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.

Your Target is to secure Good Rank in Pre-Medical 2016

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1. The transition from the state \( n = 3 \) to \( n = 1 \) in a hydrogen-like atom results in ultraviolet radiation. Infrared radiation will be obtained in the transition from:
   (1) \( 4 \rightarrow 2 \)  
   (2) \( 4 \rightarrow 3 \)  
   (3) \( 2 \rightarrow 1 \)  
   (4) \( 3 \rightarrow 2 \)

2. For transistor in action region:
   (a) Base, emitter and collector regions should have similar size and doping concentrations
   (b) The base region must be very thin and lightly doped
   (c) The emitter-base junction is forward biased and base-collector junction is reverse biased
   (d) Both the emitter-base junction as well as the base-collector junction are forward biased.

Which one of the following pairs of statements is correct?
   (1) (a), (b)  
   (2) (b), (c)  
   (3) (c), (d)  
   (4) (d), (a)

3. If a bimetallic strip is heated, it will:
   (1) Bend towards the metal with lower linear thermal expansion coefficient
   (2) Bend towards the metal with higher linear thermal expansion coefficient
   (3) Not bend at all
   (4) None

4. Two charges \( q_1 \) and \( q_2 \) are placed 30 cm apart, as shown in the figure. A third charge \( q_3 \) is moved along the arc of a circle of radius 40 cm from C to D. The change in the potential energy of the system is \( \frac{q_3}{4 \pi \varepsilon_0} k \), where \( k \) is:

   (1) \( 8q_2 \)  
   (2) \( 6q_2 \)  
   (3) \( 8q_1 \)  
   (4) \( 6q_1 \)
5. The vector sum of two forces is perpendicular to their vector differences. In that case, the forces:
(1) Are equal to each other.
(2) Are equal to each other in magnitude.
(3) Are not equal to each other in magnitude.
(4) Cannot be predicted.

6. The half life of a radioactive nucleus is 50 days. The time interval \((t_2 - t_1)\) between the time \(t_2\) when \(\frac{2}{3}\) of it has decayed and the time \(t_1\) when \(\frac{1}{3}\) of it had decayed is:
(1) 60 days  (2) 15 days  (3) 30 days  (4) 50 days

7. The following figure shows a logic gate circuit with two inputs A and B and the output Y. The voltage waveforms of A, B, and Y are as given:

![Logic Gate Circuit Diagram]

The logic gate is:
(1) OR  (2) AND  (3) NAND  (4) NOR

8. A particle executes simple harmonic oscillation with an amplitude \(a\). The period of oscillation is \(T\). The minimum time taken by the particle to travel half of the amplitude from the equilibrium position is:
(1) \(T/2\)  (2) \(T/4\)  (3) \(T/8\)  (4) \(T/12\)

9. An electron moves in a circular orbit with a uniform speed \(v\). It produces a magnetic field \(B\) at the centre of the circle. The radius of the circle is proportional to:
(1) \(\sqrt{\frac{v}{B}}\)  (2) \(\frac{v}{B}\)  (3) \(\frac{B}{v}\)  (4) \(\sqrt{\frac{B}{v}}\)

10. An observer moves towards a stationary source of sound with a speed \(1/5\)th of the speed of sound. The wavelength and frequency of the source emitted are \(\lambda\) and \(f\) respectively. The apparent frequency and wavelength recorded by the observer are respectively:
(1) 1.2f, 1.2\(\lambda\)  (2) 1.2f, \(\lambda\)  (3) \(f\), 1.2\(\lambda\)  (4) 0.8f, 0.8\(\lambda\)
11. A truck travelling due north at 20m/s turns west and travels at the same speed. The change in velocity will be:-

(1) 40m/s N-W  (2) $20\sqrt{2}$ m/s N-W
(3) 40m/s S-W  (4) $20\sqrt{2}$ m/s S-W

12. (a) Centre of gravity (C.G.) of a body is the point at which the weight of the body acts.
(b) Centre of mass coincides with the centre of gravity if the earth is assumed to have infinitely large radius.
(c) To evaluate the gravitational field intensity due to any body at an external point, the entire mass of the body can be considered to be concentrated at its C.G.
(d) The radius of gyration of any body rotating about an axis is the length of the perpendicular dropped from the C.G. of the body to the axis of rotation.

Which one of the following pairs of statements is correct?
(1) (a) and (b)  (2) (b) and (c)
(3) (c) and (d)  (4) (d) and (a)

13. Two batteries and two condensers are connected as shown in the figure. The charge on 2 µF capacitor is:-

<table>
<thead>
<tr>
<th>18V</th>
<th>3µF</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2µF</td>
</tr>
<tr>
<td>13V</td>
<td></td>
</tr>
</tbody>
</table>

(1) 6 µC  (2) 20 µC  (3) 25 µC  (4) 48 µC

14. When $\text{U}^{238}$ changes into $\text{Pb}^{206}$, then the number of $\alpha$ and $\beta$-particles emitted are :-

(1) 6 and 6  (2) 8 and 8
(3) 6 and 8  (4) 6 and 6

15. An ideal gas heat engine operates in a Carnot cycle between $227^\circ C$ and $127^\circ C$. It absorbs 6 kcal at the higher temperature. The amount of heat (in kcal) converted into work is equal to :-

(1) 4.8  (2) 3.5  (3) 1.6  (4) 1.2

16. Two identical piano wires, kept under the same tension T have a fundamental frequency of 600 Hz. The fractional increase in the tension of one of the wires which will lead to occurrence of 6 beats/s when both the wires oscillate together would be :-

(1) 0.01  (2) 0.02  (3) 0.03  (4) 0.04

17. 20m/s की चाल लेने वाली एक रेलवे ऑर्स अंग्रेजीकरण है और एक ट्रेन जो पश्चिम की ओर चुका है तो है। सा चाल लेने गति का है तो गार्ड नहीं होगा।

(1) 40m/s N-W  (2) $20\sqrt{2}$ m/s N-W
(3) 40m/s S-W  (4) $20\sqrt{2}$ m/s S-W

18. (a) घुमते वस्तु का गुण कैंसर्क है जब वह क्यू दूं है जो उसका अंदर क्रम नहीं है किंतु वस्तु का अनुमान का - (b) पृथ्वी की घुमते वस्तु के बाह्य तत्व के सम्बन्ध में के घुमते वस्तु के दृश्य का होता है।

(1) (b) आ (b)  (2) (a) आ (b)
(3) (c) आ (b)  (4) (d) आ (b)

19. चिमा नु चर, दो धे में टैंप्रे का दो संग्रामित्व को 2 µF के संधारित राष्ट्र और चयन करेंगे।

<table>
<thead>
<tr>
<th>18V</th>
<th>3µF</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2µF</td>
</tr>
<tr>
<td>13V</td>
<td></td>
</tr>
</tbody>
</table>

(1) 6 µC  (2) 20 µC  (3) 25 µC  (4) 48 µC

20. जू चु ये अन्य, $\text{U}^{238}$ चिमा और डाटा करे में $\text{Pb}^{206}$ में बदल जाता है तो उस $\text{U}^{238}$ का धारणा की संख्या है:

(1) क्रमशः 6 का 16  (2) क्रमशः 8 का 18
(3) क्रमशः 6 का 18  (4) क्रमशः 8 का 16

21. एक अद्वितीय समीकरण है जो $272^\circ C$ से $127^\circ C$ के बीच चयन करता है। यह इस दृश्य का तक 6 kcal उम्मीद का बोधना बनता है। मावर्य में पर्याप्ति का वक्रीय कम में होगा गैरः

(1) 4.8  (2) 3.5  (3) 1.6  (4) 1.2

22. दो सम दिनियाँ (कैबिनेट) के तर हों का सा बहां सा है जो चुका सा भांग है। इनसे मूल बोध है। किसी एक तर हों तो गुण तेजी में $\pi$ - 1 नए मक्खी दिखा हो या संदर्भ से दों तर हों के एक वस्तु का फर्म का बोध है।

(1) 0.01  (2) 0.02  (3) 0.03  (4) 0.04
17. An engine pumps water through a hose pipe. Water passes through the pipe and leaves it with a velocity of 2 m/s. The mass per unit length of water in the pipe is 100 kg/m. What is the power of the engine?

(1) 800 W  
(2) 400 W  
(3) 200 W  
(4) 100 W

18. The primary and secondary coils of a transformer have 50 and 1500 turns respectively. If the magnetic flux \( \phi \) linked with the primary coil is given by \( \phi = \phi_0 + 4t \), where \( \phi \) is in webers, \( t \) is time in seconds and \( \phi_0 \) is a constant, the output voltage across the secondary coil is:

(1) 30 volts  
(2) 90 volts  
(3) 120 volts  
(4) 220 volts

19. A network of four capacitors of capacity equal to \( C_1 = C, C_2 = 2C, C_3 = 3C \) and \( C_4 = 4C \) are conducted to a battery as shown in the figure. The ratio of the charges on \( C_2 \) and \( C_4 \) is:

(1) \( \frac{7}{4} \)  
(2) \( \frac{22}{3} \)  
(3) \( \frac{3}{22} \)  
(4) \( \frac{4}{7} \)

20. The velocity of electromagnetic wave is parallel to:

(1) \( \vec{B} \times \vec{E} \)  
(2) \( \vec{E} \times \vec{B} \)  
(3) \( \vec{E} \)  
(4) \( \vec{B} \)

21. A converging beam of rays is incident on a diverging lens. Having passed through the lens the rays intersect at a point 15 cm from the lens on the opposite side. If the lens is removed the point where the rays meet will move 5 cm closer to the lens. The focal length of the lens is:

(1) 5 cm  
(2) –10 cm  
(3) 20 cm  
(4) –30 cm

22. A cylindrical metallic rod in thermal contact with two reservoirs of heat at its two ends conducts an amount of heat \( Q \) in time \( t \). The metallic rod is melted and the material is formed into a rod of half the radius of the original rod. What is the amount of heat conducted by the new rod, when placed in thermal contact with same two reservoirs in time \( t \)?

(1) \( \frac{Q}{2} \)  
(2) \( \frac{Q}{4} \)  
(3) \( \frac{Q}{16} \)  
(4) \( 2Q \)
23. In the circuit shown, if a conducting wire is connected between points A and B, the current in this wire will :-

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>Flow from A to B</td>
</tr>
<tr>
<td>(2)</td>
<td>Flow in the direction which will be decided by the value of V</td>
</tr>
<tr>
<td>(3)</td>
<td>Be zero</td>
</tr>
<tr>
<td>(4)</td>
<td>Flow from B to A</td>
</tr>
</tbody>
</table>

24. A drum of radius R and mass M, rolls down without slipping along an inclined plane of angle \( \theta \). The frictional force –

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>Decreases the rotational and translational motion</td>
</tr>
<tr>
<td>(2)</td>
<td>Dissipates energy as heat</td>
</tr>
<tr>
<td>(3)</td>
<td>Decreases the rotational motion</td>
</tr>
<tr>
<td>(4)</td>
<td>Converts translational energy to rotational energy</td>
</tr>
</tbody>
</table>

25. Water is flowing continuously from a tap having an internal diameter \( 8 \times 10^{-3} \) m. The water velocity as it leaves the tap is \( 0.04 \) m/s. The diameter of the water stream at a distance \( 8 \times 10^{-1} \) m below the tap is close to :-

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>( 9.6 \times 10^{-3} ) m</td>
</tr>
<tr>
<td>(2)</td>
<td>( 3.6 \times 10^{-3} ) m</td>
</tr>
<tr>
<td>(3)</td>
<td>( 0.8 \times 10^{-3} ) m</td>
</tr>
<tr>
<td>(4)</td>
<td>( 6.4 \times 10^{-3} ) m</td>
</tr>
</tbody>
</table>

26. From a circular disc of radius R and mass 9M, a small disc of mass M and radius \( \frac{R}{3} \) is removed concentrically. The moment of inertia of the remaining disc about an axis perpendicular to the plane of the disc and passing through its centre is:

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>( MR^2 )</td>
</tr>
<tr>
<td>(2)</td>
<td>( 4MR^2 )</td>
</tr>
<tr>
<td>(3)</td>
<td>( \frac{4}{9}MR^2 )</td>
</tr>
<tr>
<td>(4)</td>
<td>( \frac{40}{9}MR^2 )</td>
</tr>
</tbody>
</table>
27. A lens having focal length \( f \) and aperture of diameter \( d \) forms an image of intensity \( I \). Aperture of diameter \( \frac{d}{2} \) in central region of lens is covered by a black paper. Focal length of lens and intensity of image now will be respectively:-

(1) \( \frac{f}{2} \) and \( \frac{I}{2} \)

(2) \( f \) and \( \frac{I}{4} \)

(3) \( \frac{3f}{4} \) and \( \frac{I}{2} \)

(4) \( f \) and \( \frac{3I}{4} \)

28. The velocity \( v \) of a particle at time \( t \) is given by \( v = at + \frac{b}{t + c} \), where \( a, b \) and \( c \) are constants. The dimensions of \( a, b \) and \( c \) are respectively:

(1) LT\(^{-2}\), L and T

(2) L\(^2\), T and LT\(^2\)

(3) LT\(^2\), LT and L

(4) L, LT and T\(^2\)

29. The equation of state for 5g of oxygen at a pressure \( P \) and temperature \( T \), when occupying a volume \( V \), will be:-

(1) \( \frac{PV}{T} = \frac{5}{16}RT \)

(2) \( \frac{PV}{T} = \frac{5}{32}RT \)

(3) \( \frac{PV}{T} = \frac{5}{16}RT \)

(4) \( \frac{PV}{T} = \frac{5}{32}RT \)

where \( R \) is the gas constant.

30. Work done in increasing the size of a soap bubble from a radius of 3 cm to 5 cm is nearly (Surface tension of soap solution = 0.03 Nm\(^{-1}\)) :-

(1) 2\( \pi \) mJ

(2) 0.4 \( \pi \) mJ

(3) 4\( \pi \) mJ

(4) 0.2 \( \pi \) mJ

31. The additional kinetic energy to be provided to a satellite of mass \( m \) revolving around a planet of mass \( M \), to transfer it from a circular orbit of radius \( R_1 \) to another of radius \( R_2 \) (\( R_2 > R_1 \)) is :-

(1) \( \frac{GmM}{\left( \frac{1}{R_1} - \frac{1}{R_2} \right)} \)

(2) \( 2GmM \left( \frac{1}{R_1} - \frac{1}{R_2} \right) \)

(3) \( \frac{1}{2} GmM \left( \frac{1}{R_1} - \frac{1}{R_2} \right) \)

(4) \( GmM \left( \frac{1}{R_1} - \frac{1}{R_2} \right) \)
32. Curie temperature is the temperature above which:-
(1) Paramagnetic material becomes ferromagnetic material.
(2) Ferromagnetic material becomes diamagnetic material.
(3) Ferromagnetic material becomes paramagnetic material.
(4) Paramagnetic material becomes diamagnetic material.

33. The Earth is assumed to be a sphere of radius R. A platform is arranged at a height R from the surface of the Earth. The escape velocity of a body from this platform is arranged at a height R from the surface of the Earth. The escape velocity of a body from this platform is arranged at a height R from the surface of the Earth. The escape velocity of a body from this platform is v, where v is its escape velocity from the surface of the Earth. The value of v is NOT.

34. One mole of an ideal gas at an initial temperature of T K does 6 R joules of work adiabatically. If the ratio of specific heats of this gas at constant pressure and at constant volume is \( \frac{5}{3} \), the final temperature of gas will be NOT.

35. A certain block weight 15 N in air. It weight 12 N when immersed in water when immersed in another liquid it weighs 13 N, the relative density of the block is:\( \frac{1}{2} \) NOT.

36. A student measures the distance traversed in free fall of a body, initially at rest in a given time. He uses this data to estimate g, the acceleration due to gravity. If the maximum percentage errors in measurement of the distance and the time are \( e_1 \) and \( e_2 \) respectively, the percentage error in the estimation of g is NOT:

37. A galvanometer of resistance 50Ω is connected to a battery of 3V along with a resistance of 2950Ω in series. A full scale deflection of 30 divisions is obtained in the galvanometer. In order to reduce this deflection to 20 division, the resistance in series should be:

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32. कुछ रीत त पएव ह त पहा हत ह। जिस फः -
(1) अनु चु भकी य पएव ह।
(2) ला हचु भकी य पएव ह।
(3) नु चु भकी य पएव ह।
(4) अनु चु भकी य पएव ह।

33. या जत ह कक स्थलीयय को एक गाए हा। उधिती तल से वह हर र खैर एक प्ले ट पएव म बना च गय ह। इस प्ले ट पएव मे से भिन्न पर्क या क्षयकृप्त य भी तल एिसके पएव ह।

34. शिक्षा ठा त बता। शिक्षा आवश्यक नहीं।

35. एक लिंग कज़ाम हवा में 15 बालू और जो इस पर नीचे डूबे हो जाते ह। थिस अवस्था की और जो इसके अग्नि च व में डूबे हो जाते ह।

36. एक बहुत आदिबंध में विश्व अग्नि घात ह। एक निर्देशन जो बहुत बहुत द्वारा दिया गया है।

37. 50Ω प्रत्येक ध के किरण का मै और कोई बाद ते से.
38. Power dissipated across the 8Ω resistor in the circuit shown here is 2 watt. The power dissipated in watt units across the 3Ω resistor is :-

(1) 2.0  (2) 1.0  
(3) 0.5  (4) 3.0

39. If a ball is thrown vertically upwards with speed u, the distance covered during the last ‘t’ seconds of its ascent is :-

(1) ut  (2) \( \frac{1}{2} gt^2 \)  
(3) ut – \( \frac{1}{2} gt^2 \)  (4) (u + gt)t

40. A Young’s double slit experiment uses a monochromatic source. The shape of the interference fringes formed on a screen is:-

(1) hyperbola  (2) circle  
(3) straight line  (4) parabola

41. For shown situation of two dipoles the nature of forces between them are :-

\[ \vec{p}_1 \quad \vec{p}_2 \quad \vec{p}_3 \quad \vec{p}_4 \]

(I) (II)

(1) attraction, attraction  
(2) attraction, repulsion  
(3) repulsion, repulsion  
(4) repulsion, attraction

42. Two particles A and B of equal masses are suspended from two massless springs of spring constants \( k_1 \) and \( k_2 \), respectively. If the maximum velocities, during oscillations are equal, the ratio of amplitudes of A and B is-

(1) \( \sqrt{k_1/k_2} \)  (2) \( k_1/k_2 \)  
(3) \( \sqrt{k_2/k_1} \)  (4) \( k_2/k_1 \)
43. The work functions for metals A, B and C are respectively 1.92 eV, 2.0 eV and 5 eV. According to Einstein’s equation, the metals which will emit photo electrons for a radiation of wavelength 4100Å is/are:

(1) None
(2) A only
(3) A and B only
(4) All the three metals

44. A particle moves along a circle of radius \( \left( \frac{20}{\pi} \right) m \) with constant tangential acceleration. If the velocity of the particle is 80 m/s at the end of the second revolution after motion has begin, the tangential acceleration is :

(1) 40 m/s²
(2) 640 \( \pi \) m/s²
(3) 160 \( \pi \) m/s²
(4) 40 \( \pi \) m/s²

45. For a given circuit output voltage across load resistance will be :

\[ V_i = V \sin t \]

Use stop, look and go method in reading the question
46. Select the incorrect match:
(1) O-nitrophenol > P-nitrophenol ⇒ Vapour pressure
(2) O-nitrophenol < P-nitrophenol ⇒ Boiling point
(3) CH₂OH < CH₂OH ⇒ Viscosity
(4) H₂O < HF ⇒ Boiling point

47. Calculate the enthalpy change for the reaction,
\( \text{H}_2 + \text{F}_2 \rightarrow 2\text{HF} \)

\[ \begin{align*}
\text{H–H} & \quad \text{F–F} \\
= 434 \text{ kJ/mol} & \quad = 158 \text{ kJ/mol} \\
\text{H–F} & \quad \text{spectroscopic constants} \\
= 565 \text{ kJ/mol} & \\
\end{align*} \]

Bond energy of H–H bond = 434 kJ/mol
Bond energy of F–F bond = 158 kJ/mol
Bond energy of H–F bond = 565 kJ/mol

(1) 538 kJ (2) –538 kJ
(3) 27 kJ (4) –27

48. The cause of water pollution is due to:
(1) Micro-organisms (2) Organic wastes
(3) Pesticide (4) All of these

49. The ratio of velocity of electron in second orbit of He⁺ to third orbit of B⁺ is:

\( \frac{5}{3} \quad \text{or} \quad \frac{3}{5} \)

(1) \( \frac{5}{3} \) (2) \( \frac{3}{5} \)
(3) \( \frac{3}{2} \) (4) \( \frac{2}{3} \)

50. In the closest packing of atoms, there are:
(1) One tetrahedral void and two octahedral voids per atom
(2) Two tetrahedral voids and one octahedral void per atom
(3) Two of each tetrahedral and octahedral voids per atom
(4) One of each tetrahedral and octahedral voids per atom

51. Choose the incorrect order of the given properties:
(1) BeCl₂ < LiCl (Electrical conductivity)
(2) NaF < MgF₂ < AlF₃ (Thermal stability order)
(3) BeSO₄ < MgSO₄ < CaSO₄ (Thermal stability order)
(4) LiF > LiCl > LiBr > LiI (solubility order in water)

46. गलत मिला न का चयन की जिक्रः-
(1) O-निट्रोफेनॉल > P-निट्रोफेनॉल ⇒ वापरने प्रेषण
(2) O-निट्रोफेनॉल < P-निट्रोफेनॉल ⇒ गूळां टिंग्लरय बरबर बरबर
(3) CH₂OH < CH₂OH ⇒ विग्लड्य नति
(4) H₂O < HF ⇒ गूळ टिंग्लरय कांक

47. निम्न अभ्यास उत्तर के लिए एन- ठौर रे परसंपन्न नज़ात कांक न करें
\( \text{H}_2 + \text{F}_2 \rightarrow 2\text{HF} \)

\[ \begin{align*}
\text{H–H} & \quad \text{F–F} \\
= 434 \text{ kJ/mol} & \quad = 158 \text{ kJ/mol} \\
\text{H–F} & \quad \text{स्पेक्ट्रोस्कोपिक कांस्टांट्स} \\
= 565 \text{ kJ/mol} & \\
\end{align*} \]

मोटी आयार्यक की है:
(1) \( \frac{5}{3} \) (2) \( \frac{3}{5} \)
(3) \( \frac{3}{2} \) (4) \( \frac{2}{3} \)

50. फस्फा पु. आप के रंग तर्क विविध संरचना-में गलत होते हैं:
(1) फ्लूएलोस्फेनॉल या रिच तम व दो एक्स मोलकल या रिच तम प्रार्थित परमा पु.
(2) दो एक्स मोलकल रिच तम व एक्स्क्वाट मोलकल या रिच तम प्रार्थित परमा पु.
(3) चतुर्दश मोलकल य अक्स मोलकल या रिच तम अप पर ये के दो प्रार्थित परमा पु.
(4) चतुर्दश मोलकल य अक्स मोलकल या रिच तम अप पर ये के बए प्रार्थित परमा पु.

51. दिये गये लक्षण प्रयों का गलत क्रम का चयन की जिक्रः
(1) BeCl₂ < LiCl (विद्युत चयन टक्कर)
(2) NaF < MgF₂ < AlF₃ (प्रयो यर्व्यात व दिवः क्रम)
(3) BeSO₄ < MgSO₄ < CaSO₄ (प्रयो यर्व्यात व दिवः क्रम)
(4) LiF > LiCl > LiBr > LiI (उंगे में तिले गुण)
52. At 10°C, 1 mol gas is allowed to expand reversibly and adiabatically 10 L to 200 L. Then calculate change in entropy -
   (1) zero  (2) +2.5 cal/k  
   (3) 1.38 cal/k  (4) 5.72 cal/k

53. When 23 g Na reacts with 1 mole of propyne then how many mole of H₂ gas will be released :
   (1) 1 mole  (2) 1/2 mole  
   (3) 1.5 mole  (4) 2 mole

54. Correct statement regarding to H-spectrum is :
   (1) For limiting line of lyman series n₁ = 1 and n₂ = 10
   (2) Wavelength for second line of balmer series = \frac{16}{3R}
   (3) Maximum frequency for paschen series (v) = RC  
   (4) For first line of bracket series n₁ = 5 and n₂ = 6

55. If a reaction has the experimental rate expression rate = K [A]^2[B], if the concentration of A is doubled and the concentration of B is halved, the what happens to the reaction rate :-
   (1) Rate becomes double  
   (2) Rate becomes eight times
   (3) Rate becomes tripled  
   (4) No change in rate

56. The IUPAC name of the Wilkinson's catalyst [RhCl(PPh₃)₃] is :
   (1) Chlorido(triphenylphosphine) rhodium(I)
   (2) Chlorido(triphenyl phosphine) rhodium(IV)
   (3) Chlorido(triphenylphosphene) rhodium(O)
   (4) Chlorido(triphenylphosphene) rhodium(VI)

57. Consider two reactions
   I. Zn + conc. HNO₃ (hot) → Zn(NO₃)₂ + X + H₂O
   II. Zn + dil. HNO₃ (cold) → Zn(NO₃)₂ + Y + H₂O
   Compounds X and Y are respectively :
   (1) N₂O, NO  (2) NO₂, N₂O  
   (3) N₂, N₂O  (4) NO₂, NO
58. \[
\begin{align*}
&\text{HCl} + \text{CICH}_2\text{CH}_2\text{CH}_3 \xrightarrow{\text{AlCl}_3, (i) O_2/(ii) H_2O^+} M_i \to N + \text{phenol}
\end{align*}
\]
Here M and N are:

(1) \[\begin{align*}
&\text{and CH}_2\text{COCH}_3
\end{align*}\]

(2) \[\begin{align*}
&\text{and CH}_2\text{CHCHO}
\end{align*}\]

(3) \[\begin{align*}
&\text{and CH}_2\text{CHCHO}
\end{align*}\]

(4) \[\begin{align*}
&\text{and CH}_2\text{COCH}_3
\end{align*}\]

59. For the reaction \[\begin{align*}
\text{A(g)} + 2\text{B(g)} \rightleftharpoons 2\text{C(g)} + \text{D(s)}
\end{align*}\]
2 moles of A, 3 moles of B and 1 mole of C are present in 10L vessel if \(K_c\) for the reaction is 3.6, the reaction will proceed in:

(1) Forward direction
(2) Backward direction
(3) Neither direction
(4) None of these

60. Rate constant varies with temperature by the equation \(\log_{10} K = 5 - 2000 / T\). We can conclude that \((R = 8.314 \text{ Jmol}^{-1}\text{K}^{-1})\):

(1) Pre exponential factor \(A\) is 5
(2) \(E_a\) is 4 kcal/mol
(3) Pre exponential factor \(A\) is \(10^5\)
(4) \(E_a\) is 19.212 kcal/mol

61. What is electronic arrangement of metal atom/ion in octahedral complex with d\(^4\) configuration, if \(\Delta_0 <\) pairing energy.

(1) \[t_2^g e_g^0\]
(2) \[e_g^4 t_2^g\]
(3) \[t_2^g e_g^1\]
(4) \[t_2^g e_g^2\]
62. The IUPAC name of the compound :-

\[
\begin{align*}
&O \quad CN \\
&| \quad | \\
&CH_3-C-CH_2-C-CH_3 \\
&| \\
&CH_3
\end{align*}
\]

(1) 4-Cyano-4-methyl-2-oxo pentane  
(2) 2-Cyano-2-methyl-4-oxo pentane  
(3) 2,2-Dimethyl-4-oxo pentane nitrile  
(4) 4-Cyano-4-methyl-2-pentanone

63. Which of the following intermediate is more stable:--

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

\[
\begin{align*}
&(1) \quad \text{NO}_2 \\
&(2) \quad \text{NO}_2 \\
&(3) \quad \text{NO}_2 \\
&(4) \quad \text{NO}_2}
\end{align*}

64. A 0.1 M solution of HF is 1% ionized. What is the \( K_a \)?

(1) \( 10^{-5} \)  
(2) \( 10^{-4} \)  
(3) \( 3 \times 10^{-5} \)  
(4) \( 3 \times 10^{-4} \)

65. An azeotropic solution of two liquids has a boiling point lower than either of them when it:

(1) Shows negative deviation from Raoult's law  
(2) Shows no deviation from Raoult's law  
(3) Shows positive deviation from Raoult's law  
(4) Is saturated

66. Thermally most stable compound is:-

(1) HOCIO_3  
(2) HOCIO_2  
(3) HOCl  
(4) HOCIO

67. (A) and (B) are:

(1) Chain Isomer  
(2) Positional Isomer  
(3) Metamer  
(4) Functional Isomer
68. Which of the following reaction will not yield phenol:

(1) \[ \text{Cl} \text{NaOH(aq.)} \text{Room temperature} \]
(2) \[ \text{NCl}_2 \text{H}_2\text{O} \text{[Warm]} \]
(3) \[ \text{Olium} \]
(4) All will yield phenol

69. \[ \text{H}^+ + \text{Cr}_2\text{O}_7^{2-} + \text{SO}_3^{2-} \rightarrow \text{Cr}^{3+} + \text{SO}_4^{2-} + \text{H}_2\text{O} \]
In balance reaction coefficient of \( \text{H}^+ \) and \( \text{SO}_4^{2-} \) will be respectively :-
(1) 3, 8
(2) 3, 4
(3) 4, 1
(4) 8, 3

70. Select the correct statement :-
(1) When solution of alkali metal in liquid \( \text{NH}_3 \) is on standing then all alkali metals forms stable amide
(2) The intensity of blue colour of liquid ammonia solution of alkali metal increases on increasing the concentration of metal
(3) The paramagnetic character of alkali metal in liquid \( \text{NH}_3 \) solution increases on increasing the concentration of metal
(4) The blue colour of alkali metal in liquid \( \text{NH}_3 \) solution is due to absorption of orange radiation

71. Consider the following values of \( \text{IE(eV)} \) for elements W and X :-

<table>
<thead>
<tr>
<th>Element</th>
<th>( \text{IE}_1 )</th>
<th>( \text{IE}_2 )</th>
<th>( \text{IE}_3 )</th>
<th>( \text{IE}_4 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>W</td>
<td>10.5</td>
<td>15.5</td>
<td>24.9</td>
<td>79.8</td>
</tr>
<tr>
<td>X</td>
<td>8</td>
<td>14.8</td>
<td>78.9</td>
<td>105.8</td>
</tr>
</tbody>
</table>

Other two elements Y and Z have outer electronic configuration \( \text{ns}^2 \text{np}^4 \) and \( \text{ns}^2 \text{np}^5 \) respectively. According to given information which of the following compound(s) is/are not possible.

(a) \( \text{W}_2\text{Y}_3 \)  (b) \( \text{X}_2\text{Y}_3 \)  (c) \( \text{WZ}_2 \)  (d) \( \text{XZ}_2 \)
(1) a, b  (2) b, c  (3) c, d  (4) a, d
72. Decreasing (-I) power of given groups is: -
   (A) –CN  (B) –NO₂  (C) –NH₂  (D) –F
   (1) B > A > D > C  (2) B > C > D > A
   (3) C > B > D > A  (4) C > B > A > D

73. The major product in the following reaction

\[ \text{CH}_3\text{OH} + \text{HCl} \xrightarrow{\text{heat}} \]

is:

\[ \begin{array}{llll}
\text{CH}_3\text{Cl} & \text{CH}_2\text{Cl} & \text{CH}_2\text{OH} & \text{CH}_2\text{OH} \\
\text{OH} & \text{Cl} & \text{OH} & \text{Cl}
\end{array} \]

74. Which of the following gas has highest critical temperature:
   (1) He(g)  (2) Ne(g)  (3) N₂(g)  (4) SO₂(g)

75. Select correct statement:
   (1) Acidic strength of HBr > HCl, but reverse is true for their reducing property
   (2) Basic strength of PH₃ > AsH₃, but reverse is true for their bond angle
   (3) Dipole moment of CH₃Cl > CH₃F, but reverse is true for their H – C – H bond angle
   (4) \( K_a \) of fumaric acid is higher than maleic acid but reverse is true for their \( K_a \)

76. Which of the following is true alum.
   (1) Li₂SO₄·Al₂(SO₄)₃·24H₂O
   (2) K₂SO₄·Al₂(SO₄)₃·24H₂O
   (3) CaSO₄·Cr₂(SO₄)₃·24H₂O
   (4) Both (1) and (2)
77. The decreasing order of stability of following anions is :-

(1) Q > R > S > P  (2) R > Q > P > S  
(3) S > P > R > Q  (4) P > Q > R > S

78. Compound A and C in the following reaction are:

\[ \text{CH}_3\text{CHO} \rightarrow \text{A} \rightarrow \text{B} \rightarrow \text{C} \]

(1) Identical  (2) Positional Isomer  
(3) Functional Isomer  (4) Optical Isomer

79. Mass percentage of C, H and O in a compound are 60%, 13.33% and 26.67% respectively. Molecular weight of the compound is 60. The molecular formula of the compound is :-

(1) CH$_3$OH  (2) C$_2$H$_6$O$_2$  
(3) C$_2$H$_6$O  (4) C$_3$H$_8$O

80. Which of the following process involves smelting:-

(1) 2PbS + 3O$_2$ → 2PbO + 2SO$_2$  
(2) Al$_2$O$_3$ . 2H$_2$O → Al$_2$O$_3$ + 2H$_2$O  
(3) Fe$_2$O$_3$ + CO → 2Fe + 2CO$_2$  
(4) Cr$_2$O$_3$ → 2Cr + Al$_2$O$_3$

81. P$_4$O$_{10}$ has short & long P–O bonds. The number of short P–O bond in this compound is :-

(1) 12  (2) 2  (3) 3  (4) 4

82. Enzyme are :-

(1) Proteins  (2) Minerals  
(3) Oils  (4) Fatty acids

83. Electrolysis

A (major product)

(1)  (2)  
(3)  (4)
84. The standard potential of a Co^{2+}/Co electrode is \(-0.28\) V and the standard potential of the cell
\(\text{Pt|Ti}^{2+} (aq) , \text{Ti}^{3+} (aq)||\text{Co}^{2+} (aq)|\text{Co(s)}\) is 0.09 V. What is the standard potential of the
\(\text{Ti}^{2+} (aq) | \text{Ti}^{3+} (aq)\) electrode? :-
(1) \(-0.37\) V
(2) 0.37 V
(3) \(-0.19\) V
(4) 0.19 V

85. Which of the following will have three stereoisomeric forms:-
(i) \([\text{Cr(NO}_3)_3(\text{NH}_3)_3]\)  
(ii) \(K_3[\text{Co(C}_2\text{O}_4)_3]\)
(iii) \(K_3[\text{CoCl}_2(\text{C}_2\text{O}_4)_2]\)
(iv) \([\text{Co BrCl(en)}_2]\)
(1) iii, iv
(2) i, ii and iv
(3) Only iv
(4) All

86. The d-orbitals which are involved in hybridisation of central atom in ICl\(_4^-\) are:-
(1) \(d_{z^2}, d_{x^2-y^2}\)
(2) \(d_{x^2-y^2}, d_{xy}, d_{yz}, d_{zx}\)
(3) \(d_{z^2}, d_{xy}, d_{yz}, d_{xz}\)
(4) \(d_{xy}, d_{xz}, d_{yz}\)

87. Nylon-6,6 is not a :-
(1) Condensation polymer
(2) Polyamide
(3) Copolymer
(4) Homopolymer

88. The best reagent for converting 2-phenyl propanamide into 2-phenyl propanamine is :-
(1) Excess H\(_2\)
(2) Br\(_2\) in aqueous NaOH
(3) Iodine in presence of red phosphorus
(4) LiAlH\(_4\) in ether

89. Tobacco seed globin forms face centred cubic crystals with unit cell dimension of 12.3 nm and a
density of 1.287 g cm\(^{-3}\). Its molecular mass will be:-
(1) 362 g mol\(^{-1}\)
(2) \(3.6 \times 10^5\) g mol\(^{-1}\)
(3) 36 g mol\(^{-1}\)
(4) \(3.6 \times 10^3\) g mol\(^{-1}\)

90. Which of the following is not a characteristic of transition element :-
(1) These forms organometallic compounds
(2) These forms large number of complexes
(3) These represents variable oxidation states
(4) These group oxidation state is (+3)
91. Which of the following is not correct for viruses?
(1) Virus contains both RNA and DNA
(2) They are inert outside their specific host cell
(3) Viruses are obligate parasites
(4) Genetic material of virus is infectious

92. Glycosilation completes in which cell organelle?
(1) Golgi body (2) R.E.R (3) Mitochondria (4) Lysosome

93. The mineral nutrient, necessary for oil synthesis in crucifer plants, is:
(1) Cobalt (2) Sulphur (3) Boron (4) Nickel

94. In a population of 5000 individuals, 450 individuals show a recessive trait. What will be number of heterozygous individual in this population?
(1) 2100 (2) 4500 (3) 1500 (4) 1050

95. Choose wrong statement:
(1) Nucellus (2) Archesporium (3) Aril (4) Embryo sac

96. Which of the following occur by the end of first trimester of pregnancy:
(1) Formation of eyelashes (2) Separation of eyelids (3) Body is covered with fine hairs (4) Formation of limbs

97. Which of the following is not correct for viruses?
(1) Virus contains both RNA and DNA (2) They are inert outside their specific host cell (3) Viruses are obligate parasites (4) Genetic material of virus is infectious

98. Flat body and suckers is the distinctive feature of:-
(1) Ctenophora (2) Annelida (3) Platyhelminthes (4) Arthropoda

99. Following statements are true except:-
(1) Parathyroid gland are present on back side of thyroid gland.
(2) Thymosin plays a major role in the differentiation of T-lymphocyte
(3) Testosterone is a steroidal hormone
(4) Thyrocalcitonin increases blood calcium level

100. Inulin is a polymer of:
(1) Glucose (2) Fructose (3) Sucrose (4) Maltose
101. Which of the following statement is true?
(1) Living organisms share similarities only vertically
(2) Increase in mass and numbers are twin characters of reproduction
(3) Planaria exhibits true regeneration
(4) Consciousness is not a defining feature of living organisms

102. Dark Reaction completes in which part of chloroplast?
(1) Stroma (2) Chlorophyll (3) Granum (4) Thylakoid

103. Which pair is wrong?
(1) Guttation → Hydathodes
(2) Root pressure → Active absorption of water
(3) Stomata open → K-malate formation
(4) Path of Ascent of sap → symplast

104. The figure below is the diagrammatic representation of the E.Coli vector pBR 322. Which one of the given options correctly identifies its certain component(s)?
(1) Hind III, EcoRI-selectable markers
(2) ampR, tetR-antibiotic resistance genes
(3) ori-original restriction enzyme
(4) rop-reduced osmotic pressure

105. How many reduction divisions are required to produce a mature female gametophyte of angiosperms?
(1) Two (2) One (3) Three (4) Four

106. Antrum is characteristic of:-
(1) Corpus luteum (2) Tertiary follicle (3) Secondary follicle (4) Developing primary follicle

107. Protection against the chemical and mechanical stresses are provided by?
(1) Areolar connective tissue (2) Compound epithelium (3) Simple epithelium (4) Cartilage

108. Which of the following statement is true?
(1) In the early stages of embryo, where the blastocyst is formed, the mass of cells reduces to a single cell called the morula
(2) The zona pellucida provides the blastocyst with nutrients and oxygen
(3) The inner cell mass of the blastocyst gives rise to the three primary tissues of the embryo
(4) The blastocyst implants into the endometrial lining of the uterus

109. The figure below is the diagrammatic representation of a nucleus. Which one of the given options correctly identifies its certain component(s)?
(1) Nucleolus (2) Chromosomes (3) Nucleus (4) Nucleoplasm

110. Which of the following describes the structure of a typical angiosperm flower?
(1) Perianth (2) Androecium (3) Gynoecium (4) Filaments

111. Which of the following statements is true?
(1) In the late stages of puberty, the brain releases hormones that stimulate the development of secondary sexual characteristics
(2) During ovulation, the follicle ruptures and releases a mature egg into the oviduct
(3) The menstrual cycle lasts for 28 days in all women
(4) Menstruation occurs when the endometrium thickens and prepares for implantation

112. Which of the following structures is responsible for the formation of the blastocyst?
(1) Cortical granules (2) Cortical alveoli (3) Cortical cells (4) Zona pellucida

113. Which of the following statements is true?
(1) The genetic material of a cell is contained within the nucleus
(2) The nucleus is surrounded by a single membrane
(3) The nucleus is responsible for the synthesis of nucleic acids
(4) The nucleus is the site of protein synthesis

114. What is the function of the zona pellucida?
(1) Provides a barrier between the egg and sperm
(2) Assists in the transportation of sperm to the egg
(3) Allows for the binding of sperm to the egg
(4) Encourages the development of the embryo

115. Which of the following statements is true?
(1) The zona pellucida is synthesized by the oocyte
(2) The zona pellucida is synthesized by the follicle cells
(3) The zona pellucida is synthesized by the granulosa cells
(4) The zona pellucida is synthesized by the theca cells

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(3) The zona pellucida is synthesized by the granulosa cells
(4) The zona pellucida is synthesized by the theca cells
108. Male moth recognise female moth of their species by sensing pheromones. This is an example of :- 
   (1) Gametic isolation (2) Habitat isolation (3) Behavioural isolation (4) Mechanical isolation 

109. What is not true about hormone produced by β cells of pancreatic "Islet of Langerhans" ?
   (1) Stimulate conversion of glucose to glycogen
   (2) It is a peptide hormone
   (3) It enhances cellular glucose uptake and utilisation
   (4) It increase blood glucose level 

110. How many of the following are the functional features of an ecosystem?
   Species composition, Productivity, Decomposition, energy flow, Nutrient cycling, Stratification.
   (1) Two (2) Three (3) Four (4) Five 

111. Read the following statements carefully :-
   (A) Dikaryophase is long in phycomycetes
   (B) Fungal cell wall is made up of chitin
   (C) A large number of fungi of class deuteromycetes are decomposers of dead organic matter
   (D) Mushrooms belong to group basidiomycetes
   How many statements are correct ?
   (1) One (2) Two (3) Three (4) Four 

112. Who proposed the hypothesis that the bodies of animals and plants are composed of cells and product of cells ?
   (1) Schwann (2) Schleiden (3) Rudolf virchow (4) Brown 

113. Tightly attached organic group with apoenzyme is called as :-
   (1) Co factor (2) Co-enzyme group (3) Activator (4) Prosthetic group 

114. Flower colour in purple in sweet pea due to non-allergic interaction between two dominant genes C and P. Read the following statements for plant with ccPP genotype –
   (a) Flower colour is white
   (b) No synthesis of chromagen
   (c) Raw materials are metabolised into chromagen.
   (d) Crossing with heterozygous purple flowered plant will yield equal percentage of purple and white flowered plants.
   Select the option which have incorrect statements?
   (1) Statements (a) and (b)
   (2) Statements (c) only
   (3) Statements (a), (b) and (d)
   (4) Statements (c) and (d) 

108. नर मात्र तो उनकी जाती की मादा की फूलों में - सबसे सफ़ेचह नहीं है। का उन्होंने हाय करता है।
   (1) पुरुष मात्र युग्म चुका कर्म (2) आ या युग्म का कर्म का
   (3) इस वहां रुपकाच्छ का वक्र  (4) रुपकाच्छ का वक्र का

109. आ ता या देख तो कर्म का तक या इसका वक्र का
   (1) का लू तो जेर र डोमां जो बनाने की गुणवत्ता वा में तिमले
   (2) का फूली नहीं है।
   (3) का के रिश्ते तो लू तो जर्जी का हुए है। उन जो के (4) का है में रूप के जबरे रल के बनाता है।

110. निम्न में से किस परिस्थिति कितने के लिए होते हैं?
   (1) सांस्कृतिक धातुन, उत्पादक, अक्षय, खास या वह, पैर, या पार रल रिश्ते सा।
   (1) दो (2) तीन (3) चार (4) पाँच 

111. निम्न क्षण में कौन मे खास मे पड़ते?
   (A) फाइनोम किसी के किसी निर्देश व अर्थ तो (2) बाध्य की को विभाजन दिन।
   (B) कब्र विभाजन का विश्लेषण दिन।
   (C) का इन दो में अधृत जीवन की अधृत व जीवन का, बस, न किसी व बस अधृत है।
   (D) यह खास बह एंडिड वा अधृत जीवन के दर्शने वा किसने का का नहीं है।
   (1) एक (2) दो (3) तीन (4) चार 

112. किसका समानी है, फिर इस दोनों विद्युत व जीवन की विभाजन अंत्तर शिखर तो गंवाहिए है?
   (1) तीन (2) या है (3) तीन (4) चार 

113. इसे एंड्रॉम के सादो के दो दूर तथा उच्च, जीवन निकलना है।
   (1) श्लोक का रक मानना के अर्थ की सूचना है।
   (2) श्लोक का रक मानना के अर्थ की सूचना है।
   (3) द्वीप की ओर से बनाए गए हैं।
   (4) यह अर्थ का नहीं है।

114. मोटी देश में पुरुषका रंग दे जाते हैं। ccPP का ब्लेन्जा की वन अल्लिया अंत के रंग के बाध्य के गांव वन है।
   (1) पुरुष प्रबुद्ध वाला दे हैं।
   (2) बांग जाता संयंत्र में नहीं होते।
   (3) किसी का लाल रंग प्रबुद्ध नहीं होता।
   (4) cccP प्रबुद्ध दे जाते हैं।

उ प्रबुद्ध रंग का बाध्य का नहीं है।
   (1) बता (a) व (b)
   (2) के बाद का (c)
   (3) बता (a), (b) व (d)
   (4) बता (c) व (d)
115. The embryosac of angiosperms contain:
(1) 3 celled egg apparatus, 3 antipodal cells and 2 polar nuclei
(2) 2 celled egg apparatus, 3 antipodal cells and 2 polar nuclei
(3) 3 celled egg apparatus, 2 antipodal cells and 1 polar nucleus
(4) 3 celled egg apparatus, 1 antipodal cell and 2 polar nuclei

116. In the blastocyst, trophoblast is
(1) Arrangement of blastomeres in an outer layer
(2) Arrangement of blastomeres in an inner layer
(3) Arrangement of inner group of cells
(4) Arrangement of both inner group of cells and outer layer of blastomeres

117. Find out the correct match from the following table:

<table>
<thead>
<tr>
<th>Column-I</th>
<th>Column-II</th>
<th>Column-III</th>
</tr>
</thead>
<tbody>
<tr>
<td>i Gastric lipase</td>
<td>Gastric juice</td>
<td>Digest starch</td>
</tr>
<tr>
<td>ii Carboxypeptidase</td>
<td>Pancreatic juice</td>
<td>Acts on protein</td>
</tr>
<tr>
<td>iii Salivary amylase</td>
<td>Saliva</td>
<td>Acts on elastin protein</td>
</tr>
</tbody>
</table>

(1) i & ii  (2) ii only  (3) i only  (4) iii only

118. The above diagram shows which type of evolution between S₁ and S₂:
(1) Convergent  (2) Divergent  (3) Adaptive radiation  (4) Mega evolution

119. Which of the following labelled part is choroid?
(1) A  (2) B  (3) C  (4) D
120. Extinction of stellar's sea cow is due to which of the following reasons :-

1. Habitat loss
2. Over exploitation
3. Alien species invasion
4. Co-extinction

121. Which of the following statement is false about heterosporous pteridophytes ?

1. They are seeded plants
2. Germination of zygote takes place within female gametophyte
3. Prothallus is absent
4. They are ancestors of gymnosperms due to seed habit

122. Inflorescence, in which peduncle is thin, long, weak & hanging downward and flowers are sessile & unisexual, is called.

1. Spike
2. Catkin
3. Raceme
4. Spadix

123. Which one of the following organism never releases oxygen gas during light reaction ?

1. Anabaena
2. Diatoms
3. Chromatium
4. Chlorella

124. Multiple alleles can be found only when :-

1. Population studies are made
2. Individual study as made
3. Mutation is absent
4. Dominance is present

125. Relationship between crow and cuckoo (koel) is :-

1. Brood parasitism
2. Predation
3. Competition
4. Mutualism

126. The organ, where immature lymphocytes differentiate into antigen-sensitive lymphocytes ?

1. Bone marrow
2. Peyer's patches
3. Spleen
4. Lymph nodes

127. If a person takes 100gm. carbohydrates, 60 gm protein and 30 gm fat. Then how much amount of energy he get :-

1. 400 KCal
2. 910 KCal
3. 500 KCal
4. 555 KCal
128. Find out the correct option regarding human heart and circulation:

(1) (i) Systemic heart (A+B), (ii) Pulmonary heart (C+D), (iii) Pulmonary circulation E, (iv) Systemic circulation F

(2) (i) Pulmonary heart (C+D), (ii) Systemic heart (A+B), (iii) Pulmonary circulation E, (iv) Systemic circulation F

(3) (i) Pulmonary heart (A+B), (ii) Systemic heart (C+D), (iii) Pulmonary circulation E, (iv) Systemic circulation F

(4) (i) Pulmonary heart (A+C), (ii) Systemic heart (B+D), (iii) Pulmonary circulation F, (iv) Systemic circulation E

129. Which is correct regarding corpora quadrigemina:

(1) It is composed of 4 hollow lobes
(2) It is located between pons and medulla
(3) It is the part of hind brain
(4) This is characteristic of mammals

130. In a terrestrial ecosystem:

(1) A much larger fraction of energy flows through the grazing food chain
(2) A much larger fraction of energy flows through the detritus food chain
(3) Equal energy flows through both grazing as well as detritus food chain
(4) Their is no energy flow

131. The seed of Cycas has two cotyledons, still Cycas is not placed under dicots because:

(1) Lacks vessels
(2) Seed is not covered by fruit
(3) Female cone is absent
(4) Male gamete is motile
132. Which of the following statement is incorrect for meristematic tissue?
(1) It is an undifferentiated tissue
(2) It has both primary as well as secondary cell wall
(3) Cells have dense cytoplasm
(4) They do not have intercellular spaces

133. Which matching is wrong?

<table>
<thead>
<tr>
<th>Auxin</th>
<th>Gibberellin</th>
<th>Cytokinin</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Rooting hormone</td>
<td>Bolting hormone</td>
<td>Antiaging hormone</td>
</tr>
<tr>
<td>2 Avena curvature test</td>
<td>α- amylase action test</td>
<td>Root inhibition test</td>
</tr>
<tr>
<td>3 F.W.went</td>
<td>Kurosawa, Yabuta</td>
<td>Miller</td>
</tr>
<tr>
<td>4 Phototropism</td>
<td>foolish seedling disease</td>
<td>Tobacco pith culture</td>
</tr>
</tbody>
</table>

134. In wheat grain colour is controlled by 3-polygenes then what is the percentage of offspring in F₁ generation which is similar to either of parent?
(1) Less than 5%
(2) 12.5%
(3) 3.125%
(4) Zero

135. Black foot disease occurs due to:
(1) Cadmium
(2) Mercury
(3) Arsenic
(4) Copper

136. Turner’s syndrome is characterised by:
(1) Short stature and under developed male characters
(2) Tall stature with feminised characters
(3) Tall stature and underdeveloped feminine characters
(4) Short stature and underdeveloped feminine characters

137. Conditional reabsorption of Na⁺ and water takes place in:
(1) PCT
(2) Ascending limb of loop of Henle
(3) DCT
(4) Descending limb of loop of Henle
Find out the correct words for A, B, C, D, E and F in the above flow chart

(1) A Adrenalin  B Thyroxin  C Decrease
    D Decrease  E Increase  F Increase
(2) A Nor adrenalin  B Ach  C Increase
    D Decrease  E Increase  F Decrease
(3) A Nor adrenalin  B Ach  C Increase
    D Increase  E Increase  F Decrease
(4) A Ach  B Nor adrenalin  C Increase
    D Decrease  E Increase  F Increase

139. Read the following statements :-

(A) Impulse transmission across an electrical synapse is always faster than that across a chemical synapse
(B) At the site of excitation, Na$^{+}$ ions channels open and restore the resting potential of the membrane
(C) Cerebral cortex is made up of gray matter because myelinated axons are concentrated here.
(D) Association areas are responsible for memory, intersensory association and communication
(E) Limbic system is composed of pons, medulla and cerebellum.

Which statements are correct ?

(1) A,B,E  (2) B,C
(3) B,C,D  (4) A,D
140. Which of the following is most widely used in removing particulate matter present in the exhaust from a thermal power plant?

1. Cyclonic arrester
2. Scrubber
3. Electrostatic precipitator
4. Catalytic conver

141. Which of the following type of microbes is present in gut of cattles as symbiont?

1. Halophiles
2. Thermoacidophiles
3. Methanogens
4. Mycoplasma

142. Match column-I with column-II & choose right option: -

<table>
<thead>
<tr>
<th>Column-I (Type of vascular bundle)</th>
<th>Column-II (Example)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(i) conjoint, collateral, open</td>
<td>(a) stem of Dracaena</td>
</tr>
<tr>
<td>(ii) conjoint, bicolateral, open</td>
<td>(b) stem of cucurbits</td>
</tr>
<tr>
<td>(iii) Amphicribal</td>
<td>(c) stem of dicot</td>
</tr>
<tr>
<td>(iv) Amphivasal</td>
<td>(d) ferns rhizome</td>
</tr>
</tbody>
</table>

option: -

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

143. How many plants in the given list below have C₃ Cycle?

Radish, Sugarcane, Sorghum, Atriplex, wheat, Crassula.

1. four
2. five
3. three
4. six

Time Management is Life Management
144. Complete genome of which crop & non-crop plant has been sequenced respectively:–
(1) Rice & Arabidopsis
(2) Arabidopsis & Caenorhabditis
(3) Arabidopsis & Rice
(4) Arabidopsis & Sunflower

145. Find out the B and C:–
(1) B- Ecotone C- edge species
(2) C- Ecotone B- edge species
(3) Both are ecotone
(4) Both are edge effect

146. Consider the following four statements (a-d) about AIDS/HIV and select the option which includes all the correct ones only:–
(a) Characterised by decrease in number of killer T-cells
(b) HIV virus has 2 identical molecule of ds RNAs
(c) AIDS spread through touch, physical contact, hugging, kissing
(d) There is always a time lag between the infection and appearance of AIDS symptoms.

Options:–
(1) statements (b) and (d)
(2) statements (a), (b) and (d)
(3) statements (b) only
(4) statements (d) only
147. Match the column I & II and choose the option which has correct matching :-

<table>
<thead>
<tr>
<th>Column-I</th>
<th>Column-II</th>
</tr>
</thead>
<tbody>
<tr>
<td>i Flame cells</td>
<td>a Planaria</td>
</tr>
<tr>
<td>ii Nephridia</td>
<td>b Cockroach</td>
</tr>
<tr>
<td>iii Malphigian tubules</td>
<td>c Shark</td>
</tr>
<tr>
<td>iv Antennal glands</td>
<td>d Earthworm</td>
</tr>
<tr>
<td>v Kidney</td>
<td>e Prawn</td>
</tr>
</tbody>
</table>

148. Find out the incorrect statement :-
1. Locomotion requires a perfect coordinated activity of muscular, nervous and skeletal system
2. Passage of ova through the female reproductive tract is also facilitated by the ciliary movement.
3. All movements are locomotions but all locomotions are not movements

149. Antherozoids of first archegoniate plants are :-
1. Monoflagellate
2. Biflagellate
3. Non flagellate
4. Multiflagellate

150. Identify the correct match from column I, II and III :-

<table>
<thead>
<tr>
<th>Column I</th>
<th>Column II</th>
<th>Column III</th>
</tr>
</thead>
<tbody>
<tr>
<td>(I) Nitrate</td>
<td>(a) Nuclear plants</td>
<td>(i) Acid rain</td>
</tr>
<tr>
<td>(II) Radioactive waste</td>
<td>(b) Thermal plants</td>
<td>(ii) Ozone depletion</td>
</tr>
<tr>
<td>(III) CFC</td>
<td>(c) Farm lands</td>
<td>(iii) Blue-baby syndrome</td>
</tr>
<tr>
<td>(IV) SO₂</td>
<td>(d) Jet plane</td>
<td>(iv) Cancer</td>
</tr>
</tbody>
</table>

147. निम्नलिखित प्रश्न के लिए पक्षे व वि हिस्से ने जिसे साचे हो लिया या मिला था हो तो :-

<table>
<thead>
<tr>
<th>कोई खंड</th>
<th>कोई खंड</th>
</tr>
</thead>
<tbody>
<tr>
<td>i ज्वा ला के शिक्षा पक्षे ने दिया</td>
<td>a Planaria</td>
</tr>
<tr>
<td>ii ने फ्रेंड्स के ब वि के चेच</td>
<td>b के कोच च</td>
</tr>
<tr>
<td>iii मे मल्लला र ललित वि के के</td>
<td>c Shark</td>
</tr>
<tr>
<td>iv स्टो नलगर्म फिभ के चुआ</td>
<td>d Earthworm</td>
</tr>
<tr>
<td>v लू ब क</td>
<td>e प्रायोगिक (प्रायोगिक)</td>
</tr>
</tbody>
</table>

148. आर कर न की पक्षे न के को ।
1. प्रचालन है ते प्यार, कं की लख्चे ते त्रिक्षा ते त्र का पूरा हो ना चा हिए।
2. यादाजन ते त्र में अंडें की गतिशक्षा 41 गतियों है जो जितें है।
3. समस्त गतियों प्रचालन हो ने ते है। पं ते समस्त प्रचालन गतियों नहीं हो ने।
4. मैं खेला फ वर्ता। लू के संयुक्त अभी बा वड़ गति रह है.

149. मरुस्त्र नी यथापद के पु मन्य हो ने है।
1. एक कर 1 खिल 1 क
2. दिक्का 1 खिल 1 क
3. अक्षर 1 खिल 1 क
4. बाहु 1 खिल 1 क

150. आ 1111 आ 111 में सभी मिली ता के फाँचा निषेध

<table>
<thead>
<tr>
<th>Column I</th>
<th>Column II</th>
<th>Column III</th>
</tr>
</thead>
</table>
| (I) NO₃ | (a) सू खट्टा य | (i) अली यथापद ।
| (II) इतिहास के अंडे | (b) ता पवित्र वि से ते | (ii) अक्षर न अक्षर न ।
| (III) CFC | (c) खेत त्र | (iii) स्वे. के से से ग ।
| (IV) SO₂ | (d) जट पलना | (iv) केक्क ट दोग ।

(1) I-a-iii, II-b-ii, III-d-iv, IV-c-i
(2) II-b-i, I-c-iii, III-a-iv, IV-d-ii
(3) III-d-ii, I-c-iii, II-a-iv, IV-b-i
(4) I-a-i, II-b-iii, III-d-iv, IV-c-ii
151. Which of the following is used as quick referral systems in taxanomical studies ?
(1) Keys (2) Herbarium (3) Manuals (4) Monographs

152. Select the incorrect option about splicing ?
(1) It takes place with in nucleus in eukaryotes
(2) In this process introns are joined
(3) It takes place in cytoplasm in prokaryotes
(4) Both 2 and 3

153. Dihybrid maize plant is having genotype CcIi. In this plant seed colour and seed shape genes are linked and after test cross of this plant the ratio of parental and new combination in offsprings is 18 : 2. What will be the distance between the seed shape and seed colour gene ?
(1) 4 centimorgon (2) 5 centimorgon (3) 10 centimorgon (4) 20 centimorgon

154. A normal woman (whose father is colour blind but mother is normal) marries a haemophilic man with hyper trichosis. What percentage of progeny will show genotypically any two of the traits out of the three mentioned above at a given time :-
(1) 0% (2) 25% (3) 50% (4) 75%

155. What is the percentage of photosynthetically active radiation (PAR) in the incident solar radiation ?
(1) 100% (2) 50% (3) 1–5% (4) 2–10%

156. Incorrect about common cold is :-
(1) Common cold usually last for 3-7 days
(2) Characterised by nasal congestion and discharge
(3) It infects nose and respiratory passage including lungs
(4) Droplet infection
157. Consider the following characters and choose the option which have characters those are not present in Aves :-
A- Scales on all over the body
B- Endoskeleton is fully ossified
C- Skin is dry without glands except some oil gland
D- Glands on body to feed their young ones
(1) A and C
(2) A, B and C
(3) A and D
(4) B and C

158. Which one of the following is an example of fibrous joint :-
(1) Between carpal and metacarpal
(2) Knee joint
(3) Between atlas and axis
(4) Sutures between skull bones

159. Pinnately compound leaves and plamately compound leaves are found in :-
(1) Mango and Neem respectively
(2) Neem and Silk cotton respectively
(3) Silk cotton and Mango respectively
(4) Makoi and china rose respectively

160. Match the column I and column II :-

<table>
<thead>
<tr>
<th>Column I</th>
<th>Column II</th>
</tr>
</thead>
<tbody>
<tr>
<td>(A) Murrah</td>
<td>(i) Horse</td>
</tr>
<tr>
<td>(B) Brown swiss</td>
<td>(ii) Sheep</td>
</tr>
<tr>
<td>(C) Kathiawari</td>
<td>(iii) Bufflo</td>
</tr>
<tr>
<td>(D) Lohi</td>
<td>(iv) Cow</td>
</tr>
</tbody>
</table>

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

161. Which of the following are not surrounded by any membrane ?
(1) Nucleolus, Glyoxisome, and chromosome
(2) Ribosome, Nucleus, and Peroxisome
(3) Centriole, Ribosome and Nucleolus
(4) Chromosome, Ribosome and Sphaerosome

162. The organic nutrients in phloem undergo __ transport
(1) Unidirectional
(2) Bidirectional
(3) Only basipetal
(4) Only acropetal

163. In Mirabilis plant tallness is dominant over dwarfiness while red flowers are incompletely dominant over white flowers. A pure tall & red flowered plant is crossed with dwarf & white flowered plant. What will be the percentage probability of getting pink & white flowered plants in F₂ generation?
(1) 25% and 50%
(2) 50% and 25%
(3) 75% and 0%
(4) 50% and 0%

164. Shape of seed depends on starch granules size. Inheritance of seed shape show ........ relationship while inheritance of starch grains show ...........
(1) Dominant recessive, codominance
(2) Incomplete dominance, codominance
(3) Dominant - recessive, incomplete dominance
(4) Codominance, incomplete dominance

165. Which of the following statements is true about regulators?
(A) All birds and mammals and a very few lower vertebrate and invertebrate species are regulators
(B) Bergmann's rule and Allen's rule is only applicable to regulators
(C) The mechanisms used by most mammals to regulate body temperature is similar to the ones used by humans
(D) Regulators exclusively exhibit aestivation and hibernation
(1) A, B
(2) A,B,C,D
(3) A,B,C
(4) A,B,D
166. Narrowing and increasing height of peak in a population distribution curve indicates :-
(1) More individuals acquire value other than mean character value.
(2) More individuals acquire peripheral character
(3) More individuals acquire mean character value
(4) All of the above

167. Choose odd from the given examples :-
(1) Bombyx
(2) Laccifer
(3) Locusta
(4) Apis

168. Anatomical boundaries of thoracic cavity are :-

<table>
<thead>
<tr>
<th>DORSAL</th>
<th>VENTRAL</th>
<th>LATERAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Vertebral</td>
<td>Sternum</td>
<td>Ribs</td>
</tr>
<tr>
<td>2 Vertebral</td>
<td>Ribs</td>
<td>Sternum</td>
</tr>
<tr>
<td>3 Sternum</td>
<td>Vertebral</td>
<td>Ribs</td>
</tr>
<tr>
<td>4 Ribs</td>
<td>Vertebral</td>
<td>Sternum</td>
</tr>
</tbody>
</table>

169. Which of the following is not correct for potato family ?
(1) Ovary superior
(2) Seed endospermic
(3) Fruit legume
(4) Stamen epipetalous

170. Which characters of maize plant provide resistant to 'Maize stem borer' pest :-
(1) High aspartic acid
(2) Low nitrogen content
(3) Low sugar content
(4) All the above

171. In which of the following phases each chromosome is made up of two chromatids ?
(1) Prophase, Metaphase-II
(2) Prophase, Anaphase-II
(3) Telophase, Anaphase-I
(4) Metaphase, Anaphase
172. Mycorrhiza is a symbiotic association which helps in:-(1) Sucrose absorption (2) water absorption (3) Minerals absorption (4) Both 2 and 3

173. In cross between yellow round (YYRR) seeded plant with pure breeding pea plants having green wrinkled (yyrr) seed then find out the total seeds (plants) having yellow colour in F_2 generation:-(1) 12 (2) 10 (3) 14 (4) 11

174. When a pea plant with intermediate sized starch grain in seed is crossed with other plant having small sized starch grain in seed, the total number of seeds obtained in progeny is 630. What is correct for this progeny ?(1) 330 (large size), 330 (small size) (2) 330 (small size), 660 (medium size) (3) 315 (intermediate size), 315 (small size) (4) 158 (large size), 158 (small size), 314 (intermediate size)

175. What is the common characteristic feature between predation, parasitism and commensalism ?(1) At least one interacting species is harmed (2) Interacting species live closely together (3) Highly specific (4) Evolved in all taxonomic groups

176. Match column-A with column-B :-

<table>
<thead>
<tr>
<th>Column-A</th>
<th>Column-B</th>
</tr>
</thead>
<tbody>
<tr>
<td>i. Dorsal sclerite</td>
<td>a. Gonapophysis</td>
</tr>
<tr>
<td>ii. Ventral sclerite</td>
<td>b. Fore wing</td>
</tr>
<tr>
<td>iii. Phallomere</td>
<td>c. Tergites</td>
</tr>
<tr>
<td>iv. Tegmina</td>
<td>d. Sternite</td>
</tr>
</tbody>
</table>

177. Out of these how many statements are incorrect : A- In cyclostomata circulatory system is of open type. B- Operculum is absent in scoliodon C- Rana and Pavo belongs to same superclass D- Fertilization is internal in Hyla (1) One (2) Two (3) Three (4) Four
178. Every 100ml of Deoxygenated blood delivers approximately of CO₂ to alveoli:
   (1) 4ml (2) 40ml (3) 15ml (4) 19.6ml

179. Which of the following is present in Nucleoside:
   (1) Pentose sugar, Nitrogenous base
   (2) Pentose sugar
   (3) Nitrogenous base
   (4) Pentose sugar, Phosphate

180. 'Pomato' is developed by which tissue culture method:
   (1) Meristem culture (2) Embryo culture
   (3) Anther culture (4) Somatic hybridisation

Your moral duty is to prove that

**ALLEN is ALLEN**

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**CLASSROOM CONTACT PROGRAMME**
**TARGET : PRE-MEDICAL 2016**

**LEADER, ACHIEVER & ENTHUSIAST COURSE**

**SCHEDULE FOR MAJOR TEST (AIIMS)**
**[SESSION 2015-2016]**

<table>
<thead>
<tr>
<th>DATE</th>
<th>DAY</th>
<th>PHASE</th>
<th>SYLLABUS</th>
<th>PATTERN</th>
</tr>
</thead>
<tbody>
<tr>
<td>04/05/2016</td>
<td>WED</td>
<td>Enthuse, Leader &amp; Achiever (All Phases)</td>
<td>XI Full Syllabus</td>
<td>AIIMS</td>
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<tr>
<td>10/05/2016</td>
<td>TUE</td>
<td>Enthuse, Leader &amp; Achiever (All Phases)</td>
<td>XII Full Syllabus</td>
<td>AIIMS</td>
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<tr>
<td>16/05/2016</td>
<td>MON</td>
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<td>Full Syllabus</td>
<td>AIIMS</td>
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<td>21/05/2016</td>
<td>SAT</td>
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<tr>
<td>25/05/2016</td>
<td>WED</td>
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<td>Full Syllabus</td>
<td>AIIMS</td>
</tr>
</tbody>
</table>

**NOTE:**
1- Test Timing & Test Venue नियम और फाइलिंग नोटिस बोर्ड पर Display कर दिया जायेगा।
2- Test Schedule ALLEN की website (www.allen.ac.in) पर दिखाई देगा।
3- विद्यार्थी को यह schedule देख का इस बार परीक्षा का फिर न किया जाता है।
SPACE FOR ROUGH WORK / रफ का या के लिए जाह