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

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 Your Form No.
1. Vector \( \vec{a} \) is perpendicular to \( \vec{b} \). Component of 
\((\vec{a} - \vec{b})\) along \((\vec{a} + \vec{b})\) will be –
(1) Zero  
(2) \( \vec{a} - \vec{b} \)  
(3) \( \frac{a^2 - b^2}{\sqrt{a^2 + b^2}} \)  
(4) \( \sqrt{a^2 + b^2} \)

2. A child is standing with folded hands at the center of a platform rotating about its central axis. The kinetic energy of the system is \( K \). The child now stretches his arm so that moment of inertia of the system doubles. The kinetic energy of the system now is :-
(1) \( 2K \)  
(2) \( \frac{K}{2} \)  
(3) \( \frac{K}{4} \)  
(4) \( 4K \)

3. Soap bubbles look coloured due to –
(1) Dispersion  
(2) Reflection  
(3) Interference  
(4) Any one of these

4. If suddenly the gravitational force of attraction between earth and a satellite revolving around it becomes zero then the satellite will :-
(1) continue to move in its orbit with same velocity  
(2) move tangentially to the original orbit with the same velocity  
(3) become stationary in its orbit  
(4) move towards the earth

5. A body oscillates with SHM according to the equation 
\( x = 5.0 \cos(2\pi t + \pi) \). At time \( t = 1.5 \) s, its displacement, speed and acceleration respectively is
(1) 0, \(-10\pi, 20\pi^2\)  
(2) 5, 0, \(-20\pi^2\)  
(3) 2.5, \(+20\pi, 0\)  
(4) \(-5.0, +5\pi, -10\pi^2\)

6. A open knife edge of mass \( M \) is dropped from a height \( h' \) on a wooden floor. If the blade penetrates a distance \( S' \) into the wood, average resistance offered by the wood to the blade is
(1) \( Mg \)  
(2) \( Mg \left(1 + \frac{h}{S} \right) \)  
(3) \( Mg \left(1 - \frac{h}{S} \right) \)  
(4) \( Mg \left(1 + \frac{h}{S} \right)^2 \)
7. Two persons A and B running on a track in the same direction observe a car. A says that the car is moving in east direction and B says that the car is moving in north direction. They contradict the direction but say that magnitude is same. If the speed of B is double that of the speed of A, then the true direction of the car will be :-

(1) \( \theta = \tan^{-1}\left(\frac{1}{2}\right) \) North of East

(2) \( \theta = \tan^{-1}\left(\frac{1}{2}\right) \) South of East

(3) \( \theta = \tan^{-1}\left(\frac{1}{3}\right) \) North of East

(4) None of these

8. The near point of a person is at 50 cm. What is the power of the lens required to enable the person to read clearly a book held at 25 cm.

(1) 1D (2) \(-1D\) (3) 2D (4) \(-2D\)

9. If \( H_C, H_K \) and \( H_F \) are heat required to raise the temperature of one gram of water by one degree in celsius, kelvin and Fahrenheit temperature scales respectively then :-

(1) \( H_K > H_C > H_F \) (2) \( H_F > H_C > H_K \)

(3) \( H_K = H_C > H_F \) (4) \( H_K = H_C < H_F \)

10. Let \( n_p \) and \( n_e \) be the numbers of holes and conduction electrons in an extrinsic semiconductor.

(1) \( n_p > n_e \) (2) \( n_p = n_e \)

(3) \( n_p < n_e \) (4) \( n_p \neq n_e \)

11. A rocket of initial mass 1500 kg ejects gas at a constant rate of 10 kg/s with a relative speed of 5 km/s. What is the acceleration of the rocket 50 seconds after the launch, neglecting gravity:-

(1) 10 m/s\(^2\) (2) 25 m/s\(^2\)

(3) 50 m/s\(^2\) (4) 100 m/s\(^2\)
12. In the adjacent shown circuit, a voltmeter of internal resistance R, when connected across B and C reads $\frac{100}{3}$ V. Neglecting the internal resistance of the battery, the value of R is:

(1) 100 kΩ (2) 75 kΩ (3) 50 kΩ (4) 25 kΩ

13. In young's double slit experiment the phase difference between the two waves reaching at the location of the third dark fringes is:

(1) $\pi$ (2) $6\pi$ (3) $5\pi$ (4) $7\pi$

14. A capacitor of capacitance $2\mu$F is first charge by connecting across a 200 V battery then it is allowed to get discharged through a resistor R. The figure shows an experimental plot discharging of a capacitor. The value of R is ($\log_e 2 = 0.7$) :-

(1) 25 kΩ (2) 50 kΩ (3) 100 kΩ (4) 200 kΩ

15. An open pipe is suddenly closed with the result that the second overtone of the closed pipe is found to be higher in frequency by 100 Hz, than the first overtone of the original pipe. The fundamental frequency of open pipe will be:

(1) 100 Hz (2) 300 Hz (3) 150 Hz (4) 200 Hz
16. A wooden block with a coin placed on its top floats in water as shown in figure. The $\ell$ and $h$ are shown there. After some time the coin falls into the water then :-

(1) $\ell$ decrease and $h$ increase
(2) $\ell$ increase and $h$ decrease
(3) Both $\ell$ & $h$ increase
(4) Both $\ell$ & $h$ decrease

17. A ball moving with a velocity $v$ strikes a wall moving towards the ball with a velocity $u$. An elastic impact lasts for $t$ seconds then the mean elastic force acting on the ball is (Mass of the ball is $M$) :-

(1) $\frac{2Mv}{t}$
(2) $\frac{M(v + 2u)}{t}$
(3) $\frac{2M(v + u)}{t}$
(4) $\frac{M(2v + u)}{t}$

18. Six resistances each of value $r = 6 \Omega$ are connected between points A, B and C as shown in the figure. If $R_1$, $R_2$, and $R_3$ are the net resistance between A and B, between B and C and between A and C respectively, then $R_1 : R_2 : R_3$ will be equal to :-

(1) $6 : 3 : 2$
(2) $1 : 2 : 3$
(3) $5 : 4 : 3$
(4) $4 : 3 : 2$
19. Four spheres A, B, C and D are of same radius but made of different metals. Their densities are in ratio 6 : 3 : 4 : 5 and specific heats are in ratio 2 : 5 : 4 : 6. These are initially kept at the same temperature and placed in the same surroundings. The sphere which has the slowest rate of cooling is :-

1. C  
2. B  
3. D  
4. A  

20. A square current carrying loop is placed in uniform magnetic field. If the magnetic force on one arm of the loop is \( F \), then net magnetic force on the remaining three arms of the loop:-

1. \( 3F \)  
2. \( -3F \)  
3. \( F \)  
4. \( -F \)  

21. Two blocks of mass 8 kg and 5 kg are connected by a heavy rope of mass 3 kg. Complete system is accelerated upwards by 10 m/s\(^2\) as shown in the figure. The tension at the point ‘P’ will be :-

\[
\begin{align*}
\text{8 kg} & \quad \text{3 kg} & \quad a = \text{10 m/s}^2 \\
\text{5 kg} & \\
\end{align*}
\]

1. 80N  
2. 90N  
3. 160N  
4. 150N  

22. Which of the following statements is wrong?

1. De-Broglie waves are probability waves.  
2. De-Broglie wavelength of a moving particle is inversely proportional to its momentum.  
3. Wave nature is associated with atomic particles only.  
4. In general wave nature of matter is not observed.  

23. A spherical shell first rolls and then slips down an inclined plane. The ratio of its accelerations in two cases will be :-

\[
\begin{align*}
\text{1. } & \frac{5}{3} & \quad \text{2. } \frac{3}{5} & \quad \text{3. } \frac{15}{13} & \quad \text{4. } \frac{13}{15} \\
\end{align*}
\]
24. Two identical incandescent light bulbs are connected as shown in figure. The circuit is connected to an AC voltage source of variable frequency. Then read the following observations :

![Circuit Diagram]

Observation A :
Both bulbs will glow with same brightness on frequency \( f = \frac{1}{2\sqrt{LC}} \)

Observation B :
Bulb \( b_1 \) will glow with more brightness than bulb \( b_2 \) on \( f < \frac{1}{2\sqrt{LC}} \)

(1) Both observations are correct
(2) Both observation are incorrect
(3) Observation A is correct but observation B is incorrect
(4) Observation A is incorrect but observation B is correct

25. A monoatomic gas at a pressure \( P \), having a volume \( V \) expands isothermally to a volume \( 2V \) and then adiabatically to a volume \( 16V \). The final pressure of the gas is : (take \( \gamma = \frac{5}{3} \))

(1) 64P  (2) 32P  (3) \( \frac{P}{64} \)  (4) 16P

26. An n-p-n transistor in a common emitter mode is used as a simple voltage amplifier with a collector connected to load resistance \( R_L \) and to the base through a resistance \( R_B \). The collector-emitter voltage \( V_{CE} = 4V \), the base-emitter voltage \( V_{BE} = 0.6V \), current through collector is 4 mA and the current amplification factor \( \beta = 100 \). Calculate the value of \( R_B \):

![Transistor Diagram]

(1) 1kΩ  (2) 85kΩ  (3) 185kΩ  (4) None
27. An iron rod of length $l$ and of cross-section area $A$ is heated from 0°C to 100°C. If the rod neither expands nor bends, then the developed Force $F$ is proportional to:

- $(1) \frac{l}{2} \left( \rho^{2} \right) \left( \sqrt{l^{2} + \rho^{2}} \right)^{-1}$
- $(2) \frac{l}{2} \rho^{2} \left( \sqrt{l^{2} + \rho^{2}} \right)^{-1}$
- $(3) \frac{l}{2} \rho^{2} \left( l + \rho \right)$
- $(4) \frac{l}{2} \rho^{2} \left( l - \rho \right)$

28. A volt meter of resistance 280 Ω reads the voltage across the terminals of an old dry cell to be 1.40 V, while a potentiometer reads its voltage equal to 1.55 V. To draw maximum power from the battery, the load resistance must have the value:

- $(1) 60 \Omega$
- $(2) 45 \Omega$
- $(3) 35 \Omega$
- $(4) 30 \Omega$

29. The r.m.s. velocity of a gas at a certain temperature is $\sqrt{2}$ times that of the oxygen molecules at that temperature. The gas can be:

- $(1)$ CH$_4$
- $(2)$ He
- $(3)$ CH
- $(4)$ SO$_2$

30. Which of the following cylindrical rods of same material will conduct most heat, when their ends are maintained at the same steady temperature:

- $(1)$ Length 1 m; radius 1 cm
- $(2)$ Length 2 m; radius 1 cm
- $(3)$ Length 2 m; radius 2 cm
- $(4)$ Length 1 m; radius 2 cm

31. A block has been placed on an inclined plane. The slope angle $\theta$ of the plane is such that the block slides down the plane at a constant speed. The coefficient of kinetic friction is equal to:

- $(1) \sin \theta$
- $(2) \cos \theta$
- $(3) g$
- $(4) \tan \theta$

32. When light of wavelength 300 nm (nanometer) falls on a photo electric emitter, photo-electrons are liberated of zero KE. For another emitter, however, light of 600 nm wavelength is sufficient for creating photo-emission. What is the ratio of the work function of the two emitters:

- $(1) 1 : 2$
- $(2) 2 : 1$
- $(3) 4 : 1$
- $(4) 1 : 4$

33. A chain couples and rotates two wheels in a bicycle. The radii of bigger and smaller wheels are 0.5m. and 0.1m respectively. The bigger wheel rotates at the rate of 200 rotations per minute, then the rate of rotation of smaller wheel will be:

- $(1) 1000 \text{ rpm}$
- $(2) \frac{50}{3} \text{ rpm}$
- $(3) 200 \text{ rpm}$
- $(4) 40 \text{ rpm}$

34. When L.C.R. series circuit is connected to an alternating emf $E = 200 \sin(100\pi t + \pi/6)$ volt. Then $I = 2 \sin(100\pi t + \pi/3)$ amp current flows in circuit. The reactance of circuit is:

- $(1) 50 \Omega$ capacitive
- $(2) 50 \Omega$ inductive
- $(3) 50 \sqrt{2} \Omega$ capacitive
- $(4) 50 \sqrt{2} \Omega$ inductive

34. (a) L.C.R. का एक परिकल्पना का संचालन करता है, जहाँ तीन विद्युत के लिए:

- $(1) 50 \Omega \text{ और } 50 \Omega \text{ और } 50 \Omega$
- $(2) 50 \Omega \text{ और } 50 \Omega \text{ और } 50 \Omega$
- $(3) 50 \sqrt{2} \Omega \text{ और } 50 \sqrt{2} \Omega \text{ और } 50 \sqrt{2} \Omega$
35. The length of a given cylindrical wire is increased by 100%. Due to the consequent decrease in diameter the change in the resistance of the wire will be:
   (1) 300% (2) 200% (3) 100% (4) 50%

36. In given circuit calculate voltage across a-b:

   ![Circuit Diagram]

   (1) 10V (2) 20V (3) 30V (4) 40V

37. A pump motor is used to deliver water at a certain rate from a given pipe. To obtain thrice as much water from the pipe in the same time power of the motor has to be increased:
   (1) 3 times (2) 9 times (3) 27 times (4) 81 times

38. A body is projected vertically upward from the surface of the earth with a velocity equal to half the escape velocity. If R is radius of the earth, the maximum height attained by the body is:
   (1) R/6 (2) R/3 (3) 2R/3 (4) R

39. An ambulance blowing siren of frequency 700 Hz is moving towards a vertical wall with velocity of 2 m/s. The velocity of sound is 352 m/s. Then frequency of reflected sound heard by the driver will be:
   (1) 692 Hz (2) 695 Hz (3) 700 Hz (4) 708 Hz

40. Two point charges are kept at a certain distance from one another. The graph represent the variation of the potential along the straight line connecting the two charges.

   ![Potential Graph]

   (1) $q_A$ and $q_B$ both are positive and $|q_A| > |q_B|$
   (2) $q_A$ and $q_B$ both are negative and $|q_A| < |q_B|$
   (3) Both charges have opposite nature and $|q_A| > |q_B|$
   (4) Both charges have opposite nature and $|q_A| < |q_B|$

Use stop, look and go method in reading the question
41. A body is projected in such a way that its horizontal range and time of flight both are equal to \( \frac{\sqrt{3}}{g} \) in numerical values. The angle of projection will be:

\[
\begin{align*}
(1) \quad & \theta = \tan^{-1} \left( \frac{\sqrt{3}}{4} \right) \\
(2) \quad & \theta = \tan^{-1} \left( \frac{\sqrt{3}}{2} \right) \\
(3) \quad & \theta = \tan^{-1} \left( \frac{2}{\sqrt{3}} \right) \\
(4) \quad & \theta = \tan^{-1} \left( \frac{5}{8} \right)
\end{align*}
\]

42. Magnifying power of astronomical telescope for normal adjustment is 5. The distance between lenses is 24 cm. Focal length of the lenses are:

\[
\begin{align*}
(1) & \quad 4 \text{ cm}, 16 \text{ cm} \\
(2) & \quad 3 \text{ cm}, 15 \text{ cm} \\
(3) & \quad 6 \text{ cm}, 18 \text{ cm} \\
(4) & \quad 4 \text{ cm}, 20 \text{ cm}
\end{align*}
\]

43. During an adiabatic expansion, the increase in volume is associated with which of the following possibilities w.r.t. pressure and temperature?

<table>
<thead>
<tr>
<th>Pressure</th>
<th>Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Increase</td>
<td>Increase</td>
</tr>
<tr>
<td>(2) Decrease</td>
<td>Decrease</td>
</tr>
<tr>
<td>(3) Increase</td>
<td>Decrease</td>
</tr>
<tr>
<td>(4) Decrease</td>
<td>Increase</td>
</tr>
</tbody>
</table>

44. The current through a 6 mH inductor is shown in the following graph. The induced emf at \( t = 4 \) ms will be:

\[
\begin{align*}
(1) & \quad 3 \text{V} \\
(2) & \quad -3 \text{V} \\
(3) & \quad 4 \text{V} \\
(4) & \quad -4 \text{V}
\end{align*}
\]

45. In a certain region a uniform field \( \vec{E} = E_x \hat{i} \) exists.

If a small circle is drawn with the origin as the centre cutting the axes at \( A(a, 0) \), \( B(0, a) \), \( C(-a, 0) \) and \( D(0, -a) \). The potential at point \( A, B, C, D \) are \( V_A, V_B, V_C, V_D \) respectively then:

\[
\begin{align*}
(1) & \quad V_A > V_B > V_C > V_D \\
(2) & \quad V_C > V_B > V_D > V_A \\
(3) & \quad V_A = V_B = V_C = V_D \\
(4) & \quad V_A > V_B > V_C > V_D
\end{align*}
\]
46. The ionization energy of boron is less than that of beryllium because :-
   (1) beryllium has a higher nuclear charge than boron
   (2) beryllium has a lower nuclear charge than boron
   (3) the outermost electron in boron occupies a 2p-orbital
   (4) the 2s and 2p-orbitals of boron are degenerate

47. Mercury cathode can’t be used to obtain alkali metal in fused state because :-
   (1) Metal salt does not decompose
   (2) Metal are strong reducing agent
   (3) Metal form metal amalgam with mercury
   (4) None of the above

48. Which of the following is not present in nucleic acid :-
   (1) Uracil
   (2) 2-aminopyridine
   (3) Thymine
   (4) Adenine

49. R–COOH \( \xrightarrow{\text{(i) LiAlH}_4/\text{ether}} \) \( \xrightarrow{\text{(ii) H}_2\text{O}} \) Product will be :-
   (1) R–CHO
   (2) R–CH\(_2\)–OH
   (3) R–CH\(_3\)
   (4) R–C–R

50. The volume of water which must be added to 40cc of 0.25 M oxalic acid solution to make it exactly decimolar (0.1 M) is :-
   (1) 40 cc
   (2) 30 cc
   (3) 60 cc
   (4) 25 cc

51. Which property decreases from left to right across the periodic table and increases from top to bottom ?
   (i) Atomic radius
   (ii) Electronegativity
   (iii) Ionisation energy
   (iv) Metallic character
   (1) (i) only
   (2) (i), (ii) and (iii)
   (3) (i), (iii) and (iv)
   (4) (i) and (iv)

52. Which of the following compounds is paramagnetic and coloured also :-
   (1) \( \text{K}_2\text{Cr}_2\text{O}_7 \)
   (2) \( \text{(NH}_3\text{)}_2 \text{[TiCl}_6\text{]} \)
   (3) \( \text{VOSO}_4 \)
   (4) \( \text{K}_3\text{[Cu(CN)]}_4 \)

53. The percentage of sulphur used in the vulcanization of rubber is :-
   (1) 3%
   (2) 5%
   (3) 30%
   (4) 55%

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Take it Easy and Make it Easy
54. In a set of reactions p-nitrotoluene yielded a product (D)

\[ \text{CH}_3 - \text{NO}_2 \rightarrow \text{Br} \quad \text{(Br)} \ EPtCl}_2 \rightarrow \text{Sn/HCl} \quad \text{NaNO}_2 \quad \text{HCl} \quad \text{HBr} \quad \text{CuBr} \rightarrow \text{D} \]

The product (D) would be:

(1) \[ \text{CH} - \text{Br} \]
(2) \[ \text{CH}_3 \text{Br} \]
(3) \[ \text{CH}_3 \text{Br} \text{Br} \]
(4) \[ \text{CH}_3 \text{Br} \text{Br} \]

55. In the given neutralization reaction the equivalent weight of acid and base are respectively:

\[ \text{H}_3\text{PO}_4 + 2\text{NaOH} \rightarrow \text{Na}_2\text{HPO}_4 + 2\text{H}_2\text{O} \]

(1) 98, 40
(2) 98, 20
(3) 49, 20
(4) 49, 40

56. Of the following isoelectronic & isostructural species are:

\( \text{NO}_3^- , \text{ClO}_3^- , \text{SO}_3^- \text{ & CO}_3^{2-} \)

(1) \( \text{NO}_3^- \text{ & CO}_3^{2-} \)
(2) \( \text{SO}_3^- \text{ & CO}_3^{2-} \)
(3) \( \text{NO}_3^- \text{ & ClO}_3^- \)
(4) \( \text{CO}_3^{2-} \text{ & ClO}_3^- \)

57. Which of the following coordination compound will produce four ions in solution:

(1) \[ \text{Pt (NH}_3)_2\text{Cl}_2 \]
(2) \[ \text{Pt (NH}_3)_2\text{Cl}_2 \text{Cl}_2 \]
(3) \[ \text{Pt (NH}_3)_3\text{Cl} \]
(4) \[ \text{Pt (NH}_3)_2\text{Cl}_2 \]

58. Which is correct about Saccharin:

(1) It is
(2) It is 550 time sweeter than sugar
(3) It is used as a sweetening agent
(4) All
59. Electron revolving in first orbit of hydrogen with uncertainty in its velocity is 0.1% then uncertainty in its position will be:

(1) $2.66 \times 10^{-8}$ cm  
(2) $2.66 \times 10^{-8}$ m  
(3) $2.66 \times 10^{-6}$ m  
(4) $2.66 \times 10^{-10}$ cm

60. The dissociation constant of acetic acid is $1.75 \times 10^{-5}$ and $\Lambda_{\text{CH}_3\text{COOH}} = 370.6 \times 10^{-4}$ mho m$^2$ mol$^-1$. The specific conductance of 0.01 molar acidic acid solution will be:

(1) $1.55 \times 10^{-4}$ Scm$^2$ mol$^-1$  
(2) $1.55 \times 10^{-5}$ Scm$^2$ mol$^-1$  
(3) $1.55 \times 10^{-6}$ Scm$^2$ mol$^-1$  
(4) $1.55 \times 10^{-8}$ Scm$^2$ mol$^-1$

61. Consider the following transformation

$$2\text{CuX}_2 \xrightarrow{\text{Room temp.}} 2\text{CuX} + \text{X}_2 \uparrow$$ Reducing agent

Then $X^-$ can be:

(1) $F^-$, $\Gamma$  
(2) $\text{Cl}^-$, $\text{Br}^-$  
(3) $\text{CN}^-$, $\Gamma$  
(4) $\text{Cl}^-$, $F^-$

62. Complex which show linkage isomerism is:

(1) $[\text{Co (en)}_3] \text{Cl}_3$  
(2) $[\text{Co (NH}_3)_6] [\text{CrCl}_6]$  
(3) $[\text{Co (en)}_2 \text{NO}_2 \text{Cl}] \text{Br}$  
(4) $[\text{Co (NH}_3)_5 \text{Cl}] \text{Br}$

63. The reagent needed for converting:

$$\text{Ph} = \text{C} \equiv \text{C} \equiv \text{Ph} \rightarrow \text{Ph} = \text{C} = \text{C} < \text{Ph}$$

(1) H$_2$/ Lindlar catalyst  
(2) Catalytic Hydrogenation  
(3) LiAlH$_4$  
(4) Na/Liquid NH$_3$

64. Consider the reactions:

(i) $2\text{CO}_2(g) + 2\text{H}_2(g) \rightleftharpoons 2\text{CO}(g) + 2\text{H}_2\text{O}(g) ; K_1$
(ii) $\text{CO}(g) + 3\text{H}_2(g) \rightleftharpoons \text{CH}_4(g) + 2\text{H}_2\text{O}(g) ; K_2$
(iii) $\text{CH}_4(g) + 2\text{H}_2\text{O}(g) \rightleftharpoons \text{CO}_2(g) + 4\text{H}_2(g) ; K_3$

Which of the following relation is correct:

(1) $K_3 = \frac{1}{\sqrt{K_1 \times K_2}}$  
(2) $K_3 = K_1 \times K_2$  
(3) $K_3 = K_2\sqrt{K_1}$  
(4) $K_3 = \frac{K_1}{K_2}$
65. Select the correct statement :-
(1) Schottky defect is shown by CsCl
(2) Frenkel defect is shown by ZnS
(3) hcp and ccp structures have the same
co-ordination number 12
(4) All of these

66. Which of the following statement is not correct:-
(1) Two bonded atoms can have more than three
bonds
(2) PH₄⁺ is having tetrahedral geometry with sp³
hybridisation of central atom.
(3) All diatomic molecules with polar bond have
dipole moment
(4) Four half filled hybrid orbitals of carbon form
same kind of bonds in CH₄

67. Pentaquacloro chromium (III) chloride
monohydrate complex has the formula :-
(1) [Cr(H₂O)₆]Cl₂
(2) [Cr(H₂O)₅Cl]Cl₂·H₂O
(3) [Cr(H₂O)₄Cl₂]Cl·2H₂O
(4) None

68. In which of the following benzene will not be
product :-
(1) Ph MgCl + H₂O⁰ →
(2) Ph – OH + Zn →
(3) Ph – COOH + (NaOH + CaO) →
(4) Ph–Cl + NaOH →

69. The hydrolysis constant for OCl⁻ is 3.0 × 10⁻⁷
then dissociation constant (Kₐ) for HOCI is :-
(1) 3.33 × 10⁻⁹
(2) 3.33 × 10⁻⁷
(3) 3.33 × 10⁻⁸
(4) 3.33 × 10⁻⁶

70. For a reaction for which the activation energies
of the forward and reverse directions are equal in value
then:-
(1) ΔG = 0
(2) ΔH = 0
(3) ΔS = 0
(4) The order is zero

71. A black sulphide ppt when treated with ozone
becomes white, the white compound is :-
(1) ZnSO₄ (2) CaSO₄ (3) BaSO₄ (4) PbSO₄
72. The IUPAC name of the given compound is :-

(1) N,N-Dimethyl cyclopropane carboxamide
(2) N-methyl cyclopropanamide
(3) Cyclopropionamide
(4) None of these

73. The concentration of a saturated solution of a certain polypeptide is $1.0 \times 10^{-3}$ M at 25°C. The osmotic pressure of this solution, in millimeter of mercury is:-
(1) 0.0245 (2) 0.760 (3) 18.6 (4) Can't predict

74. Which of the following lanthanide ion is paramagnetic ?
(1) La³⁺ (2) Ce⁴⁺ (3) Gd³⁺ (4) Lu³⁺

75. 100 mL, 0.1 M FCH₂COOH is mixed with 100 mL, 0.05 M BOH(strong base) then pH of resulting solution will be
(Kₐ for FCH₂COOH = 3 \times 10^{-5}) :-
(1) 5.48 (2) 4.52 (3) 6.3 (4) Can't predict

76. Which of the following lanthanide ion is paramagnetic ?
(1) La³⁺ (2) Ce⁴⁺ (3) Gd³⁺ (4) Lu³⁺

77. The given pair is :-

(1) Enantiomers
(2) Hamomers
(3) Constitutional isomers
(4) Diastercomers
78. In which of the following reaction intermediate is tetrahedral :-

(1) Esterification
(2) Lucas test of alcohol
(3) Dehydration of alcohol
(4) Williamson’s ether synthesis

79. Which of the following equation represent a reaction of enthalpy of formation as well as combustion :-

(1) \( C_{\text{graphite}} + \frac{1}{2} O_2 (g) \rightarrow CO (g) \)
(2) \( C_{\text{diamond}} + O_2 (g) \rightarrow CO_2 (g) \)
(3) \( C_{\text{diamond}} + \frac{1}{2} O_2 (g) \rightarrow CO (g) \)
(4) \( C_{\text{graphite}} + O_2 (g) \rightarrow CO_2 (g) \)

80. The vapour pressure of a given liquid will decrease if :-

(1) The liquid is moved to a container in which surface area is vary much smaller
(2) The volume of the vapour phase is decreased
(3) The volume of the vapour phase is increased
(4) Temperature is decreased

81. The nitrogen atom has no d-orbital in the valence shell and therefore cannot :-

(1) Form multiple bond
(2) Form hybridised orbital
(3) Exist in +5 oxidation stali
(4) Expend its covalency

82. Sum of \( \alpha \)-hydrogen in following compounds

I + II = ?

(1) 8 (2) 9 (3) 15 (4) 11

83. Methyl ketone can be oxidise using haloform reaction, the oxidised product [carboxylate ion] has :-

(1) 1 carbon more than methyl ketone
(2) 2 carbon more than methyl ketone
(3) 1 carbon less than methyl ketone
(4) 2 carbon less than methyl ketone
84. Which of the following set of compounds act as an oxidant only:
   (1) H₂SeO₄, H₃PO₃  (2) HIO₄, H₃BO₃
   (3) HClO₃, H₂SO₄  (4) B₂H₆, H₂S

85. The stabilization of the dispersed phase in a lyophobic sol is due to:
   (1) Liking of the dispersion medium
   (2) The surface tension of the medium
   (3) The formation of an electrical layer between the two phases
   (4) The viscosity of the medium

86. Point out dissimilarity in BeCl₂ and C₂H₂:
   (1) Hybridisation state of C and Be are same
   (2) Geometry of C₂H₂ and BeCl₂ is linear
   (3) The ratio [S : P] character in C and Be is same
   (4) These are only one bond of 180° in C₂H₂ and BeCl₂

87. Among the cyclic ions

   ![Cyclic Ions Diagram]

   the aromatic character is shown by:
   (1) P and S
   (2) Q and S
   (3) Q and R
   (4) P, Q, R and S

88. Formaldehyde can be distinguished from acetaldehyde by the use of:
   (1) L₂/alkali
   (2) Shiff's reagent
   (3) Tollens' reagent
   (4) Fehling's solution

89. The temperature at which real gases obey the ideal gas laws over a wide range of low pressure is called:
   (1) Inversion temperature
   (2) Critical temperature
   (3) Boyle temperature
   (4) Reduced temperature

90. In which following pair of complexes one of the complex gives white ppt with aqueous solution of BaCl₂?
   (1) [PtCl₂(NH₃)₂]Br₂ and [PtBr₂(NH₃)₄]Cl₂
   (2) [CoCl₂(NH₃)₂]NO₂ and [CoCl(NO₂)(NH₃)₃]Cl
   (3) [Co(NO₂)(NH₃)₂]Cl₂ and [Co(ONO)(NH₃)₃]Cl₂
   (4) [CoBr(NH₃)₃]SO₄ and [Co(SO₄)(NH₃)₃]Br
91. Match the column :-

<table>
<thead>
<tr>
<th>Column I</th>
<th>Column II</th>
<th>Column III</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Mutualism</td>
<td>(a) Lianas</td>
<td>(i) One partner is unaffected</td>
</tr>
<tr>
<td>(2) Commensalism</td>
<td>(b) Lichen</td>
<td>(ii) non obligatory</td>
</tr>
<tr>
<td>(3) Proto cooperation</td>
<td>(c) Hermit crab-sea Anemone</td>
<td>(iii) obligatory</td>
</tr>
</tbody>
</table>

(1) Only 1 (2) 1 and 2 (3) Only 3 (4) All are incorrect

92. UN conference of parties (COP) on climate change in 2015 was held at ?
(1) Doha (2) Durban (3) Lima (4) Paris

93. Read the following statements (A-D) carefully :-

[A] Genetic modification may improve tolerance to abiotic stress.
[C] Genetic modification helps to reduce in post-harvest losses.
[D] Genetic modification in animals provides facility to test vaccines before using on human.

How many of the above statements are correct ?
(1) A, B and C (2) A and B (3) A and D (4) All of the above

94. In glycolysis, pyruvic acid is formed :-
(1) Only when O₂ is available
(2) Only during aerobic respiration
(3) In both aerobic and anaerobic respiration
(4) When only glucose is used as substrate

95. In meiosis, crossing over and terminalization of chiasmata respectively occur in ?
(1) Pachytene & diplotene
(2) Pachytene & diakinesis
(3) Zygotene & pachytene
(4) Pachytene & zygotene

96. Class and stored food of brown algae is :-
(1) Phaeophyceae & Floridean starch
(2) Phaeophyceae & Starch
(3) Phaeophyceae & Mannitol
(4) Rhodophyceae & Floridean starch

97. Which of the following have zygomorphic flower ?
(1) Mustard, pea
(2) Gulmohar, chilli
(3) Cassia, bean
(4) Pea, datura
98. Which of the following groups of phylum show common body plan and symmetry?
   (1) Annelida and ctenophora
   (2) Coelenterata and flat worms
   (3) Annelida and arthropoda
   (4) Echinodermata and ctenophora

99. In the columns given below the differences between white and red muscles are mentioned. Find out the wrong one:

<table>
<thead>
<tr>
<th>A (Red muscles)</th>
<th>B (White muscles)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Myoglobin content high</td>
<td>Myoglobin content low</td>
</tr>
<tr>
<td>Blood vessels are more extensive</td>
<td>Blood vessels are less extensive</td>
</tr>
<tr>
<td>Contraction more powerful</td>
<td>Contraction less powerful</td>
</tr>
<tr>
<td>Fatigue occur slowly</td>
<td>Fatigue occur quickly</td>
</tr>
</tbody>
</table>

100. How many of the following actions of sympathetic nerves are present on the heart?
   (A) Increases heart beat.
   (B) Increases cardiac output.
   (C) Decrease the ventricular contraction.
   (D) Decrease cardiac output.
   (1) One (2) Two (3) Three (4) Four

101. It is best for growing crop, it contain 50% sand and 50% silt, it hold maximum water. Which kind of this soil is?
   (1) Sandy soil (2) Loamy soil
   (3) Silt soil (4) Laterite soil

102. Which of the following is correct equation for Verhulst-Pearl logistic growth?

\[
\frac{dN}{dt} = rN \left( \frac{N-K}{N} \right) \\
\frac{dt}{dN} = rN \left( \frac{K-N}{K} \right) \\
\frac{dN}{dt} = rN \left( \frac{K-N}{K} \right) \\
\frac{dt}{dN} = rN \left( \frac{K-N}{K} \right)
\]

103. Large holes in 'Swiss cheese' are due to the production of large amount of ............ :-
   (1) O₂ (2) CO₂
   (3) Ethanol (4) (2) & (3) both

98. निम्न नलिंक तमें से कौन सा स्थूल हो सकता है। रिक्यो जा स्मृति दर्शाएँः
   (1) एनिलिडा एंड क्ऱिनोरा
   (2) सीलेंटरा एंड फ्लैट वर्म्स
   (3) एनिलिडा एंड एर्थोपोडा
   (4) एचिनोडरम्स एंड क्ऱिनोरा

99. नीचे दिए गए तालिका में से ताल्स रक्त तपाशी के अंतर कौन सा है।

<table>
<thead>
<tr>
<th>A (रक्त तपाशी)</th>
<th>B (सीलेंटरा)</th>
</tr>
</thead>
<tbody>
<tr>
<td>मा दे लो बिना एंड लो बिन तो अधिक कम</td>
<td></td>
</tr>
<tr>
<td>रक्त तो हिका एंड रक्त तो हिका एक वढ़ता विस्तार करता</td>
<td></td>
</tr>
<tr>
<td>जय दा तो ब्रसें संयुक्त चन</td>
<td></td>
</tr>
<tr>
<td>धोरे बर धू बहू है तो है तीब ध्यान न हो तो न है</td>
<td></td>
</tr>
</tbody>
</table>

100. निम्न नलिंक तक वे ये से अनु कृपा टंग किरके के किसी सदर पर ये जुड़े हैः
   (A) हवाय दो का बढ़ा बढ़ा
   (B) का डिए फ्लॉट पूर्ट पुट का बढ़ा बढ़ा
   (C) निंदा संयुक्त चन के कम करता
   (D) वर में अट पूर्ट वे कम करता
   (1) दो (2) दो (3) तीन (4) चार

101. यह फसलें की बूढ़े सिक्के तिलादिया रात सिक्के पूर्व 50% सिक्के हो सकते है। इसमें कारण बनने की ज्यादा शायद है। का कौन से मूर्ता है?
   (1) संधी मूर्ता (2) लोमा मूर्ता
   (3) सिल्ट मूर्ता (4) लेटरिट मूर्ता

102. निम्न नलिंक तमें से कौन से हूं रेट - फां लाई जिर्ट है रक्त से कितना है?

\[
\frac{dN}{dt} = rN \left( \frac{N-K}{N} \right) \\
\frac{dt}{dN} = rN \left( \frac{K-N}{K} \right) \\
\frac{dN}{dt} = rN \left( \frac{K-N}{K} \right) \\
\frac{dt}{dN} = rN \left( \frac{K-N}{K} \right)
\]
104. Which of the following diagrams represents ATP synthesis in mitochondria through chemiosmosis?

1. \[ \begin{align*} 2H^+ & \rightarrow 2H^+ \\ O.C & \rightarrow \text{IM} \end{align*} \]

2. \[ \begin{align*} 2e^- & \rightarrow 2e^- \\ O.C & \rightarrow \text{IM} \end{align*} \]

3. \[ \begin{align*} 2H^+ & \rightarrow 2H^+ \\ O.C & \rightarrow \text{IM} \end{align*} \]

4. \[ \begin{align*} 2e^- & \rightarrow 2e^- \\ O.C & \rightarrow \text{IM} \end{align*} \]

105. If in a cell the amount of DNA is 2c in metaphase, then what will be the amount of DNA in anaphase, (x) in G1 phase (y) and after M-phase (z) ?

(1) (x) – 4c, (y) – c, (z) – c
(2) (x) – 2c, (y) – 2c, (z) – 4c
(3) (x) – 4c, (y) – 4c, (z) – 2c
(4) (x) – 2c, (y) – c, (z) – c

106. Which of the following statement is incorrect for DNA?

(1) DNA is a long polymer of deoxyribonucleoside monophosphate.
(2) A bacteriophage known as \( \phi \times 174 \) has 5386 base pair.
(3) Haploid content of human DNA is \( 3.3 \times 10^9 \) bp.
(4) 5-methyl-uracil nitrogenous base present in DNA.
107. Which of the following match is correct?
(A) Endarch – Protoxylem toward the centre & metaxylem toward the periphery eq. stem & root
(B) Exarch – Metaxylem towards centre & protoxylem toward the periphery eq. root
(C) Xylem parenchyma – Consists of living cells and have lignified cell wall
(D) Tracheids – Cell are dead and without protoplasm

108. Which of the following animal show monocondylic skull:
(1) Frog
(2) Birds
(3) Mammals
(4) Rabbit

109. Consider the following four statements (a-d) and select the one which includes all incorrect ones:
(a) The essence of Darwinian theory of evolution is natural selection.
(b) Evolution is directed process in sense of determinism.
(c) The geological history of earth is not related with biological history of earth.
(d) During evolution the rate of appearance of new forms is linked with the life cycle.

Options:
(1) a and b
(2) b and c
(3) a and d
(4) b and d

110. How many of the following is/are not correct about pneumonia:
(A) It is caused by Salmonella typhi.
(B) Symptoms of pneumonia include fever with chills, cough and headache.
(C) Infect alveoli of lungs.
(D) In severe cases intestinal perforation may occur.

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

111. On the basis of following diagram most of the geographical region of India must be included in?

```
(1) C
(2) A
(3) B
(4) D
```
112. Which of the following sentence is incorrect about multiple alleles?
   (1) Multiple alleles can be found in population study
   (2) Multiple alleles are formed by mutation
   (3) In multiple allele system, a pollen grain has several alleles for a gene
   (4) Multiple alleles are present at the same locus of a pair of homologous chromosomes

113. A colourblind man has a colourblind sister, but a normal brother then his mother and father would be:
   (1) Both are colour blind
   (2) Father normal but mother colourblind
   (3) Father normal but mother carrier
   (4) Father colour blind but mother carrier

114. Which relationship is considered correct for a solution at atmospheric pressure?
   (1) \( \psi_W = \psi_S + \psi_P \)
   (2) \( \psi_W = \psi_S \)
   (3) \( \psi_W = \psi_P \)
   (4) \( \psi_W = \psi_S - \psi_P \)

115. Archaebacteria are differ from other bacteria because:
   (1) They have cellulose cell wall
   (2) They have nucleus
   (3) They have different cell wall structure from other bacteria
   (4) They are not found in salty areas

116. Which of the following is the most abundant protein in the whole of the biosphere?
   (1) Collagen protein
   (2) Actin protein
   (3) Albumin protein
   (4) Rubisco protein

117. More distinct and clear annual rings are formed in temperate region plants, because:
   (1) Climatic variation and temperature variation are not sharp.
   (2) Temperature variations are sharp.
   (3) Climate remains the same throughout the year.
   (4) Climatic variations are sharp.

118. Which of the following formula can be used to find a value of vital capacity of lungs:
   (1) \( IRV + ERV + TV \)
   (2) \( IC + ERV \)
   (3) \( EC + IRV \)
   (4) All of the above are correct
119. Identify the type of natural selection shown below as well as related right environment in which this type of natural selection occurs:

![Peak shift in one direction]

<table>
<thead>
<tr>
<th>Type of natural selection</th>
<th>Type of environment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Balancing</td>
<td>Constant environment</td>
</tr>
<tr>
<td>Directional</td>
<td>Continuous changing environment</td>
</tr>
<tr>
<td>Disruptive</td>
<td>Constant environment</td>
</tr>
<tr>
<td>Stablizing</td>
<td>Constant environment</td>
</tr>
</tbody>
</table>

120. Purpose of Immunisation is:
(1) Formation of Immunological memory
(2) Strengthening innate Immunity
(3) Promotion of phagocytosis
(4) Activation of complementary system

121. Match the items of column I with column II and select the correct option:

<table>
<thead>
<tr>
<th>Column I</th>
<th>Column II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrostatic precipitator</td>
<td>Removes gases like SO₂</td>
</tr>
<tr>
<td>Scrubber</td>
<td>Reduces automobile emission</td>
</tr>
<tr>
<td>Catalytic converter</td>
<td>Removes particulate matter</td>
</tr>
</tbody>
</table>

(A) Electrostatic precipitator
(B) Scrubber
(C) Catalytic converter

(1) A – 2, B – 3, C – 1
(2) A – 3, B – 2, C – 1
(3) A – 1, B – 2, C – 3
(4) A – 3, B – 1, C – 2
122. Which of the following gene can affect its inheritance in condition of a reciprocal cross:

(1) Plastid gene in *Mirabilis jalapa*
(2) ABO blood group gene
(3) Gene for shape of seed in pea plant
(4) Lethal gene in mice

123. A man with pure black hair & blue eyes marries a woman with red hairs & pure black eyes. (Black hairs are dominant over red hairs and black eyes over blue eyes). What will be the probabilities of phenotypes of the children?

(1) 50% with black hairs & black eyes and 50% with black hairs & blue eyes
(2) All will be with black eyes and black hairs
(3) Both the above cases may be possible
(4) 1 : 1 : 1 : 1

124. Gutttation is most commonly observed under condition of?

(1) High atmospheric humidity and plentiful soil water
(2) Low atmospheric humidity and little soil water
(3) High atmospheric humidity and little soil water
(4) Low atmospheric humidity and plentiful soil water

125. Gemmae are:

(1) Colourless, unicellular and asexual buds.
(2) Green, multicellular and sexual buds.
(3) Green, multicellular and asexual buds.
(4) Green, unicellular and asexual buds.

126. Which of the following is an example of saturated fatty acid?

(1) Palmitic acid
(2) Oleic acid
(3) Linoleic acid
(4) Arachidonic acid

127. Bones have a hard and non pliable ground substance rich in (a) salts and (b) fibres:

(1) (a) Magnesium (b) Elastin
(2) (a) Calcium (b) Collagen
(3) (a) Phosphorous (b) Reticulin
(4) (a) Calcium (b) Elastin
Above shown graph represents oxyhaemoglobin dissociation curve. Find out the incorrect option related to graph:

1) Shifting of B graph to C place is due to low CO₂ conc. and high pH value
2) If B graph represents adult Hb then C graph may be for fetal Hb
3) Affinity of Hb for O₂ is more for curve B as compared to curve A
4) P₅₀ value will be more for graph C than graph A

Represented below is a type of evolution in organisms which type of evolution is an example of this pattern:

(1) Convergent evolution
(2) Divergent evolution
(3) Retractive evolution
(4) Quantum evolution

Which is not a secondary lymphoid organ:

(1) Thymus
(2) Spleen
(3) Appendix
(4) MALT

Brood parasitism is very well explained by:

(1) Bacteriophage
(2) Egg laying of cuckoo
(3) Egg laying of crow
(4) All of the above
132. Two genes R and Y are located very close on the chromosomal linkage map of maize plant. When RRYY and rryy genotypes are hybridized, the F2 will show:
(1) Higher number of the parental types
(2) Higher number of the recombinant types
(3) Segregation in the expected 9 : 3 : 3 : 1 ratio
(4) Segregation in 3 : 1 ratio

133. Find out the genotype of father and mother in the given pedigree chart:

```
Mother Father
(1) A A A A
(2) A a A a
(3) A A a a
(4) a a A a
```

134. Find out the incorrect match of column I with column II:

<table>
<thead>
<tr>
<th>Column I</th>
<th>Column II</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Mg</td>
<td>Structural component of chlorophyll</td>
</tr>
<tr>
<td>2 S</td>
<td>Found in some amino acid</td>
</tr>
<tr>
<td>3 I</td>
<td>Important for plants</td>
</tr>
<tr>
<td>4 Mn</td>
<td>Photolysis of water</td>
</tr>
</tbody>
</table>

135. Imperfect fungi is:
(1) Basidiomycetes
(2) Deuteromycetes
(3) Ascomycetes
(4) Phycomycetes

136. Select the incorrect statement:
(1) In a normal flower, which opens and expose the anthers and stigmas complete autogamy is rather rare.
(2) An ovule generally has a single embryo sac.
(3) Hilum is the junction of funicle and body of ovule.
(4) Polar nuclei are situated above the egg apparatus in a ovule.
137. Match the list I with list II and find the correct option :-

<table>
<thead>
<tr>
<th>List-I [Epithelial tissue]</th>
<th>List II [Location]</th>
</tr>
</thead>
<tbody>
<tr>
<td>(A) Cuboidal</td>
<td>(i) Epidermis of skin</td>
</tr>
<tr>
<td>(B) Ciliated</td>
<td>(ii) Inner lining of blood vessels</td>
</tr>
<tr>
<td>(C) Columnar</td>
<td>(iii) Inner surface of gall bladder</td>
</tr>
<tr>
<td>(D) Squamous</td>
<td>(iv) Inner lining of fallopian tube</td>
</tr>
<tr>
<td>(E) Keratinized squamous</td>
<td>(v) Lining of pancreatic duct</td>
</tr>
</tbody>
</table>

(1) A-v, B-iv, C-ii, D-iii, E-i  
(2) A-iii, B-iv, C-v, D-ii, E-i  
(3) A-v, B-iv, C-iii, D-ii, E-i  
(4) A-iii, B-iv, C-v, D-i, E-ii

138. Read the following statements and count the numbers of wrong statements :-
(1) During joint diastole semilunar valves are closed.
(2) During arterial systole the blood flow into the ventricle increases by about 30%.
(3) During joint systole AV valves are closed.
(4) Atrial phases are 0.3 sec later than the ventricular phases in a cardiac cycle.
(5) The cardiac output can be defined as the volume of blood pumped out by heart in each beat and average 5 liter in a healthy individual.

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

139. The inner ear contains a complex system located above the cochlea is A it is influenced by gravity and movements and helps us in B :-
(1) Organ of corti, Hearing  
(2) Organ of corti, Maintaining balance  
(3) Vestibular apparatus, Maintaining balance  
(4) Eustachian tube, Hearing

140. How many of these drugs are obtained from plant:-Cocaine, Morphine, Amphetamine, Cannabinoids, LSD, Datura.
Options :-
(1) Three  (2) Four  (3) Five  (4) Six
141. Birds → Parasites

In above food chain energy transfer from tree to birds and from birds to parasites than what will be the shape of energy pyramid in this food chain?

(1) Inverted pyramid
(2) Upright pyramid
(3) Spindle shape pyramid
(4) None of the above

142. In lac operon, which of the following gene function as constitutive gene and its product is available continuously?

(1) Lac z gene (2) Lac i gene
(3) Promotor gene (4) Operator gene

143. Somatic hybridization is :-

(1) Fusion of male and female nucleus in a zygote
(2) Vegetation reproduction
(3) Fusion of two protoplast
(4) Sexual reproduction

144. (i) Promotes flowering in pineapple.
(ii) Used to prepare weed free lawn.
(iii) Promote the abscission of older leaves

The above function are carried out by :-

(1) GA (2) C₂H₄
(3) ABA (4) Auxin

145. Which is known as peat moss?

(1) Sphagnum (2) Selaginella
(3) Marchantia (4) Selvinia

146. A safe place for laying eggs act as floral rewards in some plant/plants of angiosperms like :-

(1) Yucca (2) Amorphophallus
(3) Ficus (4) All of them

147. In female cockroach, ootheca is secreted by :-

(1) Oothecal chamber (2) Oviduct
(3) Collateral gland (4) Mushroom gland

148. Find out the incorrect statement about E.C.G. :-

(1) P wave represents the electrical excitation of the atria
(2) QRS complex represents the depolarization of the ventricle
(3) End of T wave represents the end of joint diastole
(4) By counting the number of QRS complexes that occur in a given time period any body can count the rate of heart beat

Time Management is Life Management
149. Which of the following hormone in body does not affect erythropoiesis :-
(1) Cortisol
(2) Thyroxine
(3) Erythropoietin
(4) ADH

150. (A) [ove feed back
Hypothalamus
(B) Anterior pituitary
(C) Stimulates
(D) Ovulation

Identify (A), (B), (C) and (D) hormones and select correct option :-

A B C D
(1) Progesterone GnRh LH FSH
(2) Estrogen GnRh LH FSH
(3) Progesterone LH FSH GnRh
(4) Estrogen GnRh FSH LH

151. Which one of the following ecosystem has the highest primary productivity ?
(1) Pond ecosystem
(2) Lake ecosystem
(3) Grassland ecosystem
(4) Forest ecosystem

152. At a particular locus, frequency of 'A' allele is 0.6 and that of 'a' is 0.4. What would be the frequency of heterozygotes in a random mating population at equilibrium ?
(1) 0.24
(2) 0.16
(3) 0.48
(4) 0.36

153. During anther culture, mature anthers are utilized for plant production. These anthers can also be referred as :-
(1) Haploid plants
(2) Explant
(3) Somatic embryo
(4) Cybrid
154. Read the following statements :-
   (i) Each chromatid consists of DNA (long thread like) & histone
   (ii) All secondary constrictions are called as NOR
   (iii) In satellite region, only thymine base is absent
   (iv) Telomere avoid joining of one chromosome to other
Identify incorrect statements :-
(1) i, ii, iii (2) i, ii
(3) ii, iii (4) ii, iii, iv

155. Which of the following has more similarities in characters than family ?
(1) Genus (2) Order
(3) Class (4) Division

156. Which of following structure play role in guiding the pollen-tube in to embryosac ?
(1) Obturators (2) Filliform apparatus
(3) Polar nuclei (4) Antipodal cells

157. The best breeding method for animals that are below average in productivity in milk production and growth rate in beef cattle :-
(1) Inbreeding (2) Interspecific hybridization
(3) Out crossing (4) Cross breeding

158. Match the columns :-

<table>
<thead>
<tr>
<th>Column A</th>
<th>Column B</th>
</tr>
</thead>
<tbody>
<tr>
<td>i Accumulation of urea in blood</td>
<td>a Glomerulonephritis</td>
</tr>
<tr>
<td>ii Kidney transplantation</td>
<td>b Renal stone</td>
</tr>
<tr>
<td>iii Oxalates in kidney</td>
<td>c Uraemia</td>
</tr>
<tr>
<td>iv Inflammation of glomerulus</td>
<td>d Renal failure</td>
</tr>
</tbody>
</table>

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

159. The class of adrenal gland hormones which are related with alertness, piloerection and more glucose level in blood is :-
(1) Glucocorticoids (2) Catecholamines
(3) Mineralocorticoids (4) Gonadocorticoids

154. निम्नलिखित कथा नां के च्छन्नसे पिछला हो ए -
(i) प्रत्ये कवम में रिहाई, रिहाईDNA केवल तक वे बाता में से विस्तार होता है।
(ii) संबंधित दिति कस्मे फिक्ना के का निरक्त संगठन का लाभ (NOR) चरित्रहै।
(iii)सेटां लाएं भाइ गएं के बल भाइ इमों न भाइ रक्त नहीं।
(iv)दो मौली यथा फ्रूट सूत्रों को दूर से गुण सूत्र से धिककर रोक जाता है।
अतः चार न प्रचार निये
(1) i, ii, iii (2) i, ii
(3) ii, iii (4) ii, iii, iv

155. निम्नलिखित तात्त्व में कस्म कुल की तुलना में गुण पें में ओप क्रमशः नत रहते हैं?
(1) वं (2) गण
(3) वर्ग (4) संघ

156. एलएं ए के गण में पुष्प गन्धलिखित किस्मत के निर्देश प्रियत तकलीफ़ में निम्न में से किस काम सर्वोच्च व गुण पें होते हैं?
(1) अटट, रेटर (2) फु तु माइ क्रम
(3) प्र, विय के - रेंट्र (4) प्र कित्र्य त क्षण किस के ऐसे

157. ऐसे पुष्प, जिसकी दुर र धुर प दन संग्रह तक अगर खीं यो के दर से कम होते हैं के लिए खास अवधित्र अणु विधि हैं?
(1) अंतः अणु (2) अंतः विश्लेषण संघ
(3) वहांसे संघ (4) संघ

158. राकां से मिला न को?

<table>
<thead>
<tr>
<th>तालिका A</th>
<th>तालिका B</th>
</tr>
</thead>
<tbody>
<tr>
<td>i युरिया की रक्त पर aर्लों में रक्त ने प्रोटाइट स में ओप रक्त</td>
<td></td>
</tr>
<tr>
<td>ii वुंबक कर्क bवुंबक कर्क पर aर रूस पा</td>
<td></td>
</tr>
<tr>
<td>iii वुंबक कर्क cवुंबक कर्क पर आर सेलेट</td>
<td></td>
</tr>
<tr>
<td>iv र लें में फसल dर नल फसल रे बिँच</td>
<td></td>
</tr>
</tbody>
</table>

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

159. इन निम्नलिखित कथा के च्छन्नसे भाइ न का वर्ग जो कि ब्राह्मण उपर जां रक्त में वर्कर के रूप के बड़े और रूप ने हैं? के
(1) र पूरे का विप वाला इलाके के लाइन के वर्ग के वर्कर के रूप के बड़े और रूप ने हैं?
(2) खुल के किं र वाला इलाके के लाइन के वर्कर के रूप के बड़े और रूप ने हैं?
(3) मिति के की रंग के वाला इलाके के वर्कर के रूप के बड़े और रूप ने हैं?
160. What is the similarity between secondary oocyte and polar bodies:
(1) Volume of cytoplasm
(2) Size of cell
(3) Number of chromosomes
(4) Both (1) and (3)

161. Match the following column-I with column-II?

<table>
<thead>
<tr>
<th>Column - I</th>
<th>Column - II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pyramid of number represents</td>
<td>(i) Standing crop</td>
</tr>
<tr>
<td>Pyramid of biomass represents</td>
<td>(ii) Productivity</td>
</tr>
<tr>
<td>Pyramid of energy represents</td>
<td>(iii) Biotic potential</td>
</tr>
</tbody>
</table>

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

162. During 'Blue-White Colony' selection, blue colored colonies present in chromogenic substrate containing medium indicate:
(1) Transformed but non-recombinant
(2) Transformed but recombinant
(3) Non-transformed but recombinant
(4) Non-transformed but non-recombinant

163. Which of the following option are correct regarding colour of pigments in chromatogram?

<table>
<thead>
<tr>
<th>Chl-a</th>
<th>Chl-b</th>
<th>Xanthophyll</th>
<th>Carotenoids</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yellow orange</td>
<td>Yellow</td>
<td>Yellow green</td>
<td>Blue green</td>
</tr>
<tr>
<td>Blue green</td>
<td>Yellow green</td>
<td>Yellow orange</td>
<td>Only yellow</td>
</tr>
<tr>
<td>Yellow green</td>
<td>Yellow</td>
<td>Yellow orange</td>
<td>Blue green</td>
</tr>
<tr>
<td>Blue green</td>
<td>Yellow green</td>
<td>Yellow</td>
<td>Yellow to yellow orange</td>
</tr>
</tbody>
</table>

160. द्वितीय औग्य में वे चौथे औग्य में के बीच में कह सकते हैं:
(1) बैंस, बौछार में अनोखा
(2) बैंस, बौछार अक्सर
(3) गुना पुनर्जन्म की संख्या
(4) (1) और (3) दो नहीं

161. नीचे दिए गए ज्वा का रक्त-प्रभाव मिला न किये थे?

<table>
<thead>
<tr>
<th>Column - I</th>
<th>Column - II</th>
</tr>
</thead>
<tbody>
<tr>
<td>संख्या का पिस्सा मिड दर दाँत तकता है</td>
<td>(i) ख, द, फ, कस</td>
</tr>
<tr>
<td>क्रम चौथे औग्य में पिस्सा मिड दर दाँत तकता है</td>
<td>(ii) उ, ट, प दक्ष</td>
</tr>
<tr>
<td>क्रम चौथे औग्य में पिस्सा मिड दर दाँत तकता है</td>
<td>(iii) ज, चिक, विधा व</td>
</tr>
</tbody>
</table>

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

162. नीचे दिए गए ज्वा के दू-डू न नीचे गए रंग की बाल के बीच में जेनिका फॉर्म न व तमा ध्यम में उ रेंट हात करते हैं:
(1) ट, ट-फार, मिंट-ट, सफँ-स, तु-ए न सिके के न (2) ट, ट-फार, मिंट-ट, सफँ-स, तु-ए न सिके के न
(3) न-ट, ट-फार, मिंट-ट, सफँ-स, तु-ए न सिके के न
(4) न-ट, ट-फार, मिंट-ट, सफँ-स, तु-ए न सिके के न

163. अंग में टे-गा में वर्ण के रंग के संदर्भ में कौन सी चिल्ल पड़े?
164. Identify A, B, C in following fig. :-

![Diagram](image)

Options :-

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Central bridge</td>
<td>Dyenin</td>
<td>Actin</td>
</tr>
<tr>
<td>2</td>
<td>Central sheath</td>
<td>B Microtubule</td>
<td>Tubulin</td>
</tr>
<tr>
<td>3</td>
<td>Central sheath</td>
<td>A Microtubule</td>
<td>Dyenin</td>
</tr>
<tr>
<td>4</td>
<td>Central bridge</td>
<td>A Microtubule</td>
<td>Dyenin</td>
</tr>
</tbody>
</table>

165. Which of the following statements are true about Laminaria (kelps) ?

(A) It is a rich source of iodine.
(B) Body divided into hold fast, stipe and lamina.
(C) Has pear shaped male gametes.
(D) Exhibits haplontic life cycle.
(E) Stored food is floridean starch.

Select the correct option:


166. Underground stem store food in all the following except ?

(1) Zaminkand (2) Colocasia
(3) Ginger (4) Sugarcane

167. Correctly match the column A with column B :-

<table>
<thead>
<tr>
<th>Column A</th>
<th></th>
<th>Column B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radula</td>
<td>a</td>
<td>Bony fishes</td>
</tr>
<tr>
<td>Air bladder</td>
<td>b</td>
<td>Coelenterates</td>
</tr>
<tr>
<td>Corals</td>
<td>c</td>
<td>Ctenophora</td>
</tr>
<tr>
<td>Comb plates</td>
<td>d</td>
<td>Mollusca</td>
</tr>
</tbody>
</table>

Select the correct option:

(1) 1-a, 2-b, 3-c, 4-d (2) 1-d, 2-b, 3-a, 4-c (3) 1-d, 2-a, 3-c, 4-b (4) 1-d, 2-a, 3-b, 4-c
168. Find out the incorrect match :-

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>Kidneys</td>
<td>Urea</td>
</tr>
<tr>
<td>(2)</td>
<td>Skin</td>
<td>Sweat</td>
</tr>
<tr>
<td>(3)</td>
<td>Lungs</td>
<td>CO₂</td>
</tr>
<tr>
<td>(4)</td>
<td>Liver</td>
<td>Bile</td>
</tr>
</tbody>
</table>

169. In given graph different points are labelled according to voltage and time. Identify them and give answers of following statements :-

(i) At which point all –ve are cancelled by +ve during Na⁺ influx.
(ii) Where K⁺VGC opening is not possible.
(iii) Na⁺–K⁺ pump is closed between.
(iv) At which point K⁺VGC starts opening.

(1) b c d-e f 
(2) c b g-d d 
(3) e c b-d d 
(4) c b g-d b 

170. Which one of the following is an incorrect match:-

(1) Lactational amenorrhoea - Natural centraception method
(2) Saheli – Steroidal pills
(3) Lippes loop – Non medicated IUCD
(4) Test tube baby – In vitro fertilization

171. According to Robert May global species diversity is about :-

(1) more than 1.5 million
(2) 7 billion
(3) 7 million
(4) 7.5 million
172. Manipulation of DNA in genetic engineering became possible due to the discovery of :-
(1) Restriction endonuclease
(2) DNA ligase
(3) Transcriptase
(4) Primase

173. How many of the following are associated with light reaction ?
(i) Light Absorption
(ii) ATP and NADPH+H formation
(iii) Water splitting
(iv) Regeneration of CO₂ acceptor
(v) Oxidation of NADPH+H
(vi) Oxygen release
(1) Four (2) One (3) Two (4) Three

174. Arrange the following cell organelles on the basis of their size :-
(A) Chloroplast (B) Ribosome (C) Lysosome (D) Nucleus
Options :-
(1) D > A > C > B (2) C > D > B > A
(3) A > D > C > B (4) D > A > B > C

175. Green algae usually have a rigid cell wall made up of an outer layer of :-
(1) Cellulose (2) Pectose (3) Lignin (4) Hemicellulose

176. Mustard and groundnut are :-
(1) Dry fruits (2) Fleshy fruits (3) Dry and dehiscent fruits (4) Fleshy and dehiscent fruits

177. Figures of some animals are given below -

Which one of the following is incorrect for the above figure ?
(1) A-has 6-15 pairs gill slits (2) B-has air bladder (3) C-has 4 pairs of gills (4) B-has placoid scales
178. Identify the correct labelling:
(1) A-Tropomyosin, B-Troponin, C-F-actin
(2) A-F-actin, B-Troponin, C-Tropomyosin
(3) A-Troponin, B-Tropomyosin, C-F-actin
(4) A-F-actin, B-Tropomyosin, C-Troponin

179. Maximum digestion of food occurs in A and maximum absorption occurs in B, the part of intestine
(1) Ileum, Jejunum (2) Jejunum, Duodenum
(3) Duodenum, Jejunum (4) Ileum, Duodenum

180. Match column I and column II:

<table>
<thead>
<tr>
<th>Column I</th>
<th>Column II</th>
</tr>
</thead>
<tbody>
<tr>
<td>(A) Bile juice</td>
<td>(i) Nuclease</td>
</tr>
<tr>
<td>(B) Saliva</td>
<td>(ii) Aminopeptidase</td>
</tr>
<tr>
<td>(C) Pancreatic juice</td>
<td>(iii) Ptyalin</td>
</tr>
<tr>
<td>(D) Succus entericus</td>
<td>(iv) Na-glycholate</td>
</tr>
</tbody>
</table>

and choose correct option:
(1) A-iv, B-iii, C-i, D-ii
(2) A-iii, B-iv, C-i, D-ii
(3) A-iv, B-ii, C-i, D-iii
(4) A-iv, B-iii, C-ii, D-i
## CORRECTION IN MAJOR TEST

<table>
<thead>
<tr>
<th>Test Date</th>
<th>PHASE</th>
<th>Q.</th>
<th>150</th>
<th>176</th>
</tr>
</thead>
<tbody>
<tr>
<td>22.02.2016</td>
<td>MLA,MLB,MLC,MLD,MLE</td>
<td>A.</td>
<td>Bonus</td>
<td>Bonus</td>
</tr>
<tr>
<td>29.02.2016</td>
<td>MLA,MLB,MLC,MLD,MLE</td>
<td>Q.</td>
<td>44</td>
<td>169</td>
</tr>
<tr>
<td>08.03.2016</td>
<td>MLF,MLG,MLH,MAZA,MAZB</td>
<td>A.</td>
<td>Bonus</td>
<td>2 H</td>
</tr>
<tr>
<td>14.03.2016</td>
<td>MLI,MLJ,MAZC</td>
<td>Q.</td>
<td>74</td>
<td>127</td>
</tr>
<tr>
<td>15.03.2016</td>
<td>MLA,MLB,MLC,MLD,MLE</td>
<td>Q.</td>
<td>11</td>
<td>42</td>
</tr>
<tr>
<td>20.03.2016</td>
<td>MLI,MLJ,MAZC</td>
<td>Q.</td>
<td>81</td>
<td></td>
</tr>
<tr>
<td>22.03.2016</td>
<td>MLA,MLB,MLC,MLD,MLE</td>
<td>Q.</td>
<td>147</td>
<td></td>
</tr>
<tr>
<td>22.03.2016</td>
<td>MLF,MLG,MLH,MAZA,MAZB</td>
<td>Q.</td>
<td>45</td>
<td>173</td>
</tr>
<tr>
<td>26.03.2016</td>
<td>MLK,MLSP,MAZD</td>
<td>Q.</td>
<td>162</td>
<td></td>
</tr>
<tr>
<td>26.03.2016</td>
<td>MLI,MLJ,MAZC</td>
<td>Q.</td>
<td>15</td>
<td>121</td>
</tr>
<tr>
<td>29.03.2016</td>
<td>All Enthuse,MLM,N,P,MAZE,F,G,H,I</td>
<td>Q.</td>
<td>57</td>
<td>81</td>
</tr>
<tr>
<td>30.03.2016</td>
<td>MLF,G,H,I,MAZA,MAZB,MAZC</td>
<td>Q.</td>
<td>54</td>
<td>102</td>
</tr>
<tr>
<td>30.03.2016</td>
<td>MLA,MLB,MLC,MLD,MLE</td>
<td>Q.</td>
<td>106</td>
<td></td>
</tr>
<tr>
<td>03.04.2016</td>
<td>All Enthuse,MLK,MLSP,MLM,N,P,Q,MAZD,E,F,G,HJ</td>
<td>Q.</td>
<td>10</td>
<td>71</td>
</tr>
<tr>
<td>07.04.2016</td>
<td>MLA,B,C,D,E,F,G,H,I,MAZA,B,C</td>
<td>Q.</td>
<td>2</td>
<td>81</td>
</tr>
<tr>
<td>11.04.2016</td>
<td>All Enthuse,MLK,MLSP,MLM,N,P,Q,MAZD,E,F,G,HJ</td>
<td>Q.</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>17.04.2016</td>
<td>All India Open Test (Enthuse, Leader &amp; Achiever)</td>
<td>Q.</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>07.04.2016</td>
<td>All Enthuse,MLK,MLSP,MLM,N,P,Q,MAZD,E,F,G,HJ</td>
<td>Q.</td>
<td>105</td>
<td>116</td>
</tr>
<tr>
<td>11.04.2016</td>
<td>All Enthuse,MLK,MLSP,MLM,N,P,Q,MAZD,E,F,G,HJ</td>
<td>Q.</td>
<td>83</td>
<td></td>
</tr>
<tr>
<td>17.04.2016</td>
<td>All India Open Test (Enthuse, Leader &amp; Achiever)</td>
<td>Q.</td>
<td>2</td>
<td>Bonus</td>
</tr>
</tbody>
</table>