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 cannot 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.

Your Target is to secure Good Rank in Pre-Medical 2013
1. A particle is moving with constant speed \( v \) on a circular path of radius \( r \). When it has moved by angle 60°, then find average velocity:

\[ (1) \ r \quad (2) \ \frac{3v}{\pi} \quad (3) \ \frac{3v^2}{\pi r} \quad (4) \ v \]

2. In a carbon monoxide molecule the carbon and the oxygen atoms are separated by a distance \( 1.12 \times 10^{-10} \) m. The distance of the centre of mass from the carbon atom is:

\[ (1) \ 0.48 \times 10^{-10} \quad (2) \ 0.51 \times 10^{-10} \quad (3) \ 0.56 \times 10^{-10} \quad (4) \ 0.64 \times 10^{-10} \]

3. An ant is moving on the stairs as shown in the figure. There are 10 stairs and each stairs has width of 8 cm and height of 6 cm. Then find displacement of the ant:

\[ (1) \ 140 \text{ cm} \quad (2) \ 60 \text{ cm} \quad (3) \ 80 \text{ cm} \quad (4) \ 100 \text{ cm} \]

4. A solid sphere rolling on a surface has total kinetic energy given by:

\[ (1) \ \frac{1}{2} Mv^2 \quad (2) \ \frac{7}{5} Mv^2 \quad (3) \ \frac{7}{10} Mv^2 \quad (4) \ \frac{3}{10} Mv^2 \]

5. A particle starts from rest, accelerates at 2 \( m/s^2 \) for 10 sec and then goes with constant speed for 30 sec and then decelerates at 4 \( m/s^2 \) till it stops. What is the distance travelled by it?

\[ (1) \ 750 \text{ m} \quad (2) \ 50 \text{ m} \quad (3) \ 100 \text{ m} \quad (4) \ 500 \text{ m} \]
6. A massless disc of radius \( r \) is attached with 5 masses of mass \( m \) on its rim. The total moment of inertia of the system is:

(1) \( 5mr^2 \)  
(2) \( \frac{11}{2} mr^2 \)  
(3) \( \frac{1}{2} mr^2 \)  
(4) \( \frac{6}{7} mr^2 \)

7. A body projected vertically upwards, reaches a height of 180 m. Find out velocity of body at \( t = 8 \) sec:

(1) 60 m/s  
(2) Zero  
(3) 20 m/s  
(4) 10 m/s

8. If vector \( \vec{F} \) be a force acting on a particle having the position vector \( \vec{r} \) and \( \vec{\tau} \) be the torque of this force about the origin, then:

(1) \( \vec{r} \cdot 0 = \vec{F} \cdot 0 \)  
(2) \( \vec{r} \cdot 0 \neq \vec{F} \cdot 0 \)  
(3) \( \vec{r} \cdot 0 \neq 0 \)  
(4) \( \vec{r} \cdot 0 = 0 \) and \( \vec{F} \cdot 0 = 0 \)

9. A car is moving with a speed of 25 km/hr in East and car driver observes that a bus is moving with a speed of \( 25 \sqrt{3} \) km/hr in the north then find actual velocity of bus:

(1) 50 km/hr (60º N of E)  
(2) 50 km/hr (30º E of N)  
(3) 50 km/hr \( \tan^{-1} \left( \sqrt{3} \right) \) N of E  
(4) All of the above

10. The angular velocity of the body changes from \( \omega_1 \) to \( \omega_2 \) without applying torque but by changing moment of inertia. The initial radius of gyration to the final radius of gyration is:

(1) \( \frac{\omega_2}{\omega_1} \)  
(2) \( \frac{\omega_2}{\omega_1} \)  
(3) \( \sqrt{\omega_2} : \sqrt{\omega_1} \)  
(4) \( \frac{1}{\omega_2} : \frac{1}{\omega_1} \)

11. A train is moving with velocity of 36 km/hr. A boy is sitting in the train throws a ball upwards with 5 m/s. Then what will be the path of ball as seen by the boy?

(1) Parabolic  
(2) Straight line  
(3) Circular  
(4) Zig-zag
12. A smooth uniform rod of length L and mass M has two identical beads of negligible size, each of mass m, which can slide freely along the rod. Initially, the two beads are at the centre of the rod and the system is rotating with angular velocity $\omega_0$ about an axis perpendicular to rod and passing through the mid-point of rod. There are no external forces. When the beads reach the ends of the rod the angular velocity of the system is :-

(1) $\left(\frac{M}{M+3m}\right)\omega_0$  
(2) $\left(\frac{M}{M+6m}\right)\omega_0$  
(3) $\left(\frac{M+6m}{M}\right)\omega_0$  
(4) $\omega_0$

13. If $x = a \cos t$ and $y = b \sin t$, then what is the nature of trajectory of particle?

(1) Straight line  
(2) Parabolic  
(3) Elliptical  
(4) Circular

14. A particle of mass m is projected with a velocity $v$ making an angle of 45º with the horizontal. The magnitude of angular momentum of the projectile about an axis of projection when the particle is at maximum height $h$ is :-

(1) Zero  
(2) $\frac{mv^3}{4\sqrt{2}g}$  
(3) $\frac{mv^2}{\sqrt{2}g}$  
(4) $m\sqrt{2gh^3}$

15. Position vector of a particle with respect to projection point is $\mathbf{r} = 3t\mathbf{i} + (4t - 5t^2)\mathbf{j}$. Take horizontal direction on x-axis and vertical direction on y-axis. Then find out angle of projection : -

(1) 53º  
(2) 30º  
(3) 60º  
(4) Can't be determine
16. If the moment of inertia of a disc about an axis tangentially and parallel to its surface be \( I \), then the moment of inertia about the axis tangential but perpendicular to the surface will be :

- (1) \( \frac{6}{5} I \)
- (2) \( \frac{3}{4} I \)
- (3) \( \frac{3}{2} I \)
- (4) \( \frac{5}{4} I \)

17. The equation of trajectory of a projectile thrown on ground is \( 5x^2 - 2x + 2y = 0 \). Here \( x, y \) are in meter and denote the horizontal and vertical distance respectively. Point of projection is to be assume as origin. Then find out horizontal range :

- (1) 10 m
- (2) 2.5 m
- (3) 0.4 m
- (4) 5 m

18. A uniform equilateral triangular lamina of side \( \ell \) has mass \( m \). Its moment of inertia about the axis through the centroid and perpendicular to its plane of the lamina is :

- (1) \( \frac{m\ell^2}{3} \)
- (2) \( \frac{m\ell^2}{6} \)
- (3) \( \frac{m\ell^2}{12} \)
- (4) None of these

19. Determine the value of \( m \) so that \( \vec{A} = 2\hat{i} + m\hat{j} + \hat{k} \) and \( \vec{B} = 4\hat{i} - 2\hat{j} - 2\hat{k} \) are perpendicular :

- (1) 3
- (2) 6
- (3) 4
- (4) Zero

20. In a rocket, fuel burns at the rate of 1 kg/s. This fuel is ejected from the rocket with a velocity of 60 km/s. It exerts a force on the rocket equal to :

- (1) 60 N
- (2) 600 N
- (3) 6000 N
- (4) 60000 N
21. An aeroplane takes off at angle of 45º to the horizontal. If the component of its velocity along the horizontal is 250 m/s, What is its actual velocity?

(1) 250 m/s  
(2) 250\sqrt{2} m/s  
(3) 144 m/s  
(4) 125 m/s

22. A car of mass \( m \) has an engine which can deliver power \( P \). The minimum time in which the car can be accelerated from rest to a speed \( v \) is:

(1) \( \frac{mv^2}{2P} \)  
(2) \( P \frac{mv^2}{2} \)  
(3) \( 2P \frac{mv^2}{2} \)  
(4) \( \frac{mv^2}{2P} \)

23. A body travels uniformly a distance of \( (24 \pm 0.2) \) m in a time interval of \( (6 \pm 0.1) \) sec. Its velocity is given by: -

(1) \( (4 \pm 0.2) \) m/s  
(2) \( (4 \pm 0.3) \) m/s  
(3) \( (4 \pm 0.05) \) m/s  
(4) \( (4 \pm 0.1) \) m/s

24. A slab \( S \) of mass \( m \) is released from a height \( h_0 \) from the top of spring of force constant \( k \). The maximum compression \( x \) of the spring is given by the equation:

(1) \( mg \frac{h_0}{2} = \frac{1}{2} kx^2 \)  
(2) \( mg (h_0 - x) = \frac{1}{2} kx^2 \)  
(3) \( mg h_0 = \frac{1}{2} k (h_0 + x)^2 \)  
(4) \( mg (h_0 + x) = \frac{1}{2} kx^2 \)

25. The percentage errors in the measurement of length and time period of a simple pendulum are 1% and 2% respectively. Then the maximum error in the measurement of acceleration due to gravity is : -

(1) 8%  
(2) 3%  
(3) 5%  
(4) 4%
26. The potential energy of a particle in a certain field has the form, \( U = \frac{a}{r^2} - \frac{b}{r} \) where \( a \) and \( b \) are positive constants, \( r \) is the distance from the centre of the field. The distance of the particle in the stable equilibrium position is:

(1) \( \frac{a}{b} \)  
(2) \( -\frac{a}{b} \)  
(3) \( 2a/b \)  
(4) \( -2a/b \)

27. Unit of universal gas constant in S.I. units is:

(1) \( \text{Watt K}^{-1} \text{mol}^{-1} \) 
(2) \( \text{Joule K}^{-1} \text{mol}^{-1} \) 
(3) \( \text{erg K}^{-1} \text{mol}^{-1} \)  
(4) \( \text{Joule L}^{-1} \text{mol}^{-1} \)

28. Consider a car moving on a straight road with a speed of 100 m/s. The distance at which car can be stopped, is : \( [\mu_k = 0.5] \)

(1) 800 m  
(2) 1000 m  
(3) 100 m  
(4) 400 m

29. Given \( F = \frac{a}{t} + bt^2 \), where \( F \) denotes force and \( t \) time. The dimensions of \( a \) and \( b \) are respectively:

(1) \( \text{MLT}^{-1}, \text{MLT}^{-4} \)  
(2) \( \text{LT}^{-1}, \text{T}^{-2} \)  
(3) \( \text{T}, \text{T}^{-2} \)  
(4) \( \text{LT}^{-2}, \text{T}^{-2} \)

30. A player caught a cricket ball of mass 150 g moving at a rate of 20 m/s. If the catching process is completed in 0.1 s, the force of the blow exerted by the ball on the hand of the player is equal to:

(1) 150 N  
(2) 3 N  
(3) 30 N  
(4) 300 N

31. The dimensions of gravitational constant \( G \) are:

(1) \( \text{MLT}^{-2} \)  
(2) \( \text{ML}^3 \text{T}^{-2} \)  
(3) \( \text{M}^{-1} \text{L}^3 \text{T}^{-2} \)  
(4) \( \text{M}^{-1} \text{LT}^{-2} \)
32. According to the figure, a block weighing 10 N travels down a smooth curved track AB joined to a rough horizontal surface. The rough surface has a friction coefficient of 0.20 with the block. If the block starts slipping on the track from a point 1.0 m above the horizontal surface, then it would move a distance \( S \) on the rough surface. The value of \( S \) is:- \( [g = 10 \text{ ms}^{-2}] \)

\[ S = 1 \text{ m} \]

33. The area of shaded portion of the graph represents :

(1) The average acceleration
(2) The maximum kinetic energy
(3) The momentum
(4) The displacement

34. In a children's park, there is a slide which has a total length of 10 m and a height of 8 m. A vertical ladder is provided to reach the top. A boy weighing 200 N climbs up the ladder to the top of the slide and slides down to the ground. The average friction offered by the slide is three-tenth of his weight. The work done by the friction on the boy as he comes down is:-

(1) 0 J
(2) +600 J
(3) –600 J
(4) +1600 J

35. Two particles of equal masses are revolving in circular paths of radii \( r_1 \) and \( r_2 \) respectively with the same speed. The ratio of their centripetal force is:

(1) \( \frac{r_2}{r_1} \)
(2) \( \sqrt{\frac{r_2}{r_1}} \)
(3) \( \left( \frac{r_1}{r_2} \right)^2 \)
(4) \( \left( \frac{r_2}{r_1} \right)^2 \)
36. A body of mass 2 kg moves under the influence of a force. Its position x changes with time according to the relation \( x = \frac{t^3}{3} \) where x is in meter and t in second. The work done by this force in the first two second will be:

(1) 1600 J  
(2) 160 J  
(3) 16 J  
(4) 1.6 J

37. A particle moves in a circle of radius 25 cm at two revolution per sec. The acceleration of the particle in m/s² is:

(1) \( \pi \)  
(2) \( 8 \pi \)  
(3) \( 4 \pi \)  
(4) \( 2 \pi \)

38. Two masses \( m_a \) and \( m_b \) moving with velocities \( v_a \) and \( v_b \) in opposite directions collide elastically and after that \( m_a \) and \( m_b \) move with velocities \( v_b \) and \( v_a \) respectively. Then the ratio \( \frac{m_a}{m_b} \) is:

(1) \( \frac{v_a - v_b}{v_a + v_b} \)  
(2) \( \frac{m_a + m_b}{m_a} \)  
(3) 1  
(4) \( \frac{1}{2} \)

39. At a curved path of a road, the road is raised a little on the side away from the centre of the curved path, the slope of the road is given by:

(1) \( \tan \theta = \frac{Vg}{r} \)  
(2) \( \tan \theta = \frac{V^2}{rg} \)  
(3) \( \tan \theta = \frac{gr}{V^2} \)  
(4) \( \tan \theta = \frac{V^2r}{g} \)

40. A particle falls from a height 'h' upon a fixed horizontal plane and rebounds. If 'e' is the coefficient of restitution the total distance travelled before rebounding has stopped is:

(1) \( h \left( \frac{1+e^2}{1-e^2} \right) \)  
(2) \( h \left( \frac{1-e^2}{1+e^2} \right) \)  
(3) \( \frac{h}{2} \left( \frac{1-e^2}{1+e^2} \right) \)  
(4) \( \frac{h}{2} \left( \frac{1+e^2}{1-e^2} \right) \)
41. For a particle in uniform circular motion, the acceleration \( \mathbf{\ddot{a}} \) at a point \( P(R, Q) \) on the circle of radius \( R \) is:

(Here \( Q \) is measured from x-axis)

1. \( \frac{V^2}{R} \mathbf{i} + \frac{V^2}{R} \mathbf{j} \)
2. \(-\frac{V^2}{R} \cos \theta \mathbf{i} + \frac{V^2}{R} \sin \theta \mathbf{j}\)
3. \(-\frac{V^2}{R} \sin \theta \mathbf{i} + \frac{V^2}{R} \cos \theta \mathbf{j}\)
4. \(-\frac{V^2}{R} \cos \theta \mathbf{i} - \frac{V^2}{R} \sin \theta \mathbf{j}\)

42. A spring balance is attached to the ceiling of a lift. A man hangs his bag on the spring and the spring reads 49N, when the lift is stationary. If the lift moves downward with an acceleration of 5 m/s^2, the reading of the spring balance will be:

1. 24 N
2. 74 N
3. 15 N
4. 49 N

43. If position vector varies with time as \( \mathbf{r} = (\sin t \mathbf{i} + \cos t \mathbf{j} + tk) \) m, where \( t \) is in seconds. Find speed at \( t = \frac{\pi}{2} \) sec:

1. \( \sqrt{2} \) m/s
2. 2 m/s
3. Zero
4. 10 m/s

44. Percentage increase in K.E. of a particle is 300%. Then percentage increase in its linear momentum will be:

1. 100%
2. 150%
3. 300%
4. 50%

45. A force \( \mathbf{F} = -k(\mathbf{x} \mathbf{i} + \mathbf{y} \mathbf{j}) \) (where \( k \) is a positive constant) acts on a particle moving in the xy-plane. Starting from the origin, the particle is taken along the positive x-axis to the point \( (a, 0) \) and then parallel to y-axis to the point \( (a, a) \). The total work done by the force \( \mathbf{F} \) on the particle is:

1. \(-2ka^2\)
2. \(2ka^2\)
3. \(-ka^2\)
4. \(ka^2\)
46. Density of a gas is found to be 5.46 g/L at 27°C at 2 bar pressure. What will be its density at STP? 
(1) 3 g/L (2) 1.5 g/L (3) 6 g/L (4) 4.5 g/L

47. For the change:
\[H_2O (S, 273 K, 2 atm) \rightarrow H_2O (\ell, 273 K, 2 atm)\]
Choose the correct option:
(1) \( \Delta G = 0 \) (2) \( \Delta G < 0 \) (3) \( \Delta G > 0 \) (4) None

48. The densities of two gases are in the ratio of 1:16. The ratio of their rates of diffusion is ?
(1) 16:1 (2) 4:1 (3) 14 (4) 1:16

49. The heat of atomization of \( P_4 \) is 228 Kcal/mol and That of \( P_2 \) is 355 Kcal/mol. The energy of P-P bond is:
(1) 102 Kcal/mol (2) 26 Kcal/mol (3) 51 Kcal/mol (4) 204 Kcal/mol

50. The compressibility factor of an ideal gas is?
(1) 0 (2) 1 (3) 2 (4) \( \infty \)

51. For which of the following reactions enthalpy change represents enthalpy of formation of NaOH:
(1) \( Na^+_{aq} + OH^-_{aq} \rightarrow NaOH_{(s)} \) 
(2) \( Na_{(s)} + \frac{1}{2} O_{2(g)} + \frac{1}{2} H_{2(g)} \rightarrow NaOH_{(s)} \) 
(3) \( 2Na_{(s)} + 2H_2O_{(l)} \rightarrow 2NaOH_{aq} + H_2(g) \) 
(4) All of above

52. The pH of 10^{-8} M HClO_{4} solution is:-
(1) 8 (2) 6 (3) between 6 & 7 (4) between 7 & 8

53. Which of the following is correct for spontaneity:-
(1) \( \Delta G^o < 0 \) (2) \( \Delta S < 0 \) (3) \( \Delta S > 0 \) (4) \( \Delta G > 0 \)

54. The freezing point of a solution containing 4.8 g of a compound in 60 g benzene is 4.5°C. The molar mass of the compound is -
\( (K_f = 5.1 \text{ km}^{-1} \text{C}, \text{freezing point of } C_6H_6 \text{ is } 5.5°C)\)
(1) 100 (2) 40 (3) 200 (4) 400

46. 27°C, 2 bar दर पर, एक घंटे में तापमान 7.64 g/L पर उग्र होगा।
(1) 3 g/L (2) 1.5 g/L (3) 6 g/L (4) 4.5 g/L

47. निम्नलिखित नतीजतनों के लिए यह है:
\[H_2O (S, 273 K, 2 atm) \rightarrow H_2O (\ell, 273 K, 2 atm)\]
(1) \( \Delta G = 0 \) (2) \( \Delta G < 0 \) (3) \( \Delta G > 0 \) (4) None

48. दो मैं खोलकर लें: हैंडुकेन तथा नुक्सान की दरों का अनुपात होगा?
(1) 16:1 (2) 4:1 (3) 14 (4) 1:16

49. \( PH_3(g) \) की प्रथम फिक्सेशन एंड 228Kcal/mol और \( P_2H_4(g) \) की प्रथम फिक्सेशन 355Kcal/mol है तो प-प की अंतर घुंघरे गी?
(1) 102 Kcal/mol (2) 26 Kcal/mol (3) 51 Kcal/mol (4) 204 Kcal/mol

50. एक अंतर से मैं सबसे पहले देंगे गुणा क्यों?
(1) 0 (2) 1 (3) 2 (4) \( \infty \)

51. निम्नलिखित नतीजतनों में एक \( \text{NaOH} \) लिखना चाहिए?
(1) \( Na^+_{aq} + OH^-_{aq} \rightarrow NaOH_{(s)} \) 
(2) \( Na_{(s)} + \frac{1}{2} O_{2(g)} + \frac{1}{2} H_{2(g)} \rightarrow NaOH_{(s)} \) 
(3) \( 2Na_{(s)} + 2H_2O_{(l)} \rightarrow 2NaOH_{aq} + H_2(g) \) 
(4) उभय तरह से नहीं

52. 10^{-8} M HClO_{4} विल्कुल की pH है?
(1) 8 (2) 6 (3) 6 व 7 के मध्य (4) 7 व 8 के मध्य

53. रचना क्या है?
(1) \( \Delta G^o < 0 \) (2) \( \Delta S < 0 \) (3) \( \Delta S > 0 \) (4) \( \Delta G > 0 \)

54. 4.8 g यौगिक खोए, जेन ने सिस्ट में \( pH 1 \) पत्तियाँ विल्कुल का हिमाण \( 45°C \) है। यौगिक का आम \( K_f = 5.1 \text{ km}^{-1} \text{C} \) है?
(1) 100 (2) 40 (3) 200 (4) 400

(Place to get help and make it easy)
55. For the reaction \( \text{CO}_2(g) + \frac{1}{2} \text{O}_2(g) \rightarrow \text{CO}_2(g) \); \( \Delta H^\circ \)
\[-67650 \text{cal} \) at 25°C calculate \( \Delta H^\circ \) at 100°C, given that
the required heat capacities are as follows :-
\[ \begin{align*}
C_p(\text{CO}_2) &= 6.97 \text{ cal K}^{-1} \\
C_p(\text{O}_2) &= 8.97 \text{ cal K}^{-1} \\
C_v(\text{O}_2) &= 7 \text{ cal K}^{-1}
\end{align*} \]
\[ \begin{align*}
(1) & -67.54 \text{ kcal} & (2) & 0.6 \text{ kcal} \\
(3) & 10^4 \text{ kcal} & (4) & 10^{-4} \text{ kcal}
\end{align*} \]

56. 20 Kg \( \text{N}_2 \) and 3 kg \( \text{H}_2 \) are mixed to produce \( \text{NH}_3 \).
The amount of \( \text{NH}_3 \) produced is :-
\[ \begin{align*}
(1) & 17 \text{ kg} & (2) & 20 \text{ kg} \\
(3) & 34 \text{ kg} & (4) & 3 \text{ kg}
\end{align*} \]

57. Which of the following is not a path function but an extensive property :-
(1) Temperature
(2) Internal energy
(3) Molar heat Capacity
(4) Work

58. For the reaction \( \text{A} + \text{B} \rightarrow \text{C} + \text{D} \), If the temperature is increased then concentrations of the products will :-
(1) Increase
(2) Decrease
(3) remain same
(4) Become zero

59. The enthalpy of neutralization of oxalic acid by strong base is \(-25.4 \text{ Kcal/mol} \). The enthalpy of neutralization of reaction between strong acid and strong base is \(-13.7 \text{ Kcal/eq} \). What will be enthalpy of dissociation of oxalic acid as
\[ \text{H}_2\text{C}_2\text{O}_4 \rightarrow 2\text{H}^+ + \text{C}_2\text{O}_4^{2-} \]
\[ \begin{align*}
(1) & 1 \text{ Kcal/mol} & (2) & 2.0 \text{ Kcal/mol} \\
(3) & 18.55 \text{ Kcal/mol} & (4) & 11.7 \text{ Kcal/mol}
\end{align*} \]

60. In a dilute solution there are two equilibria :-
\[ \text{KCl}(s) \rightleftharpoons \text{K}^+ + \text{Cl}^-; K_1 = 10^4 \]
\[ \text{Ag}^+ + \text{Cl}^- \rightleftharpoons \text{AgCl}(s); K_2 = 10^9 \]
The equilibrium constant for the reaction :-
\[ \text{Ag}^+ + \text{KCl}(s) \rightleftharpoons \text{K}^+ + \text{AgCl}(s) \]
\[ \begin{align*}
(1) & 10^{\text{very}} & (2) & 10^{\text{very}} \\
(3) & 10^3 & (4) & 10^{\text{very}}
\end{align*} \]

61. Molar heat capacity of an ideal gas is :-
(1) can't be negatives
(2) Must be equal to either \( C_p \) or \( C_v \)
(3) Must lie in range 0.1 to 0.5
(4) May have any value between \( -\infty \) to \( +\infty \)
62. A mixture containing 100 g H₂ and 100 g O₂ is ignited so that water is formed according to the reaction \(2\text{H}_2(g) + \text{O}_2(g) \rightarrow 2\text{H}_2\text{O}(g)\). The volume of water vapours formed at the same temperature and pressure is:

(1) 112.5 litre (2) 6.25 litre (3) 140 litre (4) None of these

63. Calculate work done when 1 mol of ideal gas is compressed reversibly from 1 bar to 5 bar at constant temperature of 300 K?

(1) 967 cal (2) 1.3 cal (3) 4.606 cal (4) 10 cal

64. Calculate the pH of a solution whose 100 ml contains 0.2 g NaOH dissolved in it:

(1) 10.7 (2) 11.7 (3) 1.3 (4) 12.7

65. In a crystal (A) particles are present in ccp form, (B) particles are present in 25% octahedral void, (C) particles present in all the tetrahedral voids. What will be empirical formula of crystal?

(1) ABC (2) A₄B₈C₈ (3) A₄B₈C₂ (4) A₄BC₃

66. Which of the following equilibrium is not affected by pressure:

(1) \(2\text{CO}(g) + \text{O}_2(g) \rightleftharpoons 2\text{CO}_2(g)\)
(2) \(2\text{O}_3(g) \rightleftharpoons 3\text{O}_2(g)\)
(3) \(\text{N}_2\text{O}_4(g) \rightleftharpoons 2\text{NO}_2(g)\)
(4) None of these

67. Consider the following fcc unit cells, choose the correct option regarding (●)?

(A) (B) (C) (D)

(1) B and C represents octahedral void
(2) A and D represents position of Tetrahedral void
(3) Only B represents tetrahedral void
(4) None is correct

68. The partial pressures of \(\text{CH}_3\text{OH}, \text{CO}\) and \(\text{H}_2\) at equilibrium are 2, 1 and 0.1 atm respectively for the reaction \(\text{CO} + 2\text{H}_2 \rightleftharpoons \text{CH}_3\text{OH}\). The value of \(K_p\) for the decomposition of \(\text{CH}_3\text{OH}\) is:

(1) 200 (2) \(5 \times 10^{-3}\) (3) \(5 \times 10^{-2}\) (4) 2000
69. The lattice parameters of a given crystal are \( a = 5.62 \text{Å} \), \( b = 7.41 \text{Å} \), and \( c = 9.48 \text{Å} \). The three coordinate axes are perpendicular to each other. The crystal is:

1. Tetragonal
2. Trigonal
3. Orthorhombic
4. Monoclinic

70. The degree of dissociation of 0.05 M \( \text{NH}_3 \) solution of pH = 11 is:

1. 0.04
2. 0.002
3. 0.02
4. 0.004

71. In \( \Psi_{420} \), the value of azimuthal quantum number is:

1. \( \ell = 1 \)
2. \( \ell = 2 \)
3. \( \ell = 4 \)
4. \( \ell = 0 \)

72. Calculate the pH of a solution prepared by mixing 8.4 g \( \text{NaHCO}_3 \) with 80 ml of 1 M \( \text{HCl} \) solution.

\( \text{Given } Ka \text{ of } \text{H}_2\text{CO}_3 \text{ is } 5 \times 10^{-7} \) :

1. 5.70
2. 5.30
3. 6.70
4. 9.30

73. Which of the following sets of quantum numbers represents highest energy of an atom?

1. \( n = 4 \), \( \ell = 2 \), \( m = 0 \), \( s = + \frac{1}{2} \)
2. \( n = 3 \), \( \ell = 1 \), \( m = + 1 \), \( s = - \frac{1}{2} \)
3. \( n = 3 \), \( \ell = 2 \), \( m = - 1 \), \( s = - \frac{1}{2} \)
4. \( n = 4 \), \( \ell = 0 \), \( m = 0 \), \( s = + \frac{1}{2} \)

74. The freezing point depression of 0.001 m \( K_x[\text{Fe(CN)}_6] \) is 7.10 \( \times 10^{-3} \) K. The value of \( x \) is:

\( K_f = 1.86 \text{ K Kg mol}^{-1} \)

1. 4
2. 3
3. 2
4. 6

75. Which of the following is correct for Heisenberg uncertainty principle?

1. \( \Delta x \cdot \Delta p \geq \frac{h}{4\pi} \)
2. \( \Delta \epsilon \cdot \Delta t \geq \frac{h}{4\pi} \)
3. \( \Delta x \cdot \Delta v \geq \frac{h}{4\pi} \)
4. Both (1) & (2)

76. At STP the number of electrons in 89.6 litre water vapours are:

1. \( 2.4 \times 10^{25} \)
2. \( 4 \times 10^{25} \)
3. \( 6 \times 10^{23} \)
4. \( 6 \times 10^{24} \)
77. Which of the following electronic configuration have highest exchange energy?

(1) \[
\begin{array}{c}
3d \\
\uparrow \uparrow \uparrow \\
4s \\
\uparrow 
\end{array}
\]
(2) \[
\begin{array}{c}
3d \\
\uparrow \uparrow \uparrow \uparrow \uparrow \\
4s \\
\uparrow 
\end{array}
\]
(3) \[
\begin{array}{c}
3d \\
\uparrow \downarrow \uparrow \downarrow \uparrow \uparrow \\
4s \\
\uparrow 
\end{array}
\]
(4) \[
\begin{array}{c}
3d \\
\uparrow \downarrow \uparrow \downarrow \uparrow \uparrow \uparrow \\
4s \\
\uparrow 
\end{array}
\]

78. Which of the following has maximum weight:

(1) 1.2 g atom of N
(2) \(1 \times 10^{23}\) atoms of carbon
(3) 1.12 litre \(O_2\) at STP
(4) Same

79. If M is the magnetic quantum number and \(\ell\) is azimuthal quantum number, then:

(1) \(M = \ell + 2\)  
(2) \(M = 2\ell^2 + 1\)  
(3) \(\ell = \frac{M-1}{2}\)  
(4) \(\ell = 2M + 1\)

80. The vapour pressure of pure P and Q are 108 and 36 bar respectively. What is the mole fraction of Q in the vapor phase of the solution containing equimolar mixture of P and Q?

(1) 0.5  
(2) 0.66  
(3) 0.25  
(4) 0.75

81. A K.W radiotransmitter operates at frequency of 800 Hz : How many photons per sec does it emit?

(1) \(1.6 \times 10^{21}\)  
(2) \(6.023 \times 10^{23}\)  
(3) \(1.86 \times 10^{32}\)  
(4) \(2.85 \times 10^{16}\)

82. \(Al_2(SO_4)_3 \cdot XH_2O\) has 10% aluminium (Atomic weight = 27) by mass. The value of X is:

(1) 4  
(2) 11  
(3) 6  
(4) 15

83. For the reaction \(2NO(g) + O_2(g) \rightleftharpoons 2NO_2(g)\), \(K_p\) is \(1.24 \times 10^{-2}\) at 727°C. The value of \(K_c\) for this reaction is:

(1) 10  
(2) 0.1  
(3) 1  
(4) None of these
84. In the system, $\text{CaF}_2(s) \rightleftharpoons \text{Ca}^{2+}(aq) + 2\text{F}^-(aq)$, increasing the equilibrium concentration of $\text{Ca}^{2+}$ ions 4 times will cause the equilibrium concentration of $\text{F}^-$ ions to change to :-

(1) $\frac{1}{4}$ times  
(2) 4 times  
(3) 2 times  
(4) $\frac{1}{2}$ times

85. Calculate the amount of $\text{CO}_2$ in a soft drink, with a partial pressure of $\text{CO}_2$ of 4 atm over the liquid at 25°C. The Henry’s constant of $\text{CO}_2$ is $3.1 \times 10^{-2}$ mol L$^{-1}$ atm$^{-1}$ :-

(1) 0.12 M  
(2) 1.2 M  
(3) 0.08 M  
(4) 0.27 M

86. At 17°C, the Osmotic pressure of urea solution is 525 mm. The solution is diluted and the temperature is raised to 27°C. The osmotic pressure of dilute solution is 105 mm at 25°C. The ratio of the original to final volume of solution is:-

(1) 1 : 5  
(2) 5 : 1  
(3) 1 : 4  
(4) 1 : 6

87. The ionisation constant of $\text{HNO}_2$ is $5 \times 10^{-5}$. Calculate the pH of 0.04 M $\text{NaNO}_2$ solution is:-

(1) 9.85  
(2) 8.45  
(3) 9.15  
(4) 5.55

88. Which of the following is most soluble :-

(1) $\text{M(OH)}_2$ ($K_{sp} = 1 \times 10^{-30}$)  
(2) $\text{M(OH)}_3$ ($K_{sp} = 1 \times 10^{-36}$)  
(3) $\text{MOH}$ ($K_{sp} = 1 \times 10^{-28}$)  
(4) Same

89. On mixing 20 ml of acetone with 60 ml of chloroform, the total volume of the solution is:-

(1) < 80 ml  
(2) > 80 ml  
(3) = 80 ml  
(4) Can’t be predicted

90. Number of $\text{H}^+$ ions in 100 ml of 0.001 M $\text{H}_2\text{SO}_4$ solution is :-

(1) $1.2 \times 10^{18}$  
(2) $1.2 \times 10^{19}$  
(3) $1.2 \times 10^{20}$  
(4) $6 \times 10^{20}$
91. In the member of Ascomycetes and Basidiomycetes formation of fruiting body takes place:–
   (1) Before karyogamy
   (2) After karyogamy
   (3) Either before or after karyogamy
   (4) Not definite

92. Information storage and energy transfer are primary functions of:–
   (1) Lipo-polysaccharide
   (2) Nucleotide
   (3) Carbohydrate
   (4) Protein

93. Dikaryotization is a process which only occur in the member of:–
   (1) Ascomycetes
   (2) Basidiomycetes
   (3) Both 1 and 2
   (4) None of the above

94. Which is not true for DNA:–
   (1) DNA shows optical activity due to D-sugar component
   (2) Deoxyribose sugar present in the form of β-form
   (3) DNA is negatively charged due to PO₄³⁻ group
   (4) None of above

95. Dikaryotization involve:–
   (1) Fusion of cytoplast of two gamete
   (2) Fusion of opposite strain nucleus
   (3) Pairing of opposite strain nucleus
   (4) All of the above

96. Agar-Agar is a polysaccharide for preparing solid culture media, composed of:–
   (1) Galactose + mannose
   (2) Galactose and sulphur containing carbohydrates
   (3) Galactose + Amino acid
   (4) N-acetyl D-glycosamine

97. The member of Phycomycetes may be:–
   (1) Only saprophytic
   (2) Only parasitic
   (3) May be parasitic or saprophytic
   (4) Some time autotrophic also

98. Nicotinamide is the derivative of:–
   (1) Glycine
   (2) Tryptophan
   (3) Tyrosine
   (4) Phenylalanine

99. The member of Ascomycetes and Basidiomycetes formation of fruiting body takes place:–
   (1) Before karyogamy
   (2) After karyogamy
   (3) Either before or after karyogamy
   (4) Not definite
99. Zoospore and aplan spore of the member of ascomycetes are born: -
   (1) Exogenously
   (2) Zoospore born exogenously while aplan spore born endogenously
   (3) Both born endogenously
   (4) Zoospore endogenously while aplan spore exogenously

100. Porkaryotic mRNA recognize the smaller subunit of ribosome with the help of: -
   (1) Shine-dalgarno sequence (5' AGGAGGU3')
   (2) Antishine-Dalgarno sequence–3' UCCUCCU3'
   (3) 7 mG cap
   (4) Poly adenine tail

101. In member of phycomycetes the sexual reproduction is: -
   (1) Isogamous
   (2) Anisogamous
   (3) Oogamous
   (4) All of the above

102. Which of the following is an example of unsaturated fatty acid: -
   (1) Palmitic acid
   (2) Stearic acid
   (3) Oleic acid
   (4) None of these

103. Match the column-A with column-B and find out the correct answer: -

<table>
<thead>
<tr>
<th>Column-A</th>
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</tr>
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<tbody>
<tr>
<td>(a)</td>
<td>Mushroom</td>
</tr>
<tr>
<td>(b)</td>
<td>Smut fungi</td>
</tr>
<tr>
<td>(c)</td>
<td>Rust fungi</td>
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<tr>
<td>(d)</td>
<td>Basidiospore</td>
</tr>
<tr>
<td>(a)</td>
<td>Exogenously</td>
</tr>
<tr>
<td>(b)</td>
<td>Ustilago</td>
</tr>
<tr>
<td>(c)</td>
<td>Agaricus</td>
</tr>
<tr>
<td>(d)</td>
<td>Puccinia</td>
</tr>
</tbody>
</table>

104. Vanaspati ghee and margarine are: -
   (1) Solid fat
   (2) Liquid fat
   (3) Monoglyceride
   (4) Rich in unsaturated fatty acid

105. Match the column-A with column-B and select the correct answer: -

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106. Which is common in DNA and RNA:­
(1) Thymine
(2) Uracil
(3) Ribose
(4) H₃PO₄

107. Asexual reproduction by conidium takes place in which of the following:­
(1) Alternaria
(2) Collectotrichum
(3) Trichoderma
(4) All of the above

108. Glycogen is similar to:­
(1) Amylose of starch
(2) Amylopectin of starch
(3) Cellular
(4) Chitin

109. Match the column-A with column-B and find out the correct answer:­

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<td>(P) Fungal component</td>
</tr>
<tr>
<td>(b) Mycobiont</td>
<td>(Q) Viroid</td>
</tr>
<tr>
<td>(c) Potato spindle tube disease</td>
<td>(R) Lichen</td>
</tr>
<tr>
<td>(d) Obligate parasite</td>
<td>(S) Virus</td>
</tr>
</tbody>
</table>

(a) a-R, b-P, c-S, d-Q    (b) a-R, b-S, c-P, d-Q    (c) a-S, b-R, c-P, d-Q    (d) a-R, b-P, c-Q, d-S

110. Nitrogen containing homopolysaccharide is:­
(1) Chitin
(2) Starch
(3) Glycogen
(4) Cellulose

111. In lichen fungal component responsible to provide
(1) Shelter to phycobiont
(2) Mineral nutrient
(3) Water
(4) All of the above

112. Storage carbohydrates are generally polysaccharide because:­
(1) These are osmotically inactive
(2) These are chemically inert
(3) These are compact molecule
(4) All the above

113. In which system of classification both vegetative and sexual characters are given equal weightage
(1) Rational classification
(2) Natural classification
(3) Artificial classification
(4) Praylogenetic classification

106. DNA व RNA में क्या उत्पत्ति है?
(1) कैल इमी न (2) यू रे सिल (3) र इबोजी (4) H₃PO₄

107. इनमें से किसके अलग गिफत्मेचुके हैं?
(1) खट टे खय (2) को ली टे ट (3) उ फे व त सी (4) उ फे व त सी

108. ला इकोज जा फिको से सा है?
(1) रटा चे के पास इले जात त के (2) रटा चे के पास इले पेड़ने के (3) सेल्यु लो ज (4) का इट न

109. रां-भाष के सर्वसाधारण से लित की जित और रकी उत्तर की पुष्टि की जित?

110. नाइट्रोजन वाणीजक उसी वस्तु व में पोशाक लीस ने के राइट है?
(1) बर्ने देख (2) रटा चे (3) बर्ने लीके ज (4) सेल्यु लो ज

111. लीके है के करब्बंग उटा व द ने है?
(1) वी बा ल भा ग के वा ने ने के लाइ (2) न निजाद या (3) का (4) उ फे व त सी

112. संग हं वा बाएँ हाइड रेट न सारण व मत्र पे लीस के रा इके बने कि?
(1) ए पा वा के दिफट से निषिद्ध है ते है (2) ए पा वा वर्चुला टे प निषिद्ध है है (3) ए संधा नित अर है ते है (4) उ फे व त सी

113. किसके बारे कर्म ते ज मे बधी और रप्ले गिफत्मान पे के बारे खो दो बते है?
(1) रे नल बग बारे (2) प्रो कृतिक बारे बारे (3) कृतिक वारे बारे (4) उ घटिके से य बारे बारे
114. Complementarity of two polynucleotide strands is shown. The strands P and Q represent

(1) P : t–RNA Q : m–RNA
(2) P : c–DNA Q : m–RNA
(3) P : chromosomal DNA Q : m–RNA
(4) P : c–DNA ; Q : chromosomal DNA

115. In natural system of classification :-
(1) only natural offinities among the organism’s consider
(2) it also consider anatomical feature
(3) it also consider embryology and phytochemistry of plant
(4) All the above

116. Which stage is longest in cell cycle :-
(1) G₁-phase (2) Prophase (3) S–Phase (4) Telophase

117. Cytotaxonomy is based on :-
(1) Chromosomes number (2) Chromosomes structure
(3) Behaviour of chromosomes (4) all of the above

118. Centromere divides during :-
(1) Pachytene (2) Anaphase–II (3) Prophase (4) Metaphase

119. In which one type of taxonomy is helpful in solving evolutionary problem in phylogenetic classification :-
(1) Numerical taxonomy (2) Cytotaxonomy
(3) Chemotaxonomy (4) All of the above

120. Which pigment not founds in plastid :-
(1) Xanthophyll (2) Carotene (3) Anthocyanin (4) Chlorophyll

121. In isogamous method of sexual Reproduction in algae. Isogametes are :-
(1) always motile and similar in size (2) may be non motile and similar in size
(3) will imotile but disimilar in size (4) Both (1) and (2)
122. In the given figure of structural unit of chromosome, name the parts A, B & C?

![Image of structural unit of chromosome]

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>DNA</td>
<td>Histone octamer</td>
<td>$H_1$ histone octamer</td>
</tr>
<tr>
<td>(2)</td>
<td>Histone octamer</td>
<td>$H_1$ histone</td>
<td>DNA</td>
</tr>
<tr>
<td>(3)</td>
<td>DNA</td>
<td>$H_1$ histone octamer</td>
<td>Histone octamer</td>
</tr>
<tr>
<td>(4)</td>
<td>DNA</td>
<td>$H_1$ histone</td>
<td>DNA</td>
</tr>
</tbody>
</table>

123. Static (Female gameti) is the characteristics of which type of sexual reproduction:
(1) Isogamous
(2) Anisogamous
(3) Planogametic copulation
(4) Oogamous

124. Given above is the representation of certain event of particular stages of a type of cell division. Which this stage?
(1) Prophase of mitosis
(2) Both prophase and metaphase
(3) Prophase-I during meiosis
(4) Prophase-II during meiosis

125. Find out the incorrect match pair:
(1) Algain – Brown algai
(2) Carrageen – Red algai
(3) Algin, carrageen, Agar-hydrocolloides
(4) Algin, Carrageen – Hydrocolloids
126. Synthesis of steroidal hormone is a function of: -
   (1) Ribosomes  (2) Rough ER
   (3) Smooth ER  (4) All

127. Match the column-A with column-B and select correct answer: -

<table>
<thead>
<tr>
<th>Column-A</th>
<th>Column-B</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) Algin, carrageen</td>
<td>(P) Porphyra, Laminaria, Sargassum</td>
</tr>
<tr>
<td>(b) Agar</td>
<td>(Q) Gellidium, Gracilaria</td>
</tr>
<tr>
<td>(c) Unicellular algae</td>
<td>(R) Brown algae, Red algae</td>
</tr>
<tr>
<td>(d) Species of marine used as food</td>
<td>(S) Spirullina, Chlorella</td>
</tr>
</tbody>
</table>

   (1) a-R, b-Q, c-P, d-S  (2) a-R, b-Q, c-S, d-P  
   (3) a-R, b-S, c-Q, d-P  (4) a-S, b-R, c-Q, d-P

128. Middle lamella layer is mainly consist of: -
   (1) Xylem, pectin  (2) Calcium-pectate
   (3) Suberin-lignin  (4) Plasmodesmata

129. Agar obtained from Gillidium and gracillaria is used to: -
   (1) To grow microbes  (2) Preparation of icecream and jellies
   (3) Used as hydrocolloids  (4) Both (1) and (2)

130. What is correct for this diagram?

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>Ribosome</td>
<td>SER</td>
<td>Nucleus</td>
<td>SER</td>
</tr>
<tr>
<td>(2)</td>
<td>SER</td>
<td>Ribosome</td>
<td>RER</td>
<td>Nucleus</td>
</tr>
<tr>
<td>(3)</td>
<td>Nucleus</td>
<td>RER</td>
<td>Ribosome</td>
<td>SER</td>
</tr>
<tr>
<td>(4)</td>
<td>RER</td>
<td>Nucleus</td>
<td>Ribosome</td>
<td>SER</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
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<tr>
<td>(1)</td>
<td>Ribosome</td>
<td>SER</td>
<td>Nucleus</td>
<td>RER</td>
</tr>
<tr>
<td>(2)</td>
<td>SER</td>
<td>Ribosome</td>
<td>RER</td>
<td>Nucleus</td>
</tr>
<tr>
<td>(3)</td>
<td>Nucleus</td>
<td>RER</td>
<td>Ribosome</td>
<td>SER</td>
</tr>
<tr>
<td>(4)</td>
<td>RER</td>
<td>Nucleus</td>
<td>Ribosome</td>
<td>SER</td>
</tr>
</tbody>
</table>
131. In the member of chlorophyceae: -
(1) Outer all wall is cellulosic which inner all wall
is pectic
(2) Outer cell wall is pectin and inner all wall is
cellulosic
(3) Outer cell wall is lignified and inner cell wall
is cellulosic
(4) All of the above

132. Which of the following is incorrect: -
(1) Cell wall, plastids and a large central vacuole
absent in animal cells
(2) Eukaryotes included all protists, plants,
animals and monera
(3) Polysomes involved in protein biosynthesis
(4) Electron microscope was invented by Knoll
and Ruska

133. In the member of chlorophyceae the
photosynthetic pigments are:
(1) only chl. a
(2) only chl. b
(3) chl. a and chl. c
(4) chl. a and chl. b

134. Besides the nucleus, the eukaryotic cells have
other membrane bound distinct structure called as

(1) Cisternae (2) Strome
(3) Organelle (4) Microsome

135. Pyrinoids are protein particle found in:
(1) in the member of phaeophyceae
(2) in the member of chlorophyceae
(3) Both in the member of phaeophyceae and
chlenphyceae
(4) in the member of Rhodophyceae

136. Which one is correct for vascular cambium?
(1) It is also known as phelloderm.
(2) It develops in the extra stelar region of dicot
stem.
(3) It is made up of rounded cells only.
(4) It is a single layered thick

137. In the member of phaeophyceae the cell wall is
double layred inner cell wall in cellulosic which
out all wall composed of:
(1) Pectin (2) Pectose
(3) Algin (4) Liginin
138. Heart wood is durable and resistant to the attacks of micro-organisms and insects due to
(1) Deposition of silica, lignin & pectin
(2) Pressure of sap wood & bark
(3) Excessive transpiration
(4) Deposition of tannins, resins, oils, gums etc.

139. In the member of phaeophyceae which part of body functions as photosynthetic part:
(1) Vellum (2) Stipe
(3) Hold fast (4) Frond

140. Which of the following wood does not conduct water but gives only mechanical support to the stem.
(1) Sap wood (2) Spring wood
(3) Autumn wood (4) Heart wood

141. Match the column-A with column-B and find out correct answer:

<table>
<thead>
<tr>
<th>Column-A</th>
<th>Column-B</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) Starch</td>
<td>(P) Green algae</td>
</tr>
<tr>
<td>(b) Lamanarin and manitol</td>
<td>(Q) Brown algae</td>
</tr>
<tr>
<td>(c) Floridean starch</td>
<td>(R) Red algae</td>
</tr>
<tr>
<td>(d) Pyrorines</td>
<td>(S) Proteins</td>
</tr>
</tbody>
</table>

(1) a-P, b-Q, c-S, d-R
(2) a-P, b-S, c-Q, d-R
(3) a-S, b-P, c-Q, d-R
(4) a-P, b-Q, c-R, d-S

142. All of the following statements are correct, except
(1) The vascular cambium is generally more active on the outer side than on the inner.
(2) At some places, the vascular cambium forms secondary medullary rays/vascular rays
(3) The activity of vascular cambium is under the control of physiological and enviromental factors.
(4) The primary xylem however remains more or less intact, in or around the centre during secondary growth.

143. In the member of phaeophyceae gametes are
(1) Non motile pyriform
(2) Motile pyriform
(3) Motile pear shaped
(4) Motile, biflagellated, laterally attached flagella pyriform or pear shaped
144. The tissue involved in secondary growth, are the two meristems namely
   (1) Apical meristem and vascular cambium
   (2) Intercalary meristem and cork cambium
   (3) Vascular cambium & cork cambium
   (4) All of the above

145. The pigment which dominates in Red algae:
   (1) Ch a
   (2) Chl c
   (3) c phycoerythrin
   (4) r phycoerythrin

146. Which of the following statement regarding collenchyma is correct
   (1) Collenchymatous cells often do not contain chloroplasts.
   (2) Collenchyma occurs in layers below the epidermis in monocotyledonous stems.
   (3) They provide mechanical support to the growing parts of the plant such as young stem and petiole of a leaf.
   (4) They are commonly found in pulp of fruits like guava, pear.

147. Complex post fertilization developments takes placed in the member of:
   (1) Rhiodophyceae
   (2) Chlorophyceae
   (3) Phacophyceae
   (4) All of the above

148. Which statement is not correct about vessels?
   (1) They are elongated cells with tapering ends.
   (2) They are dead and without protoplasm.
   (3) Vessel members are interconnected through perforations in their common walls.
   (4) In flowering plants, tracheids and vessels are main water transporting elements.

149. Bryophytes play an important role in which type of ecological successian:
   (1) Hydrosere
   (2) Xerosere
   (3) Psamosere
   (4) None of the above
150. Following figure represents :-

(1) Hygroscopic roots of orchids
(2) Respiratory roots of Avecinia
(3) Pneumatophores of Rhizophora
(4) Aerial roots of Monstera

151. Consider the following four statements [A-D] and select the option which one includes all the correct ones only :-

(A) Each category referred to a unit of classification termed as taxon
(B) Family is a group of related orders
(C) Kingdom monera includes all prokaryotic organisms
(D) Plasmodium is a parasitic sporozoan

152. Which figure shows twisted aestivation :-

(a) (b) (c) (d)

153. Which of the following disease caused by trypanosoma ?

(1) Kala-azar
(2) Diarrhoea
(3) Sleeping sickness
(4) None of the above
154. Which figure shows aestivation of Fabaceae family :-

(a) (b) (c) (d)

155. Consider the four statements [A-D] of body organisation :-
(A) Cellular level
(B) Tissue level
(C) Organ level
(D) Organ-system level
Which of above statement is correct for animals of Arthropoda ?
(1) A (2) B (3) C (4) D

156. Match the column–I with column–II and find out the correct combination :-

<table>
<thead>
<tr>
<th>Column–I</th>
<th>Column–II</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a)</td>
<td>Bulliform cells</td>
</tr>
<tr>
<td>(b)</td>
<td>Subsidiary cells</td>
</tr>
<tr>
<td>(c)</td>
<td>Epithem tissue</td>
</tr>
<tr>
<td>(d)</td>
<td>Complementary cells</td>
</tr>
<tr>
<td>(i)</td>
<td>Stomata</td>
</tr>
<tr>
<td>(ii)</td>
<td>Hydathodes</td>
</tr>
<tr>
<td>(iii)</td>
<td>Grass leaf</td>
</tr>
<tr>
<td>(iv)</td>
<td>Lenticels</td>
</tr>
</tbody>
</table>

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

157. Which of the following consider as primitive multicellular animals of animal kingdom ?
(1) Protozoans
(2) Bacteria
(3) Sponge
(4) Coral

158. In frog the sinus venosus is located on :-
(1) Dorsal surface of the heart of frog
(2) Ventral surface of the heart of frog
(3) Dorsal surface of the kidney
(4) Ventral surface of the kidney
159. Read the four statement [A-D] carefully :
(A) Cellular level of body organisation
(B) Water vascular system
(C) Animal are dioecious
(D) Development indirect
How many of the above statements are correct about poriferans ?
(1) One (2) Two (3) Three (4) Four

160. Study the following statements and select which are not related to earthworm :-
(a) Locomotion carried by setae and sucker
(b) Four pair of spermathecal pore present at mid-ventral of the 5th to 9th segments
(c) Setae is absent in first, Last and clitellar segments
(d) Circular muscle is absent in body wall of clitellar segments
(1) a, b & c (2) a, b & d (3) b, c & d (4) a, c & d

161. How many animals given below have radial symmetry ?
Sycon, Hydra, Fasciola, Pheretima, Asterias, Amphioxus,
(1) One (2) Two (3) Three (4) Four

162. The malpighian tubules in cockroach open at the junction of :-
(1) Gizzard and Midgut (2) Midgut and Ileum (3) Ileum and Colon (4) Midgut and Foregut

163. Which of following exhibit alternation of generation [Metagenesis] ?
(1) Pleurobranchia (2) Spongilla (3) Obelia (4) Loligo

164. Alary muscles in cockroach are related with :-
(1) Brain (2) Heart (3) Gut (4) Wings

165. Match the correct option of column-A with the column-B and choose the correct answer.

<table>
<thead>
<tr>
<th>Column-A</th>
<th>Column-B</th>
</tr>
</thead>
<tbody>
<tr>
<td>(A) Combjelly (i) Aschelminthes</td>
<td></td>
</tr>
<tr>
<td>(B) Flat worm (ii) Osteichthyes</td>
<td></td>
</tr>
<tr>
<td>(C) Round worm (iii) Ctenophora</td>
<td></td>
</tr>
<tr>
<td>(D) Bonyfishes (iv) Platyhelminthes</td>
<td></td>
</tr>
</tbody>
</table>

(1) A-iii, B-iv, C-ii, D-i
(2) A-ii, B-iv, c-iii, D-i
(3) A-iii, B-iv, c-i, D-ii
(4) A-iv, B-iii, C-i, D-ii
166. Given below is the diagramatic sketch of a certain type of tissue, select the correct option regarding identification and location in body.

- Dense connective tissue: Tendon and ligaments
- Dense irregular tissue: In the skin
- Dense regular tissue: Ligaments and tendons
- Specialised connective tissue: Beneath the skin

167. Given below is the diagramatic sectional view of the body of animal which shows:

- Diploblastic, coelomate animals
- Triploblastic, coelomate animals
- Diploblastic, acoelomate animals
- Triploblastic, acoelomate animals

168. This epithelium is made up of a single thin layer of flattened cells and is involved in diffusion, it is found in:

- Walls & blood vessels
- Ducts of glands
- Convoluted parts of nephrons
- All of these
169. निम्नलिखित चार कथनों का वांछित प्रयोग करके कह दीजिए -
(A) मछलियों में दो का एक क्षंभ होता है।
(B) इनके इन्स्ट्रूमेंट में अंत: के बीच विभिन्न चरण व अंग्नें का होता है।
(C) मास का शरीर धातुजड़ इक्‌सिकल होता है।
(D) कपड़ों लोगों के आयुर्विज्ञान लोगों के लिए अनुसरण करते हैं।

बताइए कि इन हर प्रकार के कथनों की संख्या कितनी है?
(1) एक (2) दो (3) तीन (4) चार

170. निम्नलिखित चार कथनों का अद्वितीय समान्तरता निकालीजिए।
(A) सीलों के खंडी-खंडी 
(B) कपड़ों के देशी खंडी-खंडी 
(C) तंत्रिका और ब्रांडशील 
(D) संदर्भित लश्कर के अलग-अलग 

(1) (A) (2) (B) (3) (C) (4) (D)

171. निम्नलिखित तकनीक विकल्पों का उपयोग विकल्प में दिए गए सभी आयुर्विज्ञान विकल्प का आधुनिक तथा आयुर्विज्ञान का प्रदर्शन करता है?
(1) सामग्री - टू-टू (2) सामग्री - दो
(3) सामग्री - चार (4) सामग्री - चार

172. निम्नलिखित चार कथनों का अद्वितीय समान्तरता निकालीजिए।
(A) पूर्वी रचना से अग्रेसी रचना 
(B) पूर्वी रचना से अग्रेसी रचना 
(C) पूर्वी रचना से अग्रेसी रचना 
(D) पूर्वी रचना से अग्रेसी रचना 

(1) (A) (2) (B) (3) (C) (4) (D)

173. निम्नलिखित चार वाक्यों का प्रयोग आयुर्विज्ञान रचना की जिथे आयुर्विज्ञान के विकल्प से उपयोग करने वाले कथनों का आधुनिक पुनर्निर्माण करें।
(A) निम्नलिखित अनुसरण के द्वारा उसे वर्तमान समय में वर्तमान रूप में लिखिये।
(B) सीलों के खंडी-खंडी लश्कर के प्रदर्शन करने वाले 
(C) सीलों के खंडी-खंडी 
(D) सीलों के खंडी-खंडी लश्कर के प्रदर्शन करने वाले 

(1) (A) (2) (B) (3) (C) (4) (D)
174. Match the column and find out the correct answer.

| A | Phagocytic cell | i. | Lymphocytes |
| B | Resist infection | ii. | Basophils |
| C | Involved in inflammatory reactions | iii. | Monocytes |
| D | Responsible for immune response | iv. | Eosinophils |

(1) A–iv, B–iii, C–ii, D–i  
(2) A–iii, B–iv, C–i, D–ii  
(3) A–iii, B–iv, C–ii, D–i  
(4) A–i, B–iv, C–iii, D–i

175. In which of the following reptiles, four chambered heart present?

(1) Camelus  
(2) Testudo  
(3) Corvus  
(4) Crocodilus

176. Which of the following statement(s) is/are not correct with respect to platelets?

(A) Are cell fragments produced from megakaryocytes  
(B) Blood normally contains 1,50,000-3,50,000 mm$^{-3}$  
(C) Release a variety of substances most which are involved in clotting of blood  
(D) An increase in their number will lead to excessive loss of blood from the body

(1) A & C  
(2) B & D  
(3) Only D  
(4) None of these

177. Read the following statements of animals carefully:

(A) Creeping mode of locomotion  
(B) Air sacs connected to lungs  
(C) Fertilization internal  
(D) Skin is dry and cornified

How many of the above statements are correct according to the reptiles?

(1) One  
(2) Two  
(3) Three  
(4) Four

178. Match the column-A with the column-B and choose the correct answer:

<table>
<thead>
<tr>
<th>Column-A</th>
<th>Column-B</th>
</tr>
</thead>
<tbody>
<tr>
<td>(A) Rattus</td>
<td>(i) Jointed appendages</td>
</tr>
<tr>
<td>(B) Scoliodon</td>
<td>(ii) Shell</td>
</tr>
<tr>
<td>(C) Pila</td>
<td>(iii) Mammary glands</td>
</tr>
<tr>
<td>(D) Locusta</td>
<td>(iv) Scales</td>
</tr>
</tbody>
</table>

(1) A–iv, B–iii, C–ii, D–i  
(2) A–iii, B–iv, C–i, D–ii  
(3) A–iii, B–iv, C–ii, D–i  
(4) A–i, B–iv, C–iii, D–i

174. Your Target is to secure Good Rank in Pre-Medical 2013

174. की लंबी किमित्त का स्त्री की उत्तम को चाहे तो तार को छंट लिये तो?

| A | वाणी से को वीरे दे | i. | लॉर्ड स्टोल, सी |
| B | रोड़ के संलिप्त दे | ii. | बैरे रमेश सा |
| C | वाणी का लंब फ़िल आ | iii. | मो तो रमेश सा |
| D | अधिक प्रतिक्रिया के | iv. | इंग्रिदर फिल सा |

(1) A–iv, B–iii, C–ii, D–i  
(2) A–iii, B–iv, C–i, D–ii  
(3) A–iii, B–iv, C–ii, D–i  
(4) A–i, B–iv, C–iii, D–i
179. In which of the following group of animals, bioluminescence is well marked.
(1) Poriferans  (2) Flat worms  (3) Molluscs  (4) Ctenophores

180. Given below is the diagram of animal. What is the name and its phylum of animal:

<p>| | |</p>
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</table>

(1) *Echinus*, mollusca
(2) *Ophiura*, Echinodermata
(3) *Antedon*, Echinodermata
(4) *Cucumaria*, Echinodermata

Your moral duty is that to prove **ALLEN is ALLEN**
Your Target is to secure Good Rank in Pre-Medical 2013

SPAC FOR ROUGH WORK / रफ कर्यं के लिये जाह