Do not open this Test Booklet until you are asked to do so.

इसपीड़ी शरीर पूर्व को आतक करे खेले लें आतक करा न चले।

1. A seat marked with Reg. No. will be allotted to each student. The student should ensure that he/she occupies the correct seat only. If any student is found to have occupied the seat of another student, both the students shall be removed from the examination and shall have to accept any other penalty imposed upon them.

2. Duration of Test is 3 Hours and Questions Paper Contains 180 Questions. The Max. Marks are 720.

3. Student can not use log tables and calculators or any other material in the examination hall.

4. Student must abide by the instructions issued during the examination, by the invigilators or the centre incharge.

5. Before attempting the question paper ensure that it contains all the pages and that no question is missing.

6. Each correct answer carries 4 marks, while 1 mark will be deducted for every wrong answer. Guessing of answer is harmful.

7. A candidate has to write his/her answers in the OMR sheet by darkening the appropriate bubble with the help of Blue/Black Ball Point Pen only as the correct answer(s) of the question attempted.

8. Use of Pencil is strictly prohibited.

Note: In case of any Correction in the test paper, please mail to dlpcorrections@allen.ac.in within 2 days along with Paper code and Form No. Note: बाद इसे शारीर पूर्व को आतक करे खेले लें आतक करा न चले।
1. What is the percentage error in the measurement of time period of a pendulum if maximum error in the measurement of $\ell$ and $g$ are 2% and 4% respectively?
   (1) 6%  (2) 4%
   (3) 3%  (4) 5%

2. Two masses of 1 kg and 5 kg are attached to the ends of a massless string passing over a pulley of negligible weight. The pulley itself is attached to a light spring balance as shown in figure. The masses start moving during this interval; the reading of spring balance will be–
   (1) More than 6 kg.
   (2) Less than 6 kg.
   (3) Equal to 6 kg.
   (4) None of the above

3. A ball is thrown on a lawn in such a way that it initially slides with a speed $v_0$ without rolling. It gradually picks up rotation motion. Find the speed of the ball at which there will be rolling without slipping–
   (1) $\frac{2}{7}v_0$
   (2) $\frac{2}{5}v_0$
   (3) $\frac{5}{7}v_0$
   (4) $\frac{3}{5}v_0$

4. If $R$ = universal gas constant, the amount of heat needed to raise the temperature of 2 mol of an ideal monoatomic gas from 273 K to 373 K when no work is done is–
   (1) 100 R  (2) 150 R
   (3) 300 R  (4) 500 R
5. Two waves having intensity I and 9I produce interference. If the resultant intensity at a point is 7I, what is the phase difference between the two waves?
   (1) 0°   (2) 60°   (3) 90°   (4) 120°

6. The result after adding $3.8 \times 10^{-6}$ with $4.2 \times 10^{-5}$ with due regard to significant figures is:-
   (1) $4.58 \times 10^{-5}$   (2) $0.458 \times 10^{-4}$
   (3) $4.6 \times 10^{-5}$   (4) $45.8 \times 10^{-6}$

7. A block of mass m is lying on an inclined plane. The coefficient of friction between the plane and the block is $\mu$. The force $F_1$ required to move the block up the inclined plane will be–
   (1) $mg \sin \theta + \mu mg \cos \theta$
   (2) $mg \cos \theta - \mu mg \sin \theta$
   (3) $mg \sin \theta - \mu mg \cos \theta$
   (4) $mg \cos \theta + \mu mg \sin \theta$

8. A uniform solid sphere of mass m and radius r rolls without slipping down an inclined plane, inclined at an angle 45° to the horizontal. Find the magnitude of frictional coefficient at which slipping is absent—
   (1) $\frac{1}{3}$   (2) $\frac{2}{7}$   (3) $\frac{1}{5}$   (4) $\frac{1}{7}$

9. During an adiabatic process, the pressure of a gas is found to be proportional to the cube of its absolute temperature. The ratio $C_p/C_V$ for the gas is–
   (1) $\frac{3}{2}$   (2) $\frac{4}{3}$   (3) 2   (4) $\frac{5}{3}$

10. In the standing wave shown, particles at the positions A and B have a phase difference of
    (1) 0   (2) $\frac{\pi}{2}$   (3) $\frac{5\pi}{6}$   (4) $\pi$

11. In projectile motion, the modulus of rate of change of velocity—
    (1) is constant
    (2) first increases then decreases
    (3) first decreases then increases
    (4) None of the above
12. The tension $T$ in the string shown in figure is—
(1) Zero
(2) 50 N
(3) $3\sqrt{3}$N
(4) $(\sqrt{3} - 1)50$N

13. A tube of length $L$ is filled completely with an incompressible liquid of mass $M$ and closed at both the ends. The tube is then rotated in a horizontal plane about one of its ends with a uniform angular velocity $\omega$. The force exerted by the liquid at the other end is—
(1) $\frac{2M\omega}{L}$
(2) $M\omega^2$L
(3) $\frac{2M\omega^2L}{4}$
(4) $\frac{2M\omega^2}{L}$

14. A cylindrical metal rod of length $L_0$ is shaped into a ring with a small gap as shown. On heating the system

(1) $x$ decreases, $r$ and $d$ increases
(2) $x$ and $r$ increases, $d$ decreases
(3) $x$, $r$ and $d$ all increase
(4) Data insufficient to arrive at a conclusion

15. In both figures shown below a hole along the diameter of earth. In first, a particle is released from A and it oscillated with time period $T_1$. In second figure, same particle is released from point B and it oscillates with time period $T_2$ then [O is centre of earth] :-

(1) $T_1 > T_2$
(2) $T_1 < T_2$
(3) $T_1 = 2T_2$
(4) $T_1 = T_2$
16. A particle is projected vertically upwards from a point A on the ground. It takes time \( t_1 \) to reach a point B, but it still continues to move up. If it takes further \( t_2 \) time to reach the ground from point B. Then height of point B from the ground is–

\[
(1) \frac{1}{2} g(t_1 + t_2)^2 \quad (2) g t_1 t_2 \\
(3) \frac{1}{8} g(t_1 + t_2)^2 \quad (4) \frac{1}{2} g t_1 t_2
\]

17. Work done by the conservative forces on a system is equal to–

(1) The change in kinetic energy of the system
(2) The change in potential energy of the system
(3) The change in total mechanical energy of the system
(4) None of the above

18. We have two spheres one of which is hollow and the other solid. They have identical masses and moment of inertia about their respectively diameters. The ratio of their radius is given by :-

(1) \( 5 : 7 \)  
(2) \( 3 : 5 \)  
(3) \( \sqrt{3} : \sqrt{5} \)  
(4) \( \sqrt{3} : \sqrt{7} \)

19. An ideal heat engine operates on Carnot cycle between 227°C and 127°C. It absorbs \( 6 \times 10^4 \) cal at the higher temperature. The amount of heat converted into work equals to–

(1) \( 4.8 \times 10^4 \) cal  
(2) \( 3.5 \times 10^4 \) cal  
(3) \( 1.6 \times 10^4 \) cal  
(4) \( 1.2 \times 10^4 \) cal

20. A capillary tube of radius \( r \) is immersed in water and water rises in it to a height \( h \). The mass of the water in the capillary tube is \( m \). Another capillary of radius \( 2r \) is immersed in water. The mass of water that will rise in this tube is–

(1) \( \frac{m}{2} \)  
(2) \( m \)  
(3) \( 2m \)  
(4) \( 4m \)
21. A particle is released from rest from a tower of height 3 h. The ratio of times to fall equal heights h, i.e., \( t_1 : t_2 : t_3 \) is–

(1) \( \sqrt{3} : \sqrt{2} : 1 \)
(2) 3 : 2 : 1
(3) 9 : 4 : 1
(4) \( \frac{1}{\sqrt{2} - 1} \) : \( \frac{1}{\sqrt{3} - \sqrt{2}} \)

22. A 15 g ball is shot from a spring gun whose spring has a force constant of 600 N m. The spring is compressed by 3 cm. The greatest possible velocity of the ball for this compression is \( g = 10 \text{ m/s}^2 \)–

(1) 6.0 m/s
(2) 12.0 m/s
(3) 10.0 m/s
(4) 8.0 m/s

23. Two particles A and B initially at rest move towards each other under a mutual force of attraction. At the instant when velocity of A is \( v \) and that of B is \( 2v \), the velocity of centre of mass of the system is–

(1) \( v \)
(2) \( 2v \)
(3) \( 3v \)
(4) Zero

24. The K.E. and P.E. of a particle executing SHM with amplitude A will be equal when its displacement is–

(1) \( A\sqrt{2} \)
(2) \( \frac{A}{2} \)
(3) \( \frac{A}{\sqrt{2}} \)
(4) \( A\sqrt{2/3} \)

25. There are two identical small holes of area of cross-section \( a \) on the opposite sides of a tank containing a liquid of density \( \rho \). The difference in height between the holes is \( h \). Tank is resting on a smooth horizontal surface. Horizontal force which will have to be applied on the tank to keep it in equilibrium is–

(1) \( g \ h \ \rho a \)
(2) \( \frac{2gh}{\rho} \)
(3) \( 2g \ h \ \rho a \)
(4) \( \frac{\rho gh}{a} \)
26. A ball is dropped from the roof of a tower of height h. The total distance covered by it in the last second of its motion is equal to the distance covered by it in first three seconds. The value of h in meter is: (g = 10m/s²)
(1) 125 (2) 200 (3) 100 (4) 80

27. The total work done on a particle is equal to the change in its kinetic energy. This is applicable–
(1) Always
(2) Only if the conservative forces are acting on it
(3) Only in inertial frames
(4) Only when pseudo forces are absent

28. Work done in converting 1 g of ice at –10°C into steam at 100°C is–
(1) 3045 J (2) 6056 J (3) 725 J (4) 6 J

29. A body is performing simple harmonic motion with amplitude a and time period T. Variation of its acceleration (f) with time (t) is shown in figure. If at time t, velocity of the body is v, which of the following graphs is correct–

(1) \[ f = \frac{T}{2} \]
(2) \[ f = \frac{3T}{4} \]
(3) \[ f = \frac{T}{4} \]
(4) \[ f = \frac{T}{2} \]
30. An ornament weighs 10 g in air and 6 g in water. Density of material of ornament is
\[ \frac{20 \text{ g}}{20 \text{ cc}}. \] The volume of cavity in ornament is–
(1) zero (2) 3.5 cc (3) 4 cc (4) 0.5 cc

31. A projectile cover double range as compare to its maximum height attained. The angle of projection is–
(1) \( \tan^{-1} \frac{1}{2} \) (2) \( \tan^{-1} \frac{1}{4} \) (3) \( \tan^{-1} \frac{1}{3} \) (4) \( \tan^{-1} \frac{1}{5} \)

32. A car of mass 500 kg is driven with acceleration 1 m/s\(^2\) along straight level road against constant external resistance of 1000 N. When the velocity is 5 m/s the rate at which the engine is working is–
(1) 5 kW (2) 7.5 kW (3) 2.5 kW (4) 10 kW

33. Six identical conducting rods are joined as shown in figure. Points A and D are maintained at temperatures 200°C and 20°C, respectively. the temperature of junction B will be–

![Diagram of conducting rods with temperatures](image)

(1) 120°C (2) 100°C (3) 140°C (4) 80°C

34. Two masses \( m_1 \) and \( m_2 \) are supended together by a massless spring of constant \( k \). When the masses are in equilibrium, \( m_1 \) is removed without disturbing the system; the amplitude of vibration is–
(1) \( \frac{m_1 g}{k} \) (2) \( \frac{m_2 g}{k} \) (3) \( \frac{(m_1 + m_2)g}{k} \) (4) \( \frac{(m_2 - m_1)g}{k} \)
35. The self gravitational potential energy of a spherical shell of mass M and radius R is–

\[ E = \begin{cases} 
\frac{GM^2}{R} & \text{(1)} \\
\frac{GM^2}{2R} & \text{(2)} \\
\frac{3GM^2}{5R} & \text{(3)} \\
\frac{GM^2}{4R} & \text{(4)} 
\end{cases} \]

36. In the arrangement shown in figure, pulley is smooth and massless and all the strings are light let \( F_1 \) be the force exerted on the pulley in case (i) and \( F_2 \) the force in case (ii). Then

\[ \begin{align*}
(1) & \quad F_1 > F_2 \\
(2) & \quad F_1 < F_2 \\
(3) & \quad F_1 = F_2 \\
(4) & \quad F_1 = 2F_2
\end{align*} \]

37. A particle of mass \( m \) describes a circle of radius \( r \). The centripetal acceleration of the particle is \( \frac{4m}{r^2} \). What will be the momentum of the particle?

\[ \begin{align*}
(1) & \quad 2m/r \\
(2) & \quad 2m/\sqrt{r} \\
(3) & \quad 4m/\sqrt{r} \\
(4) & \quad 4m/r
\end{align*} \]

38. Hot water cools from 60°C to 50°C in the first 10 min and to 42°C in the next 10 min. The temperature of the surrounding is–

\[ \begin{align*}
(1) & \quad 50^\circ C \\
(2) & \quad 10^\circ C \\
(3) & \quad 15^\circ C \\
(4) & \quad 20^\circ C
\end{align*} \]

39. A closed organ pipe has a frequency ‘\( n \)’. If its length is doubled and radius is halved, its frequency nearly becomes–

\[ \begin{align*}
(1) & \quad \text{halved} \\
(2) & \quad \text{doubled} \\
(3) & \quad \text{tripled} \\
(4) & \quad \text{quadrupled}
\end{align*} \]
40. Mass density of a solid sphere is \( \rho \). Radius of the sphere is \( R \). The gravitational field at a distance \( r \) from the centre of the sphere inside it is–

\[
\begin{align*}
(1) & \quad \frac{4\pi G \rho r^3}{3} \\
(2) & \quad \frac{4\pi G \rho r^2}{3} \\
(3) & \quad \frac{4\rho G R^3}{3r^2} \\
(4) & \quad \frac{\rho G R^3}{\pi r}
\end{align*}
\]

41. The limiting friction between two bodies in contact is independent of–

(1) Nature of the surface in contact
(2) The area of surfaces in contact
(3) Normal reaction between the surfaces
(4) The material of the bodies

42. A hollow sphere and a solid sphere having same mass and same radius are rolled down a rough inclined plane–

(1) The hollow sphere reaches the bottom first
(2) The solid sphere reaches the bottom with greater speed
(3) The solid sphere reaches the bottom with greater kinetic energy
(4) The two spheres will reach the bottom with same linear momentum

43. One grams of \( H_2 \) at 27°C is mixed with 16 g of \( O_2 \) at 37°C. The temperature of the mixture is about–

(1) 32°C (2) 27°C (3) 37°C (4) 45°C

44. In a resonance tube experiment, the first resonance is obtained for 10 cm of air column and the second for 32 cm. The end correction for this apparatus is–

(1) 0.5 cm (2) 1.0 cm (3) 1.5 cm (4) 2 cm

45. A satellite is revolving round the earth with orbital speed \( v_0 \). If it stops suddenly, the speed with which it will strike the surface of earth would be : \( (v_e = \text{escape velocity of a particle on earth's surface}) \)

\[
\begin{align*}
(1) & \quad \frac{v_e^2}{v_0} \\
(2) & \quad v_e \\
(3) & \quad \sqrt{v_e^2 - v_0^2} \\
(4) & \quad \sqrt{v_e^2 - 2v_0^2}
\end{align*}
\]
46. Mass of NaOH required for formation of 100 ml of its decimolar solution is–
(1) 0.8 (2) 0.4 (3) 0.2 (4) 8 g

47. Equivalent amounts of H₂ and I₂ are heated in a closed vessel till equilibrium is obtained. If 80% of the hydrogen is converted to HI, the K_c at this temperature is
(1) 64 (2) 16 (3) 0.25 (4) 14

48. The product of the following reaction is–
\[ \text{NCl}_2 \text{ + 3H}_2\text{PO}_4 / \text{ethanol} \rightarrow \ ? \]
(1) OH⁻ (2) Cl⁻ (3) OC₂H₅ (4) Cl⁻

49. The element Z = 117 should
(1) be a halogen (2) have seven valence electrons (3) have a valence shell configuration of 7s² 7p⁵ (4) have all of the above properties

50. Which of the following compound is most harmful component of photochemical smog?
(1) NO₂ (2) PAN (3) SO₂ (4) CH₃NO₂

51. How much amount of Al₂O₃ will be formed when 5.4 gm of Al reacts with 10 gm of O₂?
(1) 10.2 gm (2) 20.4 gm (3) 5.1 gm (4) 9.6 gm

52. Which of the following may act as an oxidising and reducing agent both?
(1) K₂Cr₂O₇ (2) SO₂ (3) H₂S (4) NH₃
53. Decreasing order of stability of following carbocations is–
(A) m-CH$_3$OPhCH$_2^+$  (B) p-CH$_3$OPhCH$_2^+$
(C) PhCH$_2^+$  (D) p-NO$_2$PhCH$_2^+$
(1)A > B > C > D  (2)B > C > D > A
(3)C > B > A > D  (4)B > C > A > D

54. Which of the following isoelectronic series would lose an electron most easily?
(1) S$^2-$  (2) Cl$^-$
(3) Ar  (4) K$^+$

55. What changes take place in BOD of water body with increasing quantity of organic pollutants?
(1) BOD increases
(2) BOD decreases
(3) BOD first increases than decreases
(4) BOD first decreases than increases

56. ‘A’ sample of [Cu(NH$_3$)$_4$]SO$_4$ contains 2.4 × 10$^{24}$ ammonia molecules. The moles of [Cu(NH$_3$)$_4$]SO$_4$ in given sample will be–
(1) 6 × 10$^{23}$  (2) 4
(3) 3  (4) 1

57. pH of a resulting solution prepared by mixing 100 ml 0.1 M HCl and 200 ml 0.05 M NaOH is
(1) 7  (2) 6.95
(3) 7.95  (4) 8.1

58. But-1-ene →?
\[
\text{(i)} \text{CH}_3\text{COO}\text{H}\text{H}_2\text{O} \rightarrow \text{(ii) NaBH}_4
\]
The product in above reaction is–
(1) CH$_3$CH$_2$CH$_2$CH$_2$OH
(2) CH$_3$-CH$_2$-CH-CH$_3$
(3) CH$_3$=CH$_2$-CH-CH$_3$
(4) CH$_3$-CH$_2$=C-CH$_3$

53. निम्न वाले बननेवाले के स्थान पर घटना कर्म है–
(A) m-CH$_3$OPhCH$_2^+$  (B) p-CH$_3$OPhCH$_2^+$
(C) PhCH$_2^+$  (D) p-NO$_2$PhCH$_2^+$
(1) A > B > C > D  (2) B > C > D > A
(3) C > B > A > D  (4) B > C > A > D

54. निम्न लिखित तालिका में उल्लेखित घटकों का नाम नहीं।
(1) S$^2-$  (2) Cl$^-$
(3) Ar  (4) K$^+$

55. जन्म वाले बननेवाले को की मात्रा के ख़ास में वाले पर्यन्त न हो तो है?
(1) BOD घट तो है।
(2) BOD घट तो है।
(3) BOD हल्ले घट तो है।
(4) BOD हल्ले घट तो है।

56. [Cu(NH$_3$)$_4$]SO$_4$ के फ़ायदे में बाद ने 2×10$^{24}$ अभिनय आया हो तो नुक्सान हो ने? [Cu(NH$_3$)$_4$]SO$_4$ के मोल वाले हो ने?
(1) 6 × 10$^{23}$  (2) 4
(3) 3  (4) 1

57. 100 ml, 0.1 M HCl एवं 200 ml 0.05 M NaOH विल्कुल के भिन्न से प्राप्त कर्म पर्यन्त ती विल्कुल कर गया –
(1) 7  (2) 6.95
(3) 7.95  (4) 8.1

58. But-1-ene →?
\[
\text{(i)} \text{CH}_3\text{COO}\text{H}\text{H}_2\text{O} \rightarrow \text{(ii) NaBH}_4
\]
उल्लेखित फ़ायदे का उपयोग कर उपदेश है?
(1) CH$_3$CH$_2$CH$_2$CH$_2$OH
(2) CH$_3$-CH$_2$-CH-CH$_3$
(3) CH$_3$=CH$_2$-CH-CH$_3$
(4) CH$_3$-CH$_2$=C-CH$_3$
59. Which of the following molecules has highest dipole moment?
   (1) BF₃  
   (2) NH₃  
   (3) NF₃  
   (4) B₂H₆

60. Excess of which of the following in water causes blue baby syndrome disease?
   (1) SO₄²⁻  
   (2) NO₃⁻  
   (3) Ba²⁺  
   (4) Hg

61. Two separate bulbs contain ideal gases A and B. The density of gas A is 4 times that of gas B. The molecular mass of A is half that of gas B. The two gases are at the same temperature. The ratio of the pressure of A to that of gas B is—
   (1) 2  
   (2) 8  
   (3) 4  
   (4) 1/4

62. Which of the following is a buffer solution?
   (1) 100 ml 0.1 M CH₃COOH + 100 ml 0.05M NaOH  
   (2) 200 ml 0.1 M NH₄OH + 200 ml 0.08M HCl  
   (3) 300 ml 0.1 M NaOH + 500 ml 0.1M C₆H₅COOH  
   (4) All of these

63. Number of structural isomers of C₃H₆O :
   (1) 2  
   (2) 3

64. Which of the following pair of compounds with isostructural?
   (1) CO₂ and SO₂  
   (2) SiF₄ and SF₄  
   (3) XeF₂ and I₃⁻  
   (4) SF₆ and XeF₆

65. Incorrect statement is
   (1) H₂O₂ shows permanent bleaching action
   (2) Normality of 20 vol H₂O₂ is \( \frac{20}{5.6} \) N
   (3) H₂O₂ oxidises black coloured oil paintingss during their washing by H₂O₂
   (4) H₂O₂ is manufactured by electrolysis of dil H₂SO₄.

66. A gas diffuse 1/3 times as fast as hydrogen. Its molecular weight is
   (1) 9  
   (2) 18  
   (3) 3  
   (4) \( 3\sqrt{2} \)
67. Oxidation number of Nitrogen in NH₄NO₃ is
(1)+3 and +5  (2)−3 and +5
(3)+3 and −3  (4)+1 and +3

68. The energy of an electron in the 3rd orbit of a hydrogenic atom is −E. The energy of an electron in the first orbit will be−
(1) −3E  (2) −E/3
(3) −E/9  (4) −9E

69. How many bonds (bond order) does B₂ have ?
(1)0  (2)1
(3)2  (4)3

70. Which compound on electrolysis produces H₂ gas at both electrode?
(1)MgH₂ (molten)  (2)HCl (aq)
(3)NaH(molten)  (4)CaH₂(aq)

71. The enthalpy of formation of ammonia is −46.0 kJ mol⁻¹. The enthalpy change for the reaction 2NH₃(g)→2N₂(g)+3H₂(g) is
(1)46.0 kJ mol⁻¹  (2)92.0 kJ mol⁻¹
(3)−23.0 kJ mol⁻¹  (4)−92.0 kJ mol⁻¹

72. Most stable carbocation among following is–
(1)  (2)  (3)  (4)

73. The number of waves made by any electron moving in an orbit having maximum magnetic quantum number (m_l)+3 is –
(1) 3  (2) 4
(3) 5  (4) 6

74. An element having atomic number 120 have not yet been discovered. What will be its position in long form fo periodic table ?
(1)2nd group and 7th period
(2)2nd group and 8th period
(3)3rd group and 6th period
(4)3rd group and 7th period

76. NH₄NO₃ में नाइट्रोजन का आकार व से कण संख्या है –
(1)+3 एक +5  (2)−3 एक +5
(3)+3 एक −3  (4)+1 एक +3

77. किसी हाइड्रोजन प्रकाश प्रकाश में इलेक्ट्रॉडो १ " न की क्रम छोड़ होगी –
(1) −3E  (2) −E/3
(3) −E/9  (4) −9E

78. B₂ में बंब रहें जों सहजता की है?
(1)0  (2)1
(3)2  (4)3

79. ह्रजम गैसके बैनी अलाईट न द्वारा दो नाहीं, पहले कर तो मु कह तो है।
(1)MgH₂ (गैसीय)  (2)HCl (जली जय)
(3)NaH (गैसीय)  (4)CaH₂(जली जय)

80. अम्ल नित्रय की संभवबन आवश्यकता के लिए क्या हो सकता है?
2NH₃(g)→2N₂(g)+3H₂(g)
(1)46.0 kJ mol⁻¹  (2)92.0 kJ mol⁻¹
(3)−23.0 kJ mol⁻¹  (4)−92.0 kJ mol⁻¹

81. निम्न में से सबसे राशि उत्तम व ना या है?
(1)  (2)  (3)  (4)

82. एक के या यस की मात्र हुआ इलेक्ट्रॉडो १ " में उसकी लांग गांव के अन्त का पूरा कर्ता वांट में आया भोजन मा न
(1) 3  (2) 4
(3) 5  (4) 6

83. 120 फ्योटो के, क्रम बढ़ा लें एक अन्ततः तक कबी दूर धारा का आवरण में फिंहा तिक्का हो गई?
(1)2nd सूरा ह तथा आवरण
(2)2nd सूरा ह तथा आवरण
(3)3rd सूरा ह तथा आवरण
(4)3rd सूरा ह तथा आवरण
75. Correct order of solubility is
   (1) LiHCO₃ < NaHCO₃ < KHCO₃
   (2) MgSO₄ < CaSO₄ < BaSO₄
   (3) NaCl < KCl < RbCl
   (4) Be(OH)₂ > Mg(OH)₂ > Ca(OH)₂

76. For the spontaneity of reaction, which statement is always true?
   (1) ΔG = +ve: ΔH = +ve:
   (2) ΔH = +ve: ΔS = –ve:
   (3) ΔH = –ve: ΔS = –ve:
   (4) ΔH = –ve: ΔS = +ve:

77. CH₃CH₂CH₂Br + 2KOH → A + CH₃CH₂CH₂Br
   B is–
   (1) CH₃–C–CH₂
       OH D
   (2) CH₃–CH–CH₃
       OD
   (3) CH₃–CH–CH₂
       D OH
   (4) CH₃–CH₂–CH₂
       OD

78. The portion of orbital diagrams representing the electronic configuration of certain elements shown below. Which of them violet Pauli’s Exclusion principle?

   (A) 1 1 ↑
   (B) 1 1 ↓
   (C) 1 1 1
   (D) 1 1 1 1

   (1) Only A  (2) Only C
   (3) B and D  (4) A, B and D
79. Consider the following statements:
   (a) \( \text{CH}_2 = \text{CH} \rightarrow \text{CH}_2 \) is more stable than \( \text{CH}_3 \rightarrow \text{CH} - \text{CH}_3 \)
   (b) \( \text{CH}_3 \) has two types of C–C bonds.
   (c) \( \text{NH}_3 \) and \( \text{NH}_3 \) both are permissible resonating structures.
   (d) \( \text{NH}_3 \) is less stable than \( \text{NH}_3 \)

Correct statements are—
(1) a and b
(2) a, b and c
(3) a, b and d
(4) a, b, c and d

80. Which of the following is insoluble in excess of NaOH?
   (1) \( \text{Be(OH)}_2 \) (2) \( \text{AlCl}_3 \) (3) \( \text{FeCl}_3 \) (4) \( \text{ZnCl}_2 \)

81. The enthalpy changes at 298 K in successive breaking of O–H bonds of \( \text{H}_2\text{O} \) are—
   \( \text{H}_2\text{O} \rightarrow \text{H(g)} + \text{OH (g)}, \Delta H = 498 \text{ kJ mol}^{-1} \)
   \( \text{OH (g)} \rightarrow \text{H(g)} + \text{O (g)}, \Delta H = 428 \text{ kJ mol}^{-1} \)
The bond enthalpy of the O–H bond is—
(1) 498 kJ mol\(^{-1}\) (2) 463 kJ mol\(^{-1}\) (3) 428 kJ mol\(^{-1}\) (4) 70 kJ mol\(^{-1}\)

82. 2-Butyne react with Na in liquid Ammonia to form—
   (1) 1-butene (2) cis-2-butene (3) trans-2-butene (4) n-butane

83. Which electron affinity process would liberate the most energy?
   (1) \[ \text{He} \rightarrow 2s^2 + e^- \rightarrow [\text{He}] 2s^2 2p^1 \]
   (2) \[ \text{He} \rightarrow 2s^2 2p^2 + e^- \rightarrow [\text{He}] 2s^2 2p^3 \]
   (3) \[ \text{He} \rightarrow 2s^2 2p^3 + e^- \rightarrow [\text{He}] 2s^2 2p^4 \]
   (4) \[ \text{He} \rightarrow 2s^2 2p^4 + e^- \rightarrow [\text{He}] 2s 2p^5 3s^1 \]

84. Which of the following is most acidic?
   (1) \( \text{OH} \) (2) \( \text{CH}_3\text{COOH} \)
   (3) \( \text{HCOOH} \) (4) \( \text{CCl}_3\text{COOH} \)
85. Consider following statements
(a) R₂SiO is repeating unit of linear silicones
(b) R SiCl₃ on hydrolysis followed by dehydration gives linear silicones
(c) Silicones can be used as heat insulator
(d) Silica is soluble in HF
The correct statement(s) is/are
(1) a, b, c and d (2) a, c and d
(3) a, b and d (4) a and c

86. 1 mole of H₂SO₄ is mixed with 2 moles of NaOH. The heat evolved will be
(1) 57.3 kJ (2) 2 x 57.3 kJ
(3) 57.3/2 kJ (4) cannot be predicted

87. Correct order of nucleophilicity –
(1) 3 > 2 > 3 > 3
(2) 3 > 2 > 3 > 3
(3) 2 > 3 > 3 > 3
(4) 3 > 3 > 2 > 3

88. From the ground state electronic configuration of the elements given below, pick up the one with highest value of second ionisation energy.
(1) 1s²2s²2p⁶3s² (2) 1s²2s²2p⁶3s¹
(3) 1s²2p⁶ (4) 1s²2s²2p⁵

89. Which compound on reductive ozonolysis produces at least one mole of CO₂?
(1) CH₃–CH=CH–CH=CH–C₆H₅
(2)
(3) CH₂ = C=CH₂
(4) CH₂CH=CH(CH₃)₂

90. Correct Lewis acidity order of BX₃ is–
(1) BF₃ < BCl₃ < BBr₃ < BI₃
(2) BF₃ > BCl₃ > BBr₃ > BI₃
(3) BCl₃ < BBr₃ < BI₃ < BF₃
(4) BF₃ < BI₃ < BBr₃ < BCl₃

90. BX₃ की क्रम कौन से अधिक भूमिका है?
(1) BF₃ < BCl₃ < BBr₃ < BI₃
(2) BF₃ > BCl₃ > BBr₃ > BI₃
(3) BCl₃ < BBr₃ < BI₃ < BF₃
(4) BF₃ < BI₃ < BBr₃ < BCl₃
91. In which of the following plants, cells of root have maximum osmotic pressure?
   (1) Rhizophora  (2) Hydrilla  (3) Wheat  (4) Mango

92. A special membranous structure mesosome formed by the extension of plasma membrane in gram positive bacteria is concerned with all except–
   (1) DNA replication  (2) Help in respiration  (3) Help in cell wall formation  (4) Contain photosynthetic pigment

93. Bacteria show ______ behaviour due to the presence of ______ metabolic diversity
   (1) Complex, extensive  (2) Simple, less extensive  (3) Complex, less extensive  (4) Simple, extensive

94. How many of the following possess hypogynous flowers – Rose, Plum, Peach, Mustard, Brinjal, China Rose, Guava, Apple and Cucumber.
   (1) 2  (2) 3  (3) 4  (4) 5

95. Phloem parenchyma is absent in
   (1) Dicot stem  (2) Dicot root  (3) Monocot stem  (4) Monocot root

96. Which of the following larvae after metamorphosis migrate from river to ocean?
   (1) Ammocoete larvae of lampreys (cyclostoma)  (2) Trochophore larvae of molluscs  (3) Ascidian tadpole larva of *Herdmania*  (4) Dipleura larva

97. In cockroach, the body inspite of being covered by an exoskeleton of strong chitinous cuticle remains flexible due to–
   (1) Tergites  (2) Sternites  (3) Pleurites  (4) Arthrodial membranes

98. The body temperature of the following animals is ______
   (1) Squirrel  (2) Hamster  (3) Rabbit  (4) Bull

99. Which of the following are common to both seed plants and non-seed plants?
   (1) Roots  (2) Stems  (3) Leaves  (4) Flowers

100. In which of the following cases, the embryo is retained in the mother's body?
    (1) Seedless ferns  (2) Angiosperms  (3) Gymnosperms  (4) Gymnosperms

101. The number of pollinators important in the reproductive process of flowers is
    (1) 2  (2) 3  (3) 4  (4) 5

102. The enzyme responsible for the conversion of glucose to pyruvate is
    (1) Amylase  (2) Lipase  (3) Lactase  (4) Hexokinase

103. The number of chloroplasts in the cells of root is
    (1) 2  (2) 3  (3) 4  (4) 5

104. The process by which a cell always maintains a constant internal environment is
    (1) The process of osmosis  (2) The process of respiration  (3) The process of photosynthesis  (4) The process of diffusion

105. The function of mitochondria is
    (1) Synthesis of proteins  (2) Conversion of pyruvate to lactate  (3) Production of ATP  (4) Conversion of pyruvate to acetate

106. The primary tissue in the root is
    (1) Phloem  (2) Xylem  (3) Parenchyma  (4) Vascular cambium

107. The number of mitochondria in the cells of root is
    (1) 2  (2) 3  (3) 4  (4) 5

108. The process by which a cell changes its shape or size is
    (1) Cell division  (2) Cell elongation  (3) Cell differentiation  (4) Cell growth
98. Study the reaction given below

\[ \text{CO}_2 + \text{H}_2\text{O} \xrightarrow{\text{Enzyme}} \text{H}_2\text{CO}_3 \]

In absence of any enzyme this reaction is very slow, with 200 molecules of \( \text{H}_2\text{CO}_3 \) formed in an hour. In presence of enzyme the reaction speeds dramatically with about 600,000 molecule formed very second. Name the enzyme which has accelerated the reaction by 10 million times.

1. Ribozyme
2. Carbonic anhydrase
3. Catalase
4. Peroxidase

99. Mark the cranial nerves involved in communicating the sense of taste

1. Facial and glossopharyngeal
2. Abduens
3. Oculomotor
4. Trigeminal

100. Find out the incorrect statement–

1. Transport of water across endodermis always occur through symplast
2. For maximum water transport in plants root pressure is meaning less
3. Guttation occurs due to root pressure
4. \( \text{CO}_2 \) has no effect on opening and closing of stomata

101. Polysome is–

1. rRNA + Protein
2. mRNA + tRNA
3. mRNA + Protein
4. mRNA + Ribosome

102. Select the set of correct statements out of the four (a–d) given below

(a) In majority of higher animals and plants, growth and reproduction are mutually exclusive events
(b) Non-living object is capable of reproducing or replicating by itself
(c) The basics of taxonomy like identification, naming and classification of organisms are universally evolved under international codes
(d) ‘Dicots’ and ‘Mango’ represent taxa of same category.

1. (b) and (d)
2. (a) and (c)
3. (a) and (d)
4. (c) and (d)
103. How many of the following list of organisms lacks cellulosic cell wall
Diatoms, Cyanobacteria, Chlorella, Chlamydomonas, Spirogyra, Nostoc, Anabaena, Archaea, Eubacteria, Dinoflagellates, Gonyaulax, Spores of Slime moulds,
(1) 5 (2) 4 (3) 6 (4) 10

104. In respiration :-
(1) 2 PGAL are formed in glycolysis and none in kreb's cycle
(2) 6 PGAL in glycolysis, 3 PGAL in Kreb's cycle
(3) 8 PGAL in glycolysis, 3 PGAL in Kreb's cycle
(4) PGAL formation does not occur in respiration

105. Gymnosperms are also called soft wood spermaphytes because they lack
(1) Thick walled trachieds
(2) Xylem fibres
(3) Cambium
(4) Phloem fibres

106. Crocodile, fish and frog, on one hand and squirrel and crows on the other differ in the following–
(1) The former have four appendages, the latter have only two
(2) The body temperature of the former changes with environmental temperature, the temperature of the latter remains more or less constant
(3) The former undergo metamorphosis, the latter do not
(4) The former are viviparous the latter are viviparous

107. Lateral oesophageal hearts in earthworm connect–
(1) Supra-oesophageal and dorsal vessel to ventral vessel
(2) Dorsal vessel to sub-oesophageal vessel to subneural vessel
(3) Lateral oesophageal vessel to subneural vessel
(4) Dorsal vessel to subneural vessel
108. Which of the following organs, other than kidneys, also help in the elimination of excretory wastes?

- a – Lungs
- b – Liver
- c – Skin
- d – Sebaceous glands

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

109. Wharton’s duct is associated with

- (1) Brunner’s gland
- (2) Sublingual salivary gland
- (3) Submaxillary salivary gland
- (4) Parotid salivary gland

110. Match the following minerals given in column-I with their role in column II

<table>
<thead>
<tr>
<th>Column-I</th>
<th>Column-II</th>
</tr>
</thead>
<tbody>
<tr>
<td>(A)</td>
<td>B</td>
</tr>
<tr>
<td>(B)</td>
<td>Ca&lt;sup&gt;2+&lt;/sup&gt;</td>
</tr>
<tr>
<td>(C)</td>
<td>Zn&lt;sup&gt;2+&lt;/sup&gt;</td>
</tr>
<tr>
<td>(D)</td>
<td>Cl&lt;sup&gt;-&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

- A, B, C
- D

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

111. A diagrametic view of cell cycle represents the events occuring in cycle. Identify A, B, C and D. Select the correct option

- G<sub>0</sub>
- G<sub>1</sub>
- S
- G<sub>2</sub>

A B C D
(1) G<sub>0</sub> G<sub>1</sub> S G<sub>2</sub>
(2) G<sub>1</sub> G<sub>0</sub> S G<sub>2</sub>
(3) S G<sub>0</sub> G<sub>1</sub> G<sub>2</sub>
(4) G<sub>1</sub> S G<sub>2</sub> G<sub>0</sub>
112. Biological organisation level of living being can be represented as
(1) Sub-cellular → Cellular → Individual → Population
(2) Atomic → Molecular → Cellular → Tissue → Organ → Organ systems → Individual
(3) Organ → System → Tissue → Cellular → Molecular → Atomic
(4) Individual → Molecular → Tissue → Organ system → Population

113. Which one of the following statements about bryophytes is true?
(1) Flowering plants are an example of a bryophyte.
(2) Bryophytes are believed to be the most recently evolved type of plant.
(3) The diploid generation of bryophytes is unicellular.
(4) Bryophytes exhibit the reproductive process referred to as alternation of generations.

114. Triose phosphates produced in the following diagram are :-
(1) 3-PGA & 2-PGA  (2) 3-PGAL & 3-PGA
(3) 3-PGAL & DiHAP  (4) 3-PGA & DiHAP

115. Consider following structures–
Complimentary cells, Secondary cortex, Phellem, Phelloderm, Secondary medullary rays, Cork cambium, Vascular cambium of roots
How many of the above structures are product of redifferentiation
(1) 2  (2) 3  (3) 4  (4) 5

116. Which of the following statement is incorrect about birds?
(1) The two clavicles and one interclavicle forms a 'V'-shaped bone called as furcula
(2) The eyes of birds are peculiar due to the presence of pecten
(3) Carinatae or flying birds have sternum with keel
(4) In birds the left ovary and oviduct is atrophied

112. खास बों से संबंधित तरंग विकसन गठन के रूप में जियो क्रम हो गए हैं।
(1) Sub-cellular → Cellular → Individual → Population
(2) Atomic → Molecular → Cellular → Tissue → Organ → Organ systems → Individual
(3) Organ → System → Tissue → Cellular → Molecular → Atomic
(4) Individual → Molecular → Tissue → Organ system → Population

113. निम्न तम्बोले से की नथ का ब्रां या स्फीट के लिये
(1) वुर्थन यद् दप्‌त्र्का का रक्षा का या फाइट है।
(2) ब्रां या फाइट खाना धू प्रकाशित दप्‌त्र्का है।
(3) ब्रां या फाइट की हियुर धू प्रकाशित दप्‌त्र्का है।
(4) ब्रां या फाइट ही ज्ञानक्रं क्रिया पैदा है तथा कहना है।

114. निम्न चित्र में कैसे टू अ या जलीस फॉटोट टू जन

(1) 3-PGA & 2-PGA  (2) 3-PGAL & 3-PGA
(3) 3-PGAL & DiHAP  (4) 3-PGA & DiHAP

115. निम्न तक्ष तम्बोले से की नथ का या वस्त्र या गुर्जन धू दिन उ तरंग का रक्षा का या फाइट है।
(1) वुर्थन यद् दप्‌त्र्का का रक्षा का या फाइट है।
(2) ब्रां या फाइट की हियुर धू प्रकाशित दप्‌त्र्का है।
(3) ब्रां या फाइट ही ज्ञानक्रं क्रिया पैदा है।
(4) ब्रां या फाइट है।

116. निम्न तम्बोले से की नथ का पंख का ख़ाली बों के बारे में
(1) इवैं दैं दैं विश स्थं फाइट स्थं बिंबौल से की अर्थ है।
(2) पृष्ठ दैं धू दफ्तर्का की राहु पंखा के के ने त्रिकोण होते है।
(3) कैसे नियंत्रण अ उ डा न पंखा उ दो रिया की लक्ष्य तथा कहाँ है।
(4) पंखा के में ज्ञान अथ अथ डा वा हिनी की जियो क्रम हो गए हैं।
117. 98% of living organism is formed of six
  elements - carbon, hydrogen, nitrogen, oxygen
  and–
  (1) S & Mg  (2)Mg & Na
  (3) Ca & P  (4)P & S

118. Counter current mechanism helps in
  concentrating urine in animals and mainly
  operates on
  a – Henle’s loop  b – Vasa-recta
  c – PCT  d – DCT
  (1)a only  (2)b only
  (3)a and b  (4)All of these

119. Which of the following statement is incorrect
  w.r.t. histology of alimentary canal?
  (1)Serosa is the outermost layer which is made
    up of a thin mesothelium with some
    connective tissue
  (2)Muscularis is formed by smooth muscles
    usually arranged into an inner longitudinal
    layer and outer circular layer
  (3)Submucosal layer is formed of loose
    connective tissue
  (4)An oblique muscle layer may be present in
    stomach

120. Which elements are essential for functioning of
  enzymes alcohol dehydrogenase and
  phosphoenol pyruvate carboxylase?
  (1) Mg²⁺ & Zn²⁺ respectively
  (2) Mg²⁺ & K⁺ respectively
  (3) Zn²⁺ & Mg²⁺ respectively
  (4) Mo & Zn²⁺ respectively

121. Read the following statements and select the
  correct option–
  (i) M-phase represent the phase when the
      actual cell division or mitosis occurs
  (ii)Interphase represents the phase between two
      successive M-phase
  (iii) In the 24 hrs average duration of cell cycle
      of a human cell, cell division, occur last for
      only about an hour
  (iv) The M-phase last more than 95% of the
      duration of cell cycle
  (1)(i), (ii), (iii)  (2)(ii) and (iv)
  (3)(i), (iii), (iv)  (4)(i) and (iv)
122. Refer to the diagram above. Which is not shown?
   (1) a bacteriophage  (2) a bacterium
   (3) a eukaryote  (4) a virus

123. Which one of the following terms is correctly matched with their correct description?

<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Taxon</td>
<td>Provide the index to the plant species found in a particular area.</td>
</tr>
<tr>
<td>(2) Flora</td>
<td>Contains the actual account of habitat and distribution of plants of a given area.</td>
</tr>
<tr>
<td>(3) Monographs</td>
<td>Collection of preserved plants and animals.</td>
</tr>
<tr>
<td>(4) Catalogues</td>
<td>Contain information on any one taxon</td>
</tr>
</tbody>
</table>

124. Which of the following statements is not true?
   (1) Growth is measurable
   (2) Growth occurs due to catabolic activities
   (3) Growth includes plasmatic growth as well as cell divisions
   (4) Meristematic tissues are responsible for growth in plants

125. Sponges in which the cells are loosely aggregated and do not form tissues or organs are grouped under which sub-kingdom?
   (1) Metazoa  (2) Eumetazoa
   (3) Parazoa  (4) Bilateria

126. Prototherian is a group of animals which includes—
   (1) Fishes with single gill aperture
   (2) Insects with a single pair of spiracles
   (3) Mammals with a single cloaca
   (4) Protozoa with a single flagellum
127. Which of the following is a secondary metabolite as well as a drug?
(1) Concanavalin A   (2) Vinblastin
(3) Diterpense   (4) Ricin

128. Which of the following protein exhibit ATPase activity?
(1) Actin   (2) Myosin
(3) Troponin   (4) Tropomyosin

129. Which of the following is not a component of saliva?
(1) Saliva contains electrolytes Na⁺, K⁺, Cl⁻ and HCO₃⁻ ions.
(2) Ptylalin/ α-salivary amylase
(3) Mucin, lysozyme and thiocyanate ions
(4) Antibodies IgG.

130. In plants nitrogen is mainly transported as amides because–
(1) They have more nitrogen than amino acids
(2) They have less nitrogen than amino acids
(3) They are transported through xylem sap
(4) They can be synthesized without any enzyme

131. Which of the following statement is incorrect regarding metaphase–
(1) Spindle fibres attach to kinetochores of chromosomes
(2) Chromosomes are moved to spindle equator and get aligned along metaphase plate through spindle fibres to both poles
(3) At this stage, metaphase chromosome is made up of two non-sister chromatids which are join together by centromere
(4) The complete disintegration of nuclear membrane marks to start of the second phase of mitosis

132. Even though the two domains are procaryotic, the Archaea domain differs from the Bacteria domain in that the Archaea
I. lack muramic acid in their cell walls.
II. posses membrane lipids with ether-linked branched aliphatic chains.
(1) Only I is true
(2) Only II is true
(3) Both I and II are true
(4) Neither I nor II true
133. Which of the following pairs are correctly matched?
(a) Thorns – Citrus
(b) Green stem – Opuntia
(c) Stem tendrils – Climbing Pea
(d) Underground stem – Colocasia
(1) (b), (c) and (d) (2) (a), (b) and (d) (3) (a), (c) and (d) (4) (a), (b) and (c)

134. In the following diagram which leaf show more absolute growth?

135. Blind sac body plan is found in–
(1) Sponges (2) Annelids (3) Coelenterates (4) Round worms

136. Blisters are produced on the body due to infection of worm called–
(1) Trichinella (2) Dracunculus (3) Wuchereria (4) Echinococcus

137. Which of the following is mismatched?
(1) Chitin – Polymer of glucosamine
(2) Glycogen – Polymer of glucose
(3) Cellulose – Heteropolysaccharide
(4) Inulin – Homopolysaccharide

138. One of the following ions is essential for muscular contraction
(1) Na⁺, Ca²⁺ (2) Mg²⁺, Ca²⁺ (3) Mg²⁺, K⁺ (4) K⁺, Na⁺

139. What is the partial pressure of oxygen and carbon dioxide in atmospheric air?
(1) pO₂ 159 mm Hg, pCO₂ 0.3 mm Hg
(2) pO₂ 104 mm Hg, pCO₂ 40 mm Hg
(3) pO₂ 40 mm Hg, pCO₂ 45 mm Hg
(4) pO₂ 95 mm Hg, pCO₂ 40 mm Hg

133. निम्नलिखित से कौन से सूट में सुंदर माना गया है?
(a) ठोंसे नींद – सिंदूर सा
(b) हरे लाल – अंदे पीने व चा बना
(c) तीन सा प्राण तन – अंदे हो गए मटर
dु वे ले के लिये
(1) (b), (c) और (d) (2) (a), (b) और (d) (3) (a), (c) और (d) (4) (a), (b) और (c)

134. निम्नलिखित से कौन नस्ल और उनके का विवेक पृथ्वी का है?

135. निम्नलिखित से किसी एक वायु के अथवा वायु जब-जब जब?
(1) पेंजु (2) पीली लिस्ट
(3) में लेंटेंट से (4) गाये लक्कर

136. निम्नलिखित से जिसका प्रति संदर्भ से रूप राखे जाते है?
(1) अंजिने लहंगे (2) छुए खूने लहंगे (3) बिखे निकू लश (4) इंक दो बिखे के कश

137. निम्नलिखित से मिला न होगा?
(1) लाल इंटो न – गन्नों के रूप में बना या बना लक्कर
(2) लाल इंटो जा – गन्नों के रूप में बना लक्कर
(3) में लेंटेंट से (4) भिंडे निकू लश के बीड
(5) इंक दो बिखे के (6) सबसे लिस्ट के बीड

138. पेंजु से संबंध बंधे वियों के लिये अलग अलग या होते है?
(1) Na⁺, Ca²⁺ (2) Mg²⁺, Ca²⁺ (3) Mg²⁺, K⁺ (4) K⁺, Na⁺

139. वायु मात्र लेकर अंदे में से ज्ञात किया जाता नहीं है?
(1) pO₂ 159 mm Hg, pCO₂ 0.3 mm Hg
(2) pO₂ 104 mm Hg, pCO₂ 40 mm Hg
(3) pO₂ 40 mm Hg, pCO₂ 45 mm Hg
(4) pO₂ 95 mm Hg, pCO₂ 40 mm Hg
140. C₄ plants do not show photorespiration because—
(1) They have a mechanism that increase the CO₂ concentration at RuBisCO
(2) RuBisCO is present in mesophyll cells
(3) At high light intensities C₄ plants show an increase in the rate of photosynthesis
(4) Current availability of CO₂ level is limiting to the C₃ plants

141. An action spectrum defines the relative effectiveness of different wavelengths of light for light-dependent processes. Who in 1882 revealed for the first time the action spectrum of photosynthesis in a filamentous alga?
(1) Calvin
(2) Hatch and Slack
(3) Engelman
(4) T W Arnon

142. Of the following types of organisms, which do not have a membrane surrounding their chromosome?
(a) Archaebacteria (b) Eubacteria (c) Fungi (d) Protozoa
(1) a, c, d, e (2) a, b, c (3) a, b, d (4) a, b, e

143. Choose the correct description depicted by the following floral diagram

(1) United valvate sepals, free twisted petals, free stamens, bilocular ovary with marginal placentation
(2) Free valvate sepals, free imbricate petals, free stamens, unilocular ovary with axile placentation
(3) Two whors of sepals, free petals, stamens in two whors, bilocular ovary with axile placentation
(4) Two whors of sepals, free petals, stamens in two whors, bilocular ovary with parietal placentation

144. Cartwheel structure of tubulin are seen in
(1) Basal body of cilia
(2) Centriole
(3) Both (1) and (2)
(4) Shaft of cilia and flagella
145. Animals which are triploblastic with tube within tube type of body plan and embryonic blastopore forms anus (deuterostomia) are—
(1) Annelids (2) Molluscs (3) Platyhelminthes (4) Echinoderms

146. Ciliated epithelium occurs in—
(1) Trachea and lungs (2) Trachea and liver (3) Bronchioles and fallopian tubes (4) Bronchioles and lungs

147. Which of the following is incorrect matching of an amino acid its functions?

<table>
<thead>
<tr>
<th>Amino Acid</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Tyrosine</td>
<td>Forms hormones (thyroxine and adrenaline)</td>
</tr>
<tr>
<td>(2) Tyrosine</td>
<td>Simplest and optically inactive amino acid</td>
</tr>
<tr>
<td>(3) Tryptophan</td>
<td>Synthesis of I.A.A. (Plant hormone)</td>
</tr>
<tr>
<td>(4) Alanine</td>
<td>Skin pigment melanin</td>
</tr>
</tbody>
</table>

148. Which of the following statements is incorrect?
(1) Pars intermedia atrophies during foetal development
(2) Pituitary gland is lodged in sella turcica
(3) Neurohypophysis synthesizes two hormones
(4) Herring bodies are present in neurohypophysis

149. Which of the following statement is incorrect about transport of gases?
(1) About 97 percent of O₂ is transported by RBCs in the blood
(2) 3 percent of O₂ is carried in dissolved state through the plasma
(3) 20-25 percent of CO₂ is transported by RBCs
(4) 70 percent carbon dioxide is carried in dissolved state in plasma

150. In photosynthesis—
(1) 3 PGA is not formed
(2) Sugar is synthesised
(3) ATP is used
(4) ATP is synthesized

145. वे जाति के विशाल स्रोत शराब रूप जाने के अंतर्गत नतीज़ का रूप बदलते हैं, यदि कुछ दूसरे घटक। यदि कुछ दूसरे घटक है तो निम्नलिखित प्रमाणन है?
(1) ऐल्लू लिंक (2) मल्हूसल (3) प्लाटेलिंक (4) इचनोडेयर्म्स

146. ये माहि-उ फल्ता किसी पेड़ को जाते हैं?
(1) खड़ा लाल फूल फूड़ (2) खड़ा लाल कुट (3) सरस्नात्क ये (4) फूड़ फूड़

147. आमी नाग अलवं इनके का ये के मंगलमिल मे कै से निर्माण है?

<table>
<thead>
<tr>
<th>अमी नाग</th>
<th>अनल</th>
<th>कै से</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) टी. इसे सिं</td>
<td>शादी के भी बाँटने को लेकर</td>
<td></td>
</tr>
<tr>
<td>(2) र लाइडा</td>
<td>स्वदेशी वा या वा या अनुमति</td>
<td></td>
</tr>
<tr>
<td>(3) हूं पट्टा (प.)</td>
<td>या या या फूड़</td>
<td></td>
</tr>
<tr>
<td>(4) हूं निम्न</td>
<td>तंदुरा वर्ध के ले निम्न</td>
<td></td>
</tr>
</tbody>
</table>

148. निम्न मे से कौन सा निर्देश नहीं है?
(1) विहार सात के हूं या अस्त्र के दौ र न चाहे सर्कश फूड़ 31 च |
| 2 | (2) ये यु स्व या किसी सेल टेस्ट का मे हिस्सा ताही ले हो |
| 3 | (3) यू रे या फर इस्फाय द के हां स्वाद ना संगी जन |
| 4 | (4) यू रे फर इस्फाय द निम्न लाई या जिन्ही ती हो |

149. ये चं ने के पर्वत के लिए कौन सा निर्देश?
(1) खं तमों रंग के हआ र चम चार जिन्द 37 का पर्वत हां ती हो |
| 2 | (2) फर तमा के हआ र चम चार जिन्द 37 का पर्वत हां ती हो |
| 3 | (3) में रंग 20-25 का जज 2 का पर्वत हां ती हो |
| 4 | (4) फर तमा का जज तमा र जनश द अंस अस्त्र 27 मे हां ती हो |

150. अव व रंग खाने मे—
(1) 3 PGA नाहीं बनत हैं |
| 2 | (2) य र बं संगी जन | न नहीं हो ती हो |
| 3 | (3) ATP प्रयु क तांबे ली हो |
| 4 | (4) ATP संगी जज तांबे ली हो
151. C₄ plants are different from C₃ plants with respect to the–
(1) Types of end-products of photosynthesis
(2) Types of pigments involved in photosynthesis
(3) Presence of PEP case enzyme
(4) Substrate that accepts atmospheric CO₂ in carbon assimilation

152. Diatoms are characterized by all except which of the following?
(1) Overlapping shells
(2) Classification as chrysophytes
(3) Silica composition
(4) Flagella

153. What is asked in the given below diagram?
(1) Aleurone layer (2) Embryo (3) Placenta (4) Coleoptile

154. What is true about heart wood?
(a) It does not help in water conduction
(b) It is also called alburnum
(c) It is dark in colour but very soft
(d) Absence of vessels and parenchyma
(1) b, c, and d (2) a and d (3) b and d (4) a, b, and c

155. A deuterostomic animal is–
(1) Star fish (2) Sea Anemone (3) Pearl oyster (4) Octopus

156. Fat is abundant in–
(1) Liver cells (2) Alveolar tissue (3) Adipose tissue (4) Lymph glands

157. Tick mark the false statement–
(1) Artificial silk is polysaccharide
(2) Natural silk is a protein
(3) Collagen protein forms intercellular ground substance
(4) α-helix are tertiary level proteins structure.
158. Hormonal action initiates an expanding cascade of response. It is known as ________.
(1) Amplification (2) Synergistic effect (3) Antagonistic effect (4) Positive feedback

159. High blood pressure can potentially harm the vital organs like–
(A) A – Heart (B) B – Brain (C) C – Kidneys (D) D – Lungs
(1) A and B only (2) B and C only (3) A, B and C (4) A, B, C and D

160. Sectional view of chloroplast which is given below choose the correct statement for A & B?
(1) Envelope of chloroplast posses fully premeable membrane
(2) "B" posses the enzyme required for protein & carbohydrate synthesis
(3) The DNA of the chloroplast are single standard circular DNA
(4) A structure is arranged is stacks like the piles of coins called stroma

161. The diagram below summarises the light-dependent reactions in photosynthesis–
What is occurring at X?
(1) ADP + Pi → ATP
(2) NADP → NADPH + H⁺
(3) 2H₂O → O₂ + 4H
(4) RuBP + CO₂ → 2GP
162. Green algae and land plants are similar in all except which of the following characteristics?

1) types and proportions of photosynthetic pigments
2) storage of carbohydrate in the form of starch
3) cell walls composed of cellulose
4) haploid dominant life cycles

163. A floral diagram is given below. It belongs to the family

![Floral Diagram]

(1) Malvaceae  (2) Solanaceae
(3) Lamiaceae  (4) Liliaceae

164. Anatomically a fairly old dicot root is distinguished from the dicot stem by

1) Presence of cortex
2) Absence of secondary xylem
3) Absence of secondary phloem
4) Position of protoxylem

165. The intestine of dogfish is characterized by the presence of

1) Scroll valve  (2) Typhlosole
(3) Maltae cross  (4) Cartilage

166. Which one of the following has alternate striations and is branched?

1) Biceps under autonomous control
2) Iris muscle under control of will
3) Heart muscle, involuntary
4) Muscle of visceral organs under autonomous control
167. Which of the following statement is incorrect?

1) Lipids are strictly macromolecules
2) Palmitic acid has 16 carbons including carboxyl carbon
3) Oils have low melting point and hence remain as oil in winters
4) Arachidonic acid is an unsaturated fatty acid

168. If the receptors are removed from post-synaptic membrane, then

1) Synaptic transmission will be faster
2) Chemical synaptic transmission will become slow
3) Chemical synaptic transmission will not occur
4) Synaptic transmission will be not affected

169. Which of the following statement is not true about blood pressure?

1) Blood pressure is measured with an instrument called sphygmomanometer
2) If the blood pressure of an individual is 140/90 mm Hg or higher, it shows hypertension
3) The normal systolic pressure is 120 mm Hg and diastolic pressure is 80 mm Hg.
4) Hypertension is caused by vasodilation which results in increased resistance to blood flow

170. Match the column

<table>
<thead>
<tr>
<th>Column I</th>
<th>Column II</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) Telocentric</td>
<td>(i) L-shaped</td>
</tr>
<tr>
<td>(b) Sub metacentric</td>
<td>(ii) i-shape</td>
</tr>
<tr>
<td>(c) Meta centric</td>
<td>(iii) j-shape</td>
</tr>
<tr>
<td>(d) Acrocentric</td>
<td>(iv) v-shape</td>
</tr>
</tbody>
</table>

1) (a)-(i), (b)-(iii), (c)-(iv), (d)-(ii)
2) (a)-(iv), (b)-(ii), (c)-(iii), (d)-(i)
3) (a)-(ii), (b)-(i), (c)-(iv), (d)-(iii)
4) (a)-(i), (b)-(iv), (c)-(iii), (d)-(i)
171. The diagram below represents the nitrogen cycle—

Which one of A to E correctly identifies the events happening at points X, Y and Z in the cycle?

<table>
<thead>
<tr>
<th></th>
<th>X</th>
<th>Y</th>
<th>Z</th>
</tr>
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<tbody>
<tr>
<td>(1)</td>
<td>Non-biological nitrogen fixation</td>
<td>Decay by microorganisms</td>
<td>Nitrification</td>
</tr>
<tr>
<td>(2)</td>
<td>Biological nitrogen fixation</td>
<td>Nitrification</td>
<td>Dentrification</td>
</tr>
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<td>Denitrification</td>
</tr>
</tbody>
</table>

172. Match the column

**Inflorescence**  
 a. Spike  
 b. Capitulum  
 c. Cyathium  
 d. Mixed spadix  
 e. Sunflower  
 f. Achyrantes

**Plant**  
 i. Grapes  
 ii. Banana  
 iii. Poinsetta  
 iv. Sunflower  
 v. Achyrantes

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

173. The cells of the Quiescent centre are characterized by

1) having light cytoplasm and small nuclei
2) having dense cytoplasm and prominent nuclei
3) dividing regularly to add to tunica
4) cell differentiation

174. The diagram below represents the nitrogen cycle—

Which one of A to E correctly identifies the events happening at points X, Y and Z in the cycle?

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

176. The cells of the Quiescent centre are characterized by

1) having light cytoplasm and small nuclei
2) having dense cytoplasm and prominent nuclei
3) dividing regularly to add to tunica
4) cell differentiation
174. The correct sequence of various larvae in liver fluke is–
(1) Miracidium, sporocyst, cercaria, redia, metacercaria
(2) Miracidium, sporocyst, redia, cercaria, metacercaria
(3) Sporocyst, redia miracidium, cercaria, metacercaria
(4) Cercaria, sporocyst, redia, miracidium, metacercaria

175. Which pair of structures distinguish a nerve cell from other cells?
(1) Vacuoles and fibres
(2) Nucleus and mitochondria
(3) Perikaryon and dendrites
(4) Flagellum and medullary sheath

176. Which of the following statement is incorrect?
(1) Backbone of DNA is formed by sugar-phosphate-sugar chain
(2) Nucleic acids are present in acid soluble fraction of any living tissue
(3) DNA and RNA function as genetic material
(4) There are three hydrogen bonds between G and C in DNA molecule

177. Which of the following is not a function of Hypothalamus?
(1) Correction of signals, controlling respiration and heart beat
(2) It sets the body temperature above the 37°C during infection
(3) It organises behaviour related to survival of species
(4) It regulates planning and execution of stereotyped movements
178. Given below is the ECG of a normal human. Which one of its components is correctly interpreted below?

(1) Peak P and Peak R together — Systolic and diastolic blood pressure
(2) Peak P — Initiation of left atrial contraction only
(3) Complex QRS — Depolarization of ventricles
(4) Peak T — Initiation of total cardiac contraction

For the next 2 questions each lists two categories, numbered I and II. Select your answer based on their relationships

179. I. Produces motile cells
II. - Rhodophyta
(1) All members of I are also members of II, but not all members of II are members of I.
(2) All members of II are also members of I, but not all members of I are members of II.
(3) All members of I are members of II, and all members of II are members of I.
(4) No member of I is member of II.

180. I. - Phaeophyta
II. - Marine algae
(1) All members of I are also members of II, but not all members of II are members of I.
(2) All members of II are also members of I, but not all members of I are members of II.
(3) All members of I are members of II, and all members of II are members of I.
(4) No member of I is also a member of II.
SPACE FOR ROUGH WORK / रफ का यं के लिए जाह