vertebrae and ventrally to the sternum .
(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

111. Choose an odd member amongst a,b,c and select the right option
a. **Bones present dorsally in body** – Lumber, Scapula, Nasals
b. **Components of axial skeleton** – Ribs, Patella, Ear ossicles
c. **Unpaired bones** – Hyoid, Vomer, Maxilla
(1) Scapula, Patella, Vomer
(2) Lumber, Ribs, Maxilla
(3) Nasals, Patella, Maxilla
(4) Lumber, patella, Maxilla

112. Which of the following statement is incorrect?
(1) Synovial joints are characterised by presence of fluid filled cavity between the articulating surface of two bones
(2) Head of humerus fits into glenoid cavity of pectoral girdle
(3) Lumber curve is responsible for erect posture and bipedal locomotion
(4) Sternum is triangular bone situated in dorsal part of thorax between second and seventh ribs

113. Which of the following statements are correct w.r.t joints?
a. Point of attachment between two bones or a bone and cartilage.
b. Joints are essential for all types of movements in the human body
c. All joints are equally movable.
d. Synovial joints play a significant role in locomotion.
(1) a, b & c (2) b, c & d
(3) a, c & d (4) a & d

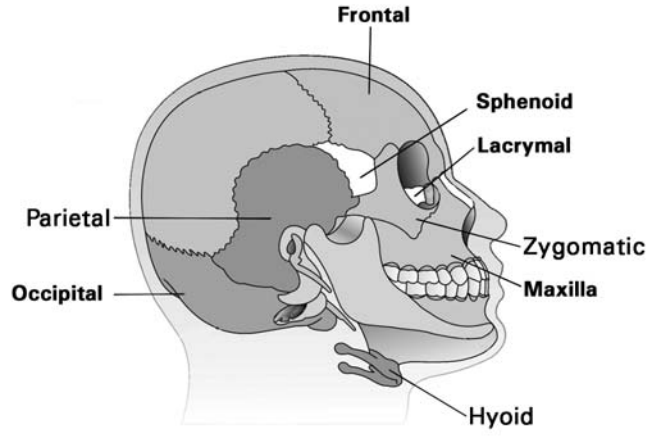
114. The pivot joint between atlas and axis is a type of
(1) Synovial joint
(2) Ball and socket joint
(3) Fibrous joint
(4) Cartilaginous joint

115. Which of the following statements are incorrect ?
a. Skeletal system plays a significant role in movement such as walking and chewing food.
b. Skull, vertebral column, sternum and ribs together form the appendicular skeleton.
c. All types of joints can be observed in each forelimb
d. Skull region articulates with the superior region of vertebral column with the help of two condyles
e. Axial skeleton comprises 86 bones distributes along the main axis of the body.
(1) a, b, c & e (2) b,c & e
(3) a, c & e (4) c & d only

116. Large quantity of _____matter in the bones of children make the bones_____
(1) inorganic, more flexible
(2) organic, rigid and hard
(3) organic, more flexible
(4) both 2 and 3

117. Vertebral column formula is
(1) $C_7\ T_{12}\ L_5\ S_{(5)}\ Co_{(4)}$
(2) $C_7\ T_{12}\ L_5\ S_5\ Co_4$
(3) $C_7\ T_{12}\ L_4\ S_4\ Co_5$
(4) $C_7\ T_{12}\ L_4\ S_5\ Co_5$

118. In given diagram of human skull, how many of the cranial bones are correctly marked?



(1) 5 (2) 3
(3) 4 (4) 2

119. How many statements are true?
a. Most of the cartilage in vertebrate embryos are replaced by bones
b. Chondrocytes are enclosed in small cavities called lamella within the matrix
c. Intervertebral disc and pubic symphysis is type of white fibrocartilage
d. Mammalian skull in monocondylic
e. Two principal divisions of skeletal system are axial and appendicular skeleton
(1) Four (2) Three
(3) One (4) Five

120. What is the correct sequence in which you will see the bones moving from top to bottom of skull?
(1) Parietal - frontal - zygomatic - mandible
(2) Parietal - frontal - mandible - maxilla
(3) Occipital - sphenoid - frontal - maxilla
(4) Frontal - parietal - sphenoid - mandible

121. "Locomotory structures need not be different from those affecting other types of movement". This can be examplified by
(1) Tentacles in *Hydra*
(2) Cilia in *Paramecium*
(3) Limbs in Humans
(4) All of the above

122. Which of the following is/are correct w.r.t. rib cage?
(1) Made up of 37 bones
(2) Formed by thoracic vertebrae, ribs and sternum
(3) Plays a significant role in breathing movements
(4) All of these

123. Choose the correct type of movement in which the following events are occuring in human body.
a. Pseudopodia is formed
b. Streaming of protoplasm
c. Role of microfilaments
(1) Flagellar movement
(2) Ciliary movement
(3) Muscular movement
(4) Amoeboid movement

124. Which of the following is a correct match?
(1) Sternum – Flat bone on the dorsal mid line of thorax
(2) Clavicle – A long slender bone with two curvatures on dorsal side
(3) Scapula – A dorsal large, flat, bone with a triangular body
(4) All are correctly matched

125. Identify the correct statements.
a. Pelvic girdle consists of two coxal bones
b. Thigh bone articulates in the cavity formed at the point of fusion of ilium, ischium and pubis.
c. The two halves of pelvic girdle meet ventrally to form pubic symphysis.
d. Knee joint is formed by femur, patella and fibula
(1) a, b & c (2) a, & c
(3) a, b & d (4) b, c & d

126. Which of the following set of bones of axial skeleton are paired in our body?
(1) Ethmoid, Zygomatic, Hyoid,
(2) Occipital, Radius, Patella,
(3) Tibia, Sternum, Coxal bone,
(4) Maxilla,Lacrymal, Parietal

127. **Statement-I** : Force generated by muscles is used to carry out movement through joints, where joint act as fulcrum.

Statement-II : Synovial joints allow considerable movements & play significant role in locomotion.

(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

128. Which of the following statement/s is/are correct?

a. Each vertebra has central hollow portion through which spinal cord passes
b. The female pelvis is larger and broader than the male pelvis
c. Sutures are white fibrous cartilage that helps flat skull bones to fuse end to end
d. Thumb is present towards radius whereas ulna towards little finger
e. Facial region consists of 14 skeletal elements

(1) b, d and e only (2) a and b only
(3) b, c and e only (4) a, b, d and e

129. Part of shoulder blade that articulates with collar bone and humerus respectively are

(1) Glenoid cavity and acromion process
(2) Capitulum and glenoid cavity
(3) Acromion process and Glenoid cavity
(4) Acromion process and acetabulum

130. **Statement-I** : A voluntary movement which causes the animal to change its place, is called locomotion.

Statement-II :Animals move generally in search of food, shelter, mate, breeding ground, better climate or to protect themselves.

(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

131. Which of the following set is required for a perfect coordination during locomotion?

(1) Neural, Muscular, Digestive
(2) Neural, Muscular, Respiratory
(3) Muscular, Skeletal, Neural
(4) Muscular, Skeletal, Circulatory

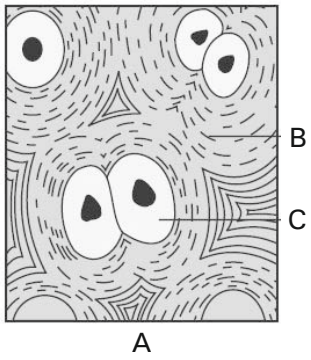
132. Which of the following option is incorrect?

(1) Knee cap, sternum and pubic symphysis are ventrally placed in the body
(2) Pelvic girdle articulates with vertebral column while pectoral girdle does not
(3) Ribs have two articulation surfaces on dorsal end so called bicephalic
(4) Number of cervical vertebrae is seven in all mammals

133. Which of the following is an incorrect match w.r.t bone and its shape?

(1) Hyoid – U
(2) Sternum – Dagger
(3) Malleus – Anvil
(4) Stapes – Stirrup

134. In the given diagram, A, B and C are respectively



(1) Cartilage, Collagen fibres, Chondrocyte
(2) Bone, Elastin fibres, Osteocyte
(3) Chondrocyte, Cartilage matrix, Collagen fibres
(4) Bone, Collagen fibres, Osteocyte

135. How many bones will be lost from Pelvic girdle, if all the bones from the following are omitted?

Humerus, Tarsals, Ileum, clavicle and sacrum

(1) 3 (2) 2
(3) 1 (4) none

136. Which of the following plants donot have stem tendrils?

(1) Watermelon
(2) Pumpkin
(3) Grape
(4) *Euphorbia*

137. What are biennials?

(1) Plants that remain vegetative in first growing season but produce flowers in the next season
(2) Plants that produce flowers twice during their life cycle
(3) Plants that flower many times during their life time
(4) Plants that complete their life cycle in one growing season only

138. Identify the incorrect statement
(1) The cell of the elongation zone gradually differentiate and mature
(2) The primary roots and its branches constitute the tap root system
(3) In Banyan, many roots come out of the ground and help to get oxygen for respiration
(4) The root hairs absorb water and minerals from the soil

139. Which of the following is not a stem modification?
(1) Spines
(2) Tendril
(3) Thorns
(4) Phylloclade

140. A root is distinguished from a stem as it
(1) does not have buds
(2) grows towards gravity
(3) does not have nodes and internodes
(4) all the above

141. How many of the following are annual plants?
Mustard, Pea, Wheat, Mango, Ginger, Banana, Rose
(1) One
(2) Two
(3) Three (4) Five

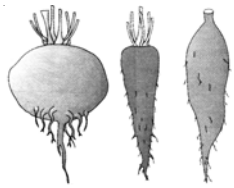
142. In which plant stem becomes flattened,green and perfoms the function of photosynthesis?
What is such a modification called?
(1) *Opuntia* – phylloclade
(2) *Asparagus* – spine
(3) *Euphorbia* – phylloclade
(4) Potato – thorn

143. Roots called **pneumatophores**
(1) help to get oxygen for respiration
(2) help in reproduction
(3) provide mechanical strength
(4) all the above

144. Which of the following is a plant in which the root part is NOT modified for food storage?
(1) Sweet potato
(2) Radish
(3) Ginger
(4) *Asparagus*

145. Which of the following plant does not have root cap protecting its negatively geotropic root?
(1) Mustard (2) *Pistia*
(3) *Lemna* (4) *Rhizophora*

146. Match the modification of roots in column I with their functions in column II.

Column I		Column II
a.		p. respiration
b.		q. support
c.		r. storage

(1) a-r, b-p, c-q (2) a-q, b-r, c-p
(3) a-p, b-r, c-q (4) a-r, b-q, c-p

147. How many of the following are modified or types of stems?
Tuber, Tendril, Phylloclade, Thorn, Pneumatophores
(1) Six (2) Four
(3) Two (4) Three

148. How many of the following plants are monocarpic?
Mustard, *Agave*, Bamboo, Pea, Carrot, Turnip, Mango
(1) 7 (2) 6
(3) 3 (4) 2

149. Which of the following is incorrect for the characteristic features of stem?
(1) It develops from plumule of embryo
(2) It is generally an aerial and ascending part of the plant axis
(3) Its apex bears a terminal bud for growth in width
(4) It is differentiated into nodes and internodes

150. **Assertion** : Thorns of *Bougainvillea* and tendrils of *Cucurbita* are homologous structures.
Reason : Both of these arise from axillary buds .
(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

151. Possible variations in different parts of the plant are due to adaptations for

a. Protection b. Climbing

c. Storage d. Habitat

(1) a, b, c not d (2) b, c not a, d

(3) a, b, c, d (4) a, c not b , d

152. Roots developed from parts of the plant other than radicle are called

(1) Tap roots (2) Fibrous roots

(3) Adventitious roots (4) Nodular roots

153. Sweet potato is a modified

(1) stem (2) adventitious root

(3) rhizome (4) tap root

154. Which of the following is not a perennial plant?

(1) Mango (2) Peepal

(3) Banyan (4) Tomato

155. Pick the correct set of statements

a. Roots developed from parts other than radicle are adventitious

b. Edible part in ginger is stem

c. Cucumber and grapes have thorns

d. Stem can never perform photosynthesis

e. A stem bears only axillary buds

(1) 'd' and 'e' only (2) a' and 'b' only

(3) 'c' and 'e' only (4) a, b and c only

156. Tall perennials with hard and woody main stem called trunk are called as

(1) herbs (2) shrubs

(3) trees (4) none of these

157. **Statement-I** : Flowering plants exhibit enormous variations is shape, size, structure, mode of nutrition, life span, habit and habitat.

Statement-II : Classification of plants is based on morphology and other characteristics.

(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

158. Ginger is a stem and not a root because it

a. is differentiated into nodes and internodes

b. contains scale leaves

c. stores reserve food

(1) both a & b (2) b only

(3) a, b & c (4) both a & c

159. **Statement-I** : Cells of meristematic zone are very small, thin walled and with dense cytoplasm.

Statement-II : Zone of maturation is proximal to zone of elongation.

(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

160. Select incorrect statement w.r.t. the branching shown below in the diagram

(1) Main axis continues to grow indefinitely

(2) Branches are borne laterally

(3) Branches are borne in acropetal manner

(4) Branches are borne in basipetal manner

161. A condensed, compact shoot with a growing point covered by young overlapping leaves is known as

(1) Rhizome (2) Culm

(3) Bud (4) Caudex

162. Which one of the following statement is true?

(1) All biennials are polycarpic

(2) All annuals and biennials are monocarpic

(3) Herbs include annuals and biennials only

(4) Perennials are always polycarpic

163. Match column-A with column-B

Column-A		**Column-B**	
a.	Caudex	i.	Sugarcane
b.	Culm	ii.	*Cocos*
c.	Racemose	iii.	*Eucalyptus*

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

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

164. Which of the following pair shows correct match?

(1) Maize – Stilt roots

(3) Banyan tree – Climbing roots

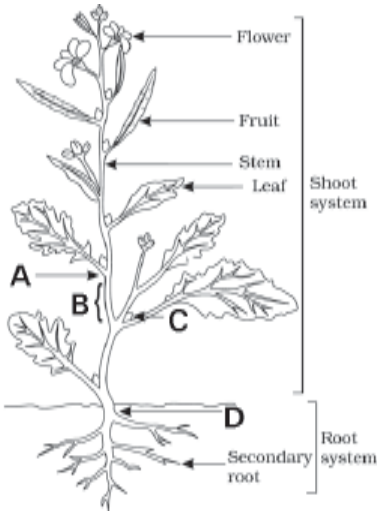
(3) Bamboo – Prop roots

(4) Sweet potato – Photosynthetic roots

165. Which one of the following type of stem is shown by Sugarcane?
(1) Culm
(2) Branched stem
(3) Cymose
(4) Caudex

166. **Assertion** : Morphology deals with the study of form and structure.
Reason : Even though the angiosperms show such a large diversity in external structure, they are all characterised by presence of roots, stems, leaves, flowers and fruits. .
(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. The parts A, B, C, D are respectively



(1) leaf, stem, internode, primary root
(2) node, internode, axillary bud, primary root
(3) internode, node, apical bud, primary root
(4) stem, internode, axillary bud, secondary root

168. In swampy areas like the Sunderbans in West Bengal, plants bear special kind of roots for breathing called
(1) pneumatophores
(2) stilt roots
(3) hygroscopic roots
(4) Photosynthetic roots

169. Rearrange the different zonations in root and choose the correct option
A. Elongation zone
B. Maturation zone
C. Meristematic zone
D. Root cap zone
E. Root hair zone
(1) A, B, C, D, E
(2) D, C, A, E, B
(3) C, A, B, D, E
(4) B, A, C, D, E

170. The roots that originate from the base of the stem are
(1) fibrous roots
(2) primary roots
(3) prop roots
(4) lateral roots

171. *Citrus* show same stem modification as shown by
(1) *Bougainvillia*
(2) Cucumber
(3) *Opuntia*
(4) Watermelon

172. Match the type of root in column-I with corresponding plants in column II.

Column I	**Column II**
a. Tap root	p. banyan tree
b. Fibrous root	q. mustard plant
c. Adventitious roots	r. wheat plant

(1) a-q, b-r, c-p (2) a-p, b-r, c-q
(3) a-q, b-p, c-r (4) a-r, b-p, c-q

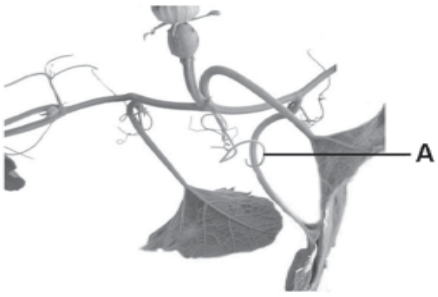
173. Underground stems will not bear on them
(1) axillary buds
(2) scale leaves
(3) root hairs
(4) nodes

174. Identify the correct option

	Plant	Modification	Function
(1)	*Citrus*	Stem tendrils	Storage of food
(2)	*Opuntia*	Phylloclade	Photosynthesis
(3)	Pumpkin	Stem thorns	Protection
(4)	*Colocasia*	Fleshy root	Storage of food

175. How many statements are correct?
a. In dicot plants, radicle gives rise to primary root
b. Wheat has the presence of tap root system
c. The only function of root system is to anchorage of plant parts in soil
d. Mustard has the presence of fibrous roots
e. Adventitious roots are found in *Monstera* and the banyan tree
(1) Three (2) Four
(3) One (4) Two

176. In the diagram given below the part of the stem which is labelled is for



(1) storage
(2) support
(3) protection
(4) vegetative propagation

177. "The root is covered at the apex by a thimble-like structure called the _____a_____ It protects the tender apex of the root as it makes its way through the soil. A few millimeters above the root cap is the region of _____b_____. The cells of this region are very small, _____c_____ and with dense protoplasm. They divide repeatedly. The cells proximal to this region undergo rapid _____d_____ and enlargement and are responsible for the growth of the root in length."

In the above paragraph a, b, c & d are respectively

(1) Root cap, meristematic activity, thin-walled, elongation
(2) Root cap, meristematic activity, thick-walled, elongation
(3) Root cap, elongation activity, thin-walled, elongation
(4) Root cap, meristematic activity, thin-walled, differentiation

178. Roots arise from parts of the plant other than the radicle called adventitious roots are not seen in

(1) grass
(2) *Monstera*
(3) banyan tree
(4) Mustard

179. Coconut palm shows

(1) caudex habit
(2) culm
(3) branched stem
(4) both (1) and (3)

180. **Statement-I** : Stem is ascending part of the axis bearing branches, leaves, flowers and fruits.

Statement-II : Stem never helps in vegetative propagation.

(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