### Important Instructions / महत्वपूर्ण सूचनाएँ

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.*
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1. A tunnel is dug along a diameter of the earth. If $M_e$ & $R_e$ are the mass & radius of the earth respectively. Then the force on a particle of mass $m$ placed in the tunnel at a distance $r$ from the centre is:

\[
(1) \frac{GM_m}{R_e^3} r \\
(2) \frac{GM_m}{R_e^3} \frac{m}{r} \\
(3) \frac{GM_m}{R_e} \frac{m}{r} \\
(4) \frac{GM_m}{R_e^2} \frac{m}{r}
\]

2. If the radius of the earth were shrink by 1% and its mass remaining the same, the acceleration due to gravity on the earth's surface would:

(1) Decrease by 2% 
(2) Remain unchanged 
(3) Increase by 2% 
(4) Becomes zero 

3. A and B are two identical spheres charge on them is 7$\mu$C and 1$\mu$C respectively. Now both are connected by a wire. Calculate flow of charge from A to B

(1) 8$\mu$C 
(2) 4$\mu$C 
(3) 3$\mu$C 
(4) 1.5$\mu$C

4. A rise of temperature of 4°C is observed in a conductor by passing a current. If the current is tripled, the rise temperature will be:

(1) 8°C 
(2) 12°C 
(3) 16°C 
(4) 36°C

5. Wheat stone bridge is balanced. Find ratio of electric power dissipated in $(P + Q)$ to $(R + S)$:

\[
(1) 1 : 1 \\
(2) R : P \\
(3) P^2 : Q^2 \\
(4) P^2 : R^2
\]
6. Which of the following quantities does not depend upon the orbital radius of the satellite.

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

7. Three charges \( q_1 = 1 \mu\text{C}, q_2 = 2 \mu\text{C} \) and \( q_3 = -3 \mu\text{C} \) and four surfaces \( S_1, S_2, S_3, \) and \( S_4 \) are shown in figure. The flux emerging through surface \( S_2 \) is \( \text{N}-\text{m}^2/\text{C} \) is

\[
\begin{align*}
(1) & \quad 36\pi \times 10^3 \\
(2) & \quad -36\pi \times 10^3 \\
(3) & \quad 36\pi \times 10^9 \\
(4) & \quad -36\pi \times 10^9
\end{align*}
\]

8. A point charge \( q \) is situated at a distance \( d \) from one end of a thin non-conducting rod of length \( L \) having a charge \( Q \) (uniformly distributed along its length) as shown in fig. Then the magnitude of electric force between them is:

\[
\begin{align*}
(1) & \quad \frac{1}{4\pi \varepsilon_0} \frac{qQ}{2d(d+L)} \\
(2) & \quad \frac{1}{4\pi \varepsilon_0} \frac{2qQ}{d(d+L)} \\
(3) & \quad \frac{1}{4\pi \varepsilon_0} \frac{qQ}{3d(d+L)} \\
(4) & \quad \frac{1}{4\pi \varepsilon_0} \frac{qQ}{d(d+L)}
\end{align*}
\]

9. Consider the four circuits shown in the figure given below. In which circuit the power dissipated is the greatest? (Neglect the internal resistance of the power supply)

\[
\begin{align*}
(1) & \quad E \quad R \quad R \quad R \\
(2) & \quad E \quad R \quad R \quad R \\
(3) & \quad E \quad R \quad R \quad R \\
(4) & \quad E \quad R \quad R \quad R
\end{align*}
\]
10. 

H⁺, He⁺ and O⁺⁺ are projected in uniform transverse magnetic field with equal accelerating potential, then ratio of their radii are respectively if their masses are 1 a.m.u., 4 a.m.u. and 16 a.m.u. respectively: -

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

11. In order to shift a body of mass \( m \) from a circular orbit of radius 3R to a higher radius 5R around the earth, the work done is:

\[
\begin{align*}
(1) & \quad \frac{3GMm}{5R} \\
(2) & \quad \frac{1 \ GMm}{15 \ R} \\
(3) & \quad \frac{GMm}{2R} \\
(4) & \quad \frac{GMm}{5R}
\end{align*}
\]

12. The electric potential (V) as a function of distance (x) [in meters] is given by \( V = (5x^2 + 10x - 9) \) Volt. The value of electric field at \( x = 1 \) m would be:

(1) 20 Volt/m
(2) 6 Volt/m
(3) 11 Volt/m
(4) –23 Volt/m

13. The potential of the point A is greater than that of B by 19 Volt. What is the potential difference in volts across the 3μF capacitor?

\[ \begin{array}{c|c|c|c|c|c}
A & \frac{2μF}{8V} & \frac{3μF}{15V} & \frac{4μF}{23V} & B \\
\end{array} \]

(1) 7
(2) 8
(3) 23
(4) 4

14. 32 cells, each of emf 3V, are connected in series and kept in a box. Externally, the combination shows an emf of 84 V. The number of cells reversed in the combination is:

(1) zero
(2) 2
(3) 4
(4) 8

15. A proton is moving on circular path with its constant angular speed then correct relation between its magnetic moment and angular momentum :-

\[
\begin{align*}
(1) & \quad \overline{M} = - \frac{eL}{2mp} \\
(2) & \quad \overline{M} = \frac{eL}{2mp} \\
(3) & \quad \overline{M} = \left( \frac{2e}{mp} \right) \frac{L}{3} \\
(4) & \quad \overline{M} = - \left( \frac{2e}{mp} \right) L
\end{align*}
\]

16. If the acceleration due to gravity at earth is 'g' and mass of earth is 80 times that of moon and radius of earth is 4 times that of moon, the value of acceleration due to gravity at the surface of moon will be:

(1) g
(2) \( g/20 \)
(3) \( g/5 \)
(4) 320g

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(1) g
(2) \( g/20 \)
(3) \( g/5 \)
(4) 320g
17. Four charges are arranged at the corners of a square ABCD, as shown. The force on a +ve charge kept at the centre of the square is

(1) zero
(2) along diagonal AC
(3) along diagonal BD
(4) perpendicular to the side AB

18. In which of the following stores maximum energy?

(1) $qa$
(2) $qa$ and $q_b$
(3) $q_a$
(4) $q_a$ and $q_b$

19. Two electrical bulbs marked 40 W, 220 V and 60 W, 220 V when connected in series across same voltage supply of 220 V, the effective power is $P_1$ and when connected in parallel, the effective power is $P_2$. Then $(P_1/P_2)$ is :-

(1) 0.5
(2) 0.48
(3) 0.24
(4) 0.16

20. A coil of 50 turns and 4 cm radius carries 2 A current then magnetic field at its centre is :-

(1) 3.14 mT
(2) 157 mT
(3) 15.7 mT
(4) 1.57 mT

21. A satellite moving round the earth in a circular orbit of radius r and speed v suddenly loses some of its energy. Then :-

(1) r will increase and v will decrease
(2) both r and v will decrease
(3) both r and v will increase
(4) r will decrease and v will increase

22. A satellite moving round the earth in a circular orbit of radius r and speed v suddenly loses some of its energy. Then :-

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(1) r will increase and v will decrease
(2) both r and v will decrease
(3) both r and v will increase
(4) r will decrease and v will decrease
22. Two free positive charges \(4q\) and \(q\) are a distance \(l\) apart. What charge \(Q\) is needed to achieve equilibrium for the entire system and where should it be placed from charge \(q\)?

(1) \(Q = \frac{4}{9}q\) (negative) at \(l/3\) distance

(2) \(Q = \frac{4}{9}q\) (positive) at \(l/3\) distance

(3) \(Q = q\) (positive) at \(2l/3\) distance

(4) \(Q = q\) (negative) at \(2l/3\) distance

23. A parallel plate capacitor with air between the plates has a capacitance of 9 pF. The separation between its plates is 'd'. The space between the plates is now filled with two dielectrics. One of the dielectrics has dielectric constant \(K_1 = 3\) and thickness \(\frac{d}{3}\) while the other one has dielectric constant \(K_2 = 6\) and thickness \(\frac{2d}{3}\). Capacitance of the capacitor is now:

(1) 1.8 pF  
(2) 45 pF  
(3) 40.5 pF  
(4) 20.25 pF

24. The current through a wire depends on time as \(i = (2+3t)\) mA. The charge crossing through a section of the wire in 1 min is:

(1) 40.20 C  
(2) 24.55 C  
(3) 12.75 C  
(4) 5.52 C

25. Magnetic field at point 'M' of given current distribution:

\[
\begin{align*}
(1) & \quad \frac{2\mu_0}{\pi} \\
(2) & \quad \frac{5\mu_0}{2\pi} \\
(3) & \quad \frac{2\mu_0}{\pi} \\
(4) & \quad \frac{\mu_0}{2\pi}
\end{align*}
\]
26. A body of mass m is kept at a small height h above the ground. If the radius of the earth is R and its mass is M, the potential energy of the body and earth system (with \( h = \infty \) being the reference position) is: -

\[
\begin{align*}
(1) & \quad \frac{GMm}{R} + mgh \\
(2) & \quad -\frac{GMm}{R} + mgh \\
(3) & \quad \frac{GMm}{R} - mgh \\
(4) & \quad -\frac{GMm}{R} - mgh
\end{align*}
\]

27. A charge q is placed in the middle of a line joining the two equal and like point charge Q. This charge q will remain in equilibrium for which value of q is:

\[
\begin{align*}
(1) & \quad \frac{Q}{4} \\
(2) & \quad \frac{Q}{4} \\
(3) & \quad \frac{Q}{\sqrt{3}} \\
(4) & \quad \text{All}
\end{align*}
\]

28. If the charge on a capacitor is increased by 2 C, the energy stored in it increases by 21%. The original charge on the capacitor (in coulomb) is:

\[
\begin{align*}
(1) & \quad 10 \\
(2) & \quad 20 \\
(3) & \quad 30 \\
(4) & \quad 40
\end{align*}
\]

29. A current of 1.6 A is flowing through a wire having cross-sectional area 1 mm². If density of free electrons in the material of the wire is \( 10^{29} \text{ per m}^3 \), the drift velocity of electrons will be:

\[
\begin{align*}
(1) & \quad 10^{-4} \text{ m/s} \\
(2) & \quad 10^{-3} \text{ m/s} \\
(3) & \quad 10^{-2} \text{ m/s} \\
(4) & \quad 0.1 \text{ m/s}
\end{align*}
\]

30. Magnetic field due to semi infinite length wire at point P:

\[
\begin{align*}
(1) & \quad B_p = \frac{\mu_0 I}{4\pi d} [\sin \theta + 1] \\
(2) & \quad B_p = \frac{\mu_0 d}{4\pi I} [\sin \theta] \\
(3) & \quad B_p = \frac{\mu_0 I}{4\pi d} [\sin \theta + \sin \theta] \\
(4) & \quad B_p = \frac{\mu_0 I}{4\pi d} [\sin 90 + \sin 90]
\end{align*}
\]
31. A planet of mass 'm' is moving in an elliptical orbit about the sun with time period 'T'. If 'A' be the area of orbit, then its angular momentum would be:

(1) \( \frac{2mA}{T} \)  
(2) \( mA \)  
(3) \( \frac{mA}{2T} \)  
(4) \( 2mAT \)

32. Two objects are rubbed against each other, the nature of electric force, when they are placed at some distance is:

(1) Attractive  
(2) Repulsive  
(3) Both (1) and (2)  
(4) Either (1) or (2)

33. A 30\( \mu \)F capacitor is charged by a constant current of 30 mA. If the capacitor is initially uncharged, how long does it take for the potential difference to reach 400 V?

(1) 0.1 s  
(2) 0.2 s  
(3) 0.3 s  
(4) 0.4 s

34. In the circuit shown in the adjoining figure, the reading of ammeter A is:

```
  2 Ω
  4 Ω
  0.3 Ω
  1.5 V
  12 Ω
```

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

35. In bio savart law direction of magnetic field is shown by -

\[ dB = \frac{\mu_0 I d\ell \times r}{4\pi r^3} \]

(1) \( r \times \mathbf{Id\ell} \)  
(2) \( \mathbf{Id\ell} \times r \)  
(3) (1) and (2)  
(4) None

36. A simple pendulum performs S.H.M about \( x = 0 \) with an amplitude A and time-period T. The speed of pendulum at \( x = \frac{A}{2} \) will be:

(1) \( \frac{A}{T} \)  
(2) \( \frac{\sqrt{3}\pi A}{T} \)  
(3) \( \frac{\sqrt{3}(\pi A)}{2T} \)  
(4) \( \frac{3\pi^2 A}{T} \)
37. Force between A and B is F. If 75% charge of A is transferred to B then force between A and B is:

\[
\begin{align*}
(1) \ & \frac{F}{4} \\
(2) \ & 4F \\
(3) \ & F \\
(4) \ & \text{None}
\end{align*}
\]

38. Three capacitors 1, 2 and 4\(\mu\)F are connected in series to a 10 volts source. The charge on the plates of middle capacitor is:

\[
\begin{align*}
(1) \ & 7 \ \mu\text{C} \\
(2) \ & \frac{40}{7} \ \mu\text{C} \\
(3) \ & \frac{20}{7} \ \mu\text{C} \\
(4) \ & \frac{1}{7} \ \mu\text{C}
\end{align*}
\]

39. The equivalent resistance between A and B in the figure is:

\[
\begin{align*}
(1) \ & R \\
(2) \ & \frac{2}{3} R \\
(3) \ & \frac{5}{2} R \\
(4) \ & \frac{5}{2} R
\end{align*}
\]

40. If wire of length L form a loop of radius R and have n turn. Find magnetic field at centre of loop. Current flow in loop is I :

\[
\begin{align*}
(1) \ & \frac{\mu_0}{4\pi} \frac{1}{R^2} \times L^2 \\
(2) \ & \frac{\mu_0}{4\pi} \frac{1}{R^2} \times L \times n^2 \\
(3) \ & \frac{\mu_0 I}{4\pi} \frac{4\pi^2 n^2}{L} \\
(4) \ & \frac{\mu_0 I}{4\pi} \frac{4\pi^2 n^2}{L}
\end{align*}
\]

41. For a satellite if the time of revolution is T, then its K.E. is proportional to:

\[
\begin{align*}
(1) \ & \frac{1}{T} \\
(2) \ & \frac{1}{T^2} \\
(3) \ & \frac{1}{T^3} \\
(4) \ & T^{-2/3}
\end{align*}
\]
42. Two conductors of the same shape and size. One of copper and the other of aluminium (less conducting) are placed in a uniform electric field. the charge induced in aluminium.
(1) Will be less than in copper
(2) Will be more than in copper
(3) Will be equal to that in copper
(4) Will not be connected with copper

43. Charge 'q' on a capacitor varies with voltage 'V' as shown. The area of \(\Delta OPM\) represents:

(1) capacitance
(2) capacitive reactance
(3) magnetic field between the plates
(4) energy stored in the capacitor

44. If an electric heater is rated at 1000 W, then the time required to heat one litre of water from 20°C to 60°C is:

(1) 1 min 24 sec
(2) 2 min 48 sec
(3) 4 min 17 sec
(4) 5 min 36 sec

45. An electron moving with a speed \(u\) along the positive x-axis at \(y = 0\) enters a region of uniform magnetic field \(B = -B_0\hat{k}\) which exists to the right of y-axis. The electron exits from the region after some time with the speed \(v\) at co-ordinate \(y\), then

(1) \(v > u, y < 0\)
(2) \(v = u, y > 0\)
(3) \(v > u, y > 0\)
(4) \(v = u, y < 0\)
46. \[ \ce{CH_3-CH_2-CH_2-CH_2-Br} \xrightarrow{\text{Fe, } \Delta} \ce{CH_3-CH=CH=CH_2} \] Y is :-

(1) \ce{CH_3-OH}  \hspace{1cm} (2) \ce{CH_3-CH_2-OH}  \hspace{1cm} (3) \ce{CH_3-COOH}  \hspace{1cm} (4) \ce{CH=O}

47. Which of the followings is most reactive toward hydrolysis :-

(1) \ce{Cl}\ce{C-Cl}  \hspace{1cm} (2) \ce{Cl}\ce{C-NO_2}  \hspace{1cm} (3) \ce{C-Cl\ce{NO_2}}  \hspace{1cm} (4) \ce{C-Cl\ce{NO_2\ce{NO_2}}}

48. Number of chiral centre in the given compound is

(1) 2  \hspace{1cm} (2) 3  \hspace{1cm} (3) 4  \hspace{1cm} (4) 5

49. Consider the following reaction

\[ \ce{CH_3-CH_2-CH_2-CH_3 \xrightarrow{\text{C=C, H}} CH_3-C=CH_3} \]

Which of the following base will give the best yield of the alkene II as the major product -

(1) Alc KOH  \hspace{1cm} (2) \ce{C_2H_5O^-}  \hspace{1cm} (3) \ce{(CH_3)_3CO^-}  \hspace{1cm} (4) \ce{NaNH_2}

[Diagram of the reaction and product structures]

[Take it Easy and Make it Easy]
50. Which of the following product is monomeric unit of Bakelite, formed in Lederer-Manasse reaction?

(1) \( \text{OH} \quad \text{CH}_3 \)

(2) \( \text{OH} \quad \text{CH}_2\text{OH} \)

(3) \( \text{CH}_2\text{OH} \)

(4) \( \text{OH} \quad \text{OH} \)

51. Ph\(_3\text{CH}\)\(\rightarrow\) \(\text{CH}_3\) \(\text{Excess Cl}/\text{hv}\) gives Product

The main product will be :-

(1) \( \text{Cl} \quad \text{C} \quad \text{CCl}_3 \)

(2) \( \text{Cl} \quad \text{CH} \quad \text{C} \quad \text{Cl} \)

(3) \( \text{Cl} \quad \text{C} \quad \text{Cl} \quad \text{CCl}_3 \)

(4) None of these

52. \( \text{CH}_3\text{CN} \quad \text{Na}+\text{C}_2\text{H}_5\text{OH} \rightarrow x \)

The compound \( x \) is :-

(1) \( \text{CH}_3\text{CONH}_2 \)

(2) \( \text{CH}_3\text{CH}_2\text{NH}_2 \)

(3) \( \text{C}_2\text{H}_6 \)

(4) \( \text{CH}_3\text{NH}–\text{CH}_3 \)

53. The two structures I & II represents :

(I) (II)

(1) Conformational isomers

(2) Stereoisomers

(3) Structural isomers

(4) Identical
54. The reaction conditions leading to the best yield of C₂H₅Cl are

(1) C₂H₆ + Cl₂ → \( \Delta \) (excess)

(2) C₂H₆ + Cl₂ → \( \Delta \) (less)

(3) C₂H₆ + Cl₂ → \( \Delta \) (excess)

(4) C₂H₆ + Cl₂ → \( \Delta \) (less)

55. C₂H₄ → \( \Delta \) (NaOH)

(1) CH₄

(2) CH₃–CH₃

(3) C₂H₈

(4) C₄H₁₀

56. MgCl₂ + OH⁻ → (P)

[D] is –

(1) CH₄

(2) CH₃–CH₃

(3) C₂H₈

(4) C₄H₁₀

57. CH₃–C–CH₃ → ?

CH₃

(1) O

(2) O

(3) O

(4) O

58. Which of the following is strongest acid?

(1) SO₃H

(2) SO₃H

(3) SO₃H

(4) SO₃H
59. COCH₃

X can be

(1) NH₂ – NH₂ / KOH
(2) Zn – Hg / HCl
(3) Red P + HI
(4) All

60. Which of the following compound will form 2°-alcohol when treated with Grignard reagent followed by hydrolysis:

(1) H – C – H
(2) CH₃ – C – H
(3) CH₃ – C – CH₃
(4) CH₃ – C – OH

61. When ethyl iodide is heated with silver nitrite the product obtained is:

(1) C₂H₅ – Ag
(2) Ag-O-NO₂
(3) C₂H₅O–NO₂
(4) C₂H₅–NO₂

62. Primary and secondary amines can be distinguished by:

(1) Hoffmann’s mustard oil reaction
(2) carbylamine reaction
(3) Hinsberg reagent
(4) All

63. Which of the following is aromatic compound?

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

64. In which of the reaction antimarkovnikoff product is form:

(1) CF₃CH=CH₂ → HCl
(2) ClCH=CH₂ → HCl
(3) CH₃OCH=CH₂ → HCl
(4) None
65. \[ \text{C}_6\text{H}_5 + \text{HNO}_3(\text{conc.}) \rightarrow \text{H}_2\text{SO}_4 \rightarrow A \] 
\[ \text{NaNO}_2 + \text{HCl} \rightarrow \text{C}_6\text{H}_5\text{O}_2\text{H}^+ \rightarrow D \]

What is D−?

(1) \[ \text{NH}_2 \]
(2) \[ \text{OH} \]
(3) \[ \text{Cl} \]
(4) \[ \text{COOH} \]

66. Compare the rate of reaction with AgNO_3:

(i) \[ \text{Br} \]
(ii) \[ \text{Br} \]
(iii) \[ \text{Br} \]

(1) i > ii > iii
(2) ii > iii > i
(3) iii > ii > i
(4) ii > i > iii

67. What is the product obtained in the following reaction:

\[ \text{NO}_2 \text{SnHCl} \rightarrow ? \]

(1) \[ \text{NHOH} \]
(2) \[ \text{NH}_2 \]
(3) \[ \text{N} \text{N} \]
(4) \[ \text{N=N} \text{O} \]

68. Which of the following show keto-enol isomerism:

(1) \[ \text{O} \]
(2) \[ \text{O} \]
(3) \[ \text{O} \text{Cl} \]
(4) \[ \text{O} \text{Cl} \]

65. \[ \text{C}_6\text{H}_5 + \text{HNO}_3(\text{conc.}) \rightarrow \text{H}_2\text{SO}_4 \rightarrow A \] 
\[ \text{NaNO}_2 + \text{HCl} \rightarrow \text{C}_6\text{H}_5\text{O}_2\text{H}^+ \rightarrow D \]

Which of the following show keto-enol isomerism:

(1) \[ \text{O} \]
(2) \[ \text{O} \]
(3) \[ \text{O} \text{Cl} \]
(4) \[ \text{O} \text{Cl} \]
69. X, Y, Z reaction are respectively –
(1) Simple hydration reaction
(2) Hydroboration oxidation, hydration and oxymercuration demercuration
(3) Hydroboration oxidation, oxymercuration demercuration and hydration
(4) Oxymercuration demercuration, hydroboration oxidation and hydration

70. \[
\begin{align}
X + O_2 &\rightarrow A^{-} H_2O/H^+ \rightarrow Y + CH_3C=CH_3 \\
A &\rightarrow CH_3OCH_3 \\
&\rightarrow CH_3OCH_2CH_3 \\
&\rightarrow CH_3OCH_2CH_2CH_3
\end{align}
\]

A is –
(1) H–O–O–C–CH_3
(2) O=C–CH–CH_3
(3) O–C–CH–CH_2
(4) O–CH–C–CH_2

71. Consider the following reaction –
\[
CH_2=CHCl \rightarrow CH_2=CHOCH_3
\]
The mechanism of reaction will be :-
(1) SN^1  (2) SN^2  (3) E_2  (4) E_1

72. In the chemical reaction
\[
CH_2Cl \rightarrow AgCN \rightarrow H/Pd \rightarrow (A) \rightarrow (B)
\]
What is the structure of B :-
(1) CH_3–NH_2  (2) CH_3–NH–CH_3  
(3) CH_2–C–NH_2  (4) CH_3–CH_2–CH_2
73. Arrange these compounds in decreasing order of basic strength

(i) \( \text{NH}_2 \)  
(ii) \( \text{NH}_2 \text{NO}_2 \)  
(iii) \( \text{NH}_2 \text{CN} \)  
(iv) \( \text{NH}_2 \text{CH}_3 \)

(1) (i) > (ii) > (iii) > (iv)  
(2) (ii) > (iii) > (i) > (iv)  
(3) (iv) > (i) > (iii) > (ii)  
(4) (iv) > (i) > (ii) > (iii)

74. Which of the following give Bad smell when treated with \( \text{CHCl}_3 / \text{KOH} \)?

(1) \( \text{NH}_2 \)  
(2) \( \text{CH}_3 - \text{NH} - \text{CH}_3 \)  
(3) \( \text{NH} - \text{CH}_3 \)  
(4) \( \text{NH} - \text{CH}_3 \)

75. Which of the following will not give D.N.P. test?

(1) \( \text{CH}_3 - \text{CHO} \)  
(2) \( \text{CH}_3 - \text{CO} - \text{CH}_3 \)  
(3) \( \text{CH}_3 - \text{O} - \text{CH}_3 \)  
(4) \( \text{CHO} \)

76. High yield of aryl halide is formed in :-

(1) \( \text{OH} + \text{PCl}_5 \xrightarrow{\Delta} \)  
(2) \( \text{OH} + \text{Cl}_2 \xrightarrow{\text{Fe}} \)  
(3) \( \text{CH} = \text{CH}_2 \xrightarrow{\text{Br}_2/\text{CCl}_4} \)  
(4) All
77. The IUPAC name of \( \text{C} \ - \text{NH} \ - \text{C}_6\text{H}_5 \) is:

(1) N-Cyclohexyl benzamide
(2) N-Phenyl-N-cyclohexylmethanamide
(3) N-Phenylcyclohexane carboxamide
(4) N-Cyclohexyl-N-phenylmethylamide

78. Which of the following carbocation is least stable

(1) \( \text{CH}_2^+ \)
(2) \( \text{CH}_3^+ \)
(3) \( \text{CH}_2^+ \)
(4) \( \text{CH}_3^+ \)

79. In the reaction product D is,

\[ \text{CH}_3\text{CH}_2\text{COOH} \xrightarrow{\text{Br}_2/\text{CCl}_4} \text{A} \xrightarrow{\text{KCN}} \text{B} \xrightarrow{\text{H}_2\text{O}} \text{C} \xrightarrow{\Delta} \text{D} \]

78. निम्न में से कौन-सा नाम इम्युनाइटी में नहीं होता?

(1) \( \text{CH}_3\text{CH}_2\text{Br} \)
(2) \( \text{CH}_3\text{CH}_2\text{NH}_2 \)
(3) \( \text{CH}_3\text{CH}_2\text{COBr} \)
(4) \( \text{CH}_3\text{CH}_2\text{CH}_2\text{NH}_2 \)

80. Starting from propanoic acid the following reactions were carried out as following

\[ \text{CH}_3\text{CH}_2\text{COOH} \xrightarrow{\text{SOCl}_2} [\text{X}] \]

\[ \xrightarrow{\Delta \text{NH}_3}[\text{Y}] \xrightarrow{\text{Br}_2/\text{KOH}} [\text{Z}] \]

Product [Z] will be?

(1) \( \text{CH}_3\text{CH}_2\text{Br} \)
(2) \( \text{CH}_3\text{CH}_2\text{NH}_2 \)
(3) \( \text{CH}_3\text{CH}_2\text{COBr} \)
(4) \( \text{CH}_3\text{CH}_2\text{CH}_2\text{NH}_2 \)
81. What will be the product in the following reaction:

82. The IUPAC name of the given compound $\text{CH}_3 - \text{CH} = \text{CH} - \text{COOC}_2\text{H}_3$ is:
(1) Ethyl-1-butenoate
(2) Ethyl-2-butenoate
(3) Ethyl propenoate
(4) Propene ethyl methanoate

83. Which of the following orders is correct for heat of hydrogenation of these compounds?
(1) I > II > III
(2) III > II > I
(3) II > III > I
(4) III > I > II

84. $\text{C}_2\text{H}_5\text{Br} \xrightarrow{\text{aq. NaOH}} \text{X} \xrightarrow{\text{Na}_2\text{Cr}_2\text{O}_7, \text{H}_2\text{SO}_4} \text{Y}$

85. $\text{ClBr} \xrightarrow{\text{Mg, THF}} \text{A} \xrightarrow{\text{CO}_2, \text{H}^+} \text{B} \xrightarrow{\text{CO}_2, \text{H}^+} \text{C}$

Cl

Br

(1) COOH

(2) Cl

(3) COOH

(4) Br
86. \(\text{CH}_3\text{O}\) is prepared best by the reaction:

1. \((\text{CH}_3)_3\text{C}\text{-Br} + \text{CH}_3\text{OK} \rightarrow\)
2. \((\text{CH}_3)_3\text{C}\text{-OH} \xrightarrow{\text{H}_2\text{SO}_4/170°C}\)
3. \((\text{CH}_3)_3\text{COK} + \text{CH}_3\text{-Br} \rightarrow\)
4. \((\text{CH}_3)_2\text{C=CH}_2 \xrightarrow{\text{Conc. H}_2\text{SO}_4}\)

87. How many cyclic isomer are possible for \(\text{C}_4\text{H}_6\)?

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

88. Which of the following is not the product of dehydration of \(\text{OH}\):

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

89. Which of the following reagents will convert propionic acid to 1-propanol –

(1) \(\text{NaBr}\) (2) \(\text{H}^\circ/\text{H}_2\text{O}\) (3) \(\text{Cr}_2\text{O}_3\) (4) \(\text{LiAlH}_4\)

90. In the reaction:

\(\text{C} = \text{O} + \text{C} = \text{O} \xrightarrow{\partial\text{H}_2\text{A}} [\text{X}]\)

Product \([\text{X}]\) will be:

- (1)
- (2)
- (3)
- (4)
91. All the following statement about ZIFT are correct but one is wrong find out that - 

(1) It is zygote intra fallopian tube transfer 
(2) Zygote is transferred in fallopian tube after IVF 
(3) Early embryos upto 8 blastomeres can also be transferred in to fallopian tubes. 
(4) Embryo with more than 8 blastomeres are also transferred in the fallopian tubes.

92. Wrong statement with respect to the female reproductive system is : 

(1) Each ovary is covered by a thin epithelium with stroma enclosed 
(2) Stroma of ovaries has two parts cortex and medulla 
(3) Oviducts, uterus and vagina constitute the major accessory glands 
(4) The part of fallopian tube closer to the ovaries is the funnel shaped infundibulum

93. What is aneuploidy :-

(1) Loss of a segment of DNA 
(2) Loss or gain of one complete chromosome 
(3) Change of sequence of genes on chromosome 
(4) Deletion or insertion of singlet base pair of DNA

94. In a dihybrid cross, 2000 individuals are produced in F2 generation. Approximately, how many will be phenotypically different from parents?

(1) 1250 (2) 1000 (3) 1500 (4) 750

95. Which one of the following statements is not related to quantitative inheritance ?

(1) Continuous pattern 
(2) Many intermediate 
(3) Regulate by one gene only 
(4) Additive effect of genes

96. In Mirabilis plant inheritance of leaf colour is due to plastids. If pollen grain of green branch is used to pollinated the stigma of variegated branch flower, the result is :-

(1) Only green leaves 
(2) Only variegated leaves 
(3) Green, pale and variengated leaves 
(4) Both green and variegated leaves
97. An autosomal character present in both sexes, but more in one sex, then such type of character is known as:
(1) Sex linked
(2) Sex influenced character
(3) Sex limited character
(4) All

98. Biogas is the mixture of gases produced by the microbial activity. The type of the gas produced depends upon:
(1) Type of microbes
(2) Type of organic substrate/waste
(3) Size of digester
(4) (1) & (2) both

99. Choose the correct sequence of microbes involved in biogas production?
(1) Fermentative microbes, decomposers, methanogens
(2) Decomposers, Methanogens, Putrefying microbes
(3) Putrefying microbes, methanogens, saprophytic microbes
(4) Decomposers, fermentative microbes, methanogens

100. Which of the following evidences does not favour the Lamarckian concept of inheritance of acquired characters?
(1) Absence of limbs in snakes
(2) Presence of webbed toes in aquatic birds
(3) Lack of pigment in cave-dwelling animals
(4) Sickle cell anaemia and malarial resistance

101. What would happen if vasa deferentia of man are cut?
(1) Sperms are non-nucleate
(2) Spermatogenesis does not occur
(3) Semen is without sperms
(4) Sperms are nonmotile

102. Which is an incorrect statement?
(1) Blastomeres in the blastocyst are arranged into an outer layer trophoblast
(2) Trophoblast layer gets attached to the endometrium
(3) The inner cell mass get differentiated into placental tissue
(4) Blastocyst embedding into the endometrium is called implantation
103. The recent ancestors of modern man were :-
(1) Java ape man and Peking man
(2) Peking man and Rhodesian man
(3) Rhodesian man Cromagnon man
(4) Cromagnon man and Neanderthal man

104. In *Mirabilis jalapa* two plants with pink flowers were hybridized. In progeny red, pink and white flower are produce in the proportion of 1 red, 2 pink and 1 white. What could be the genotype of two plants used for hybridization? Flower colour red is determined by RR and white by rr gene :-
(1) RR  (2) rr  (3) Rr  (4) rrrr

105. Given below is the diagram related to sickle-cell anaemia, which is an autosomal recessive trait. In this identify X, Y and Z :-

![Diagram of Sickle-cell Hb (S)gene]

(1) X – CAC ; Y – GTG ; Z – Val
(2) X – CAC ; Y – GTG ; Z – Phe
(3) X – GTG ; Y – CAC ; Z – Val
(4) X – CAC ; Y – GTG ; Z – His

106. Extra nuclear genes occur in :-
(1) Mitochondria and plastids
(2) ER and Cytoplasm
(3) Ribosome
(4) Ribosome and Mitochondria

107. How many type of gametes will be produced by ♀ *Drosophila* having following arrangement of two genes (Y⁺ & W⁺) on X-chromosomes :-

♀ Y⁺ W⁺
(1) 2  (2) 4  (3) 1  (4) 8

103. अंगुल, निक नाना के निकात सम पुःव जपे (1) झा वर्ष मानत्र जिंग ग मान
(2) जिंग मानत्र जिंग रो डी जिंग मानत्र
(3) जिंग रो जिंग मानत्र जिंग रो मानत्र
(4) जिंग मानत्र जिंग जिंग जिंग रो निन्ि राह जिंग मानत्र

104. निगा जिल्लास्क वके दाना पै धाये (दाने नाने घु ला बी पू के बीच सेवन का जा है।) संलग्ने लें लाल, गुरे दाने दु पू बोला लाल बी बी दु पू बोला अमु अंत में नाना हाथ हैं।) संकल्प में द घोर गें लाल दाने नाम खाने बी मु बोला लाल लाल निन्ि राम जेन का। सामे दा जिनका जा साक्षात्त हैं।
(1) RR  (2) rr  (3) Rr  (4) rrrr

105. नीचे दिया गया जिन फ्रांस-सेल्सी विमेंट वाला विं उन्होंने जो एक अंत के में मला अमु बी लाल रू, घं बी झे जो के प्रा विनें

♀ Y⁺ W⁺
(1) 2  (2) 4  (3) 1  (4) 8
108. E.coli cells with a mutated Z gene of the lac operon cannot grow in medium containing only lactose as the source of energy because:
(1) The lac operon is constitutively active in these cells
(2) They cannot synthesize functional β-galactosidase
(3) In the presence of glucose E.coli cells do not utilize lactose
(4) They cannot transport lactose from the medium into the cell

109. What is true for Bt-toxin:
(1) Bt-toxin protein exist as active toxin in bacterium
(2) Bt-toxin is converted in to an active toxin due to acidic pH of gut of insect
(3) Bt-toxin is converted in to an active toxin due to alkaline pH of gut of insects
(4) Bt-toxin is formed by Biotechnology

110. Which of the following describes correctly the homologous structures:
(1) Organs with anatomical similarities, but performing different or same functions
(2) Organs with anatomical dissimilarities but performing same function
(3) Organs that have no function now, but had an important function in ancestors
(4) Organs appearing only in embryonic stage and disappearing later in the adult

111. Which of the following statement is incorrect?
(1) Sertoli cells provide nutrition to germ cells.
(2) Each testicular lobule contains straight three to five seminiferous tubules.
(3) Scrotum helps in maintaining low temperature of testes.
(4) Spermatogonia undergo meiotic division finally leading to sperm formation

112. Which of the following part of sperm is called 'energy chamber'?
(1) Head
(2) Tail
(3) Middle piece
(4) Neck

113. Which of the following are required to maintenance of Hardy-Weinberg equilibrium?
(1) Presence of natural selection and mutation
(2) Presence of mutation and nonrandom mating
(3) Absence of genetic drift and random mating
(4) Absence of genetic drift and presence of random mating
114. In Antirrhinum majus when a pink flowered plant is crossed with red flowered plant then total 120 plants are obtained. What will be percentage of phenotype in offspring :-

(1) 100% red flowered
(2) 50% white flowered
(3) 75% pink flowered
(4) 50% pink flowered

115. If there are four allelic forms of the gene controlling ABO blood group then what will be the number of possible genotype?

(1) 6
(2) 10
(3) 2
(4) 14

116. Given diagram show Morgan experiment between body colour and eye colour, what will be true for this experiment ?

(1) The strength of linkage between y and w is high
(2) Crossing over between y and w is high
(3) The strength of linkage between y and w is low
(4) Large number of recombination are produced
117. In a population an autosomal recessive disorder is present in 60 individual out of 6000. What is the number of homozygous normal (AA) offspring in population: -
(1) 4860  (2) 5460  (3) 1000  (4) 2000

118. Find an incorrect statement with respect to findings of HGP: -
(1) Dystrophin protein gene is largest gene of human genome
(2) Chromosome-Y has minimum 231 genes
(3) SNP's were identified at about 2.4 million locations.
(4) The functions are unknown for over 50% of discovered genes.

119. Name the blank space A, B, C and D given in the following table: -

<table>
<thead>
<tr>
<th>Microbes name</th>
<th>Commercial product</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Lactic acid</td>
</tr>
<tr>
<td>B</td>
<td>Cyclosporin-A</td>
</tr>
<tr>
<td>Penicillium notatum</td>
<td>C</td>
</tr>
<tr>
<td>D</td>
<td>Pectinase</td>
</tr>
</tbody>
</table>

(1) A - Lactobacillus  B - Trichoderma (fungi)
C - Penicillin        D - Statim
(2) A - Trichoderma   B - Statim
C - Lactobacillus     D - Penicillin
(3) A - Lactobacillus B - Trichoderma (fungi)
C - Penicillin        D - Aspergillus
(4) A - Lactobacillus B - Trichoderma
C - Penicillin        D - Streptococcus

120. Match the column-I (Plants) with column-II (Pollinating agents) and select the correct option: -

**Column-I (Plant)** | **Column-II (Pollinating agents)**
---|---
(A) Callistemon | i Ants
(B) Zeamays | ii Bats
(C) Kigelia | iii Sun bird
(D) Acacia | iv Air

(1) A - iii ; B - iv ; C - i ; D - ii
(2) A - ii ; B - iii ; C - iv ; D - i
(3) A - iii ; B - iv ; C - ii ; D - i
(4) A - i ; B - iv ; C - iii ; D - ii
121. An antiprogestrone drug that can be used to induce MTP and act as an emergency contraceptive is:-
   (1) Mifepristone
   (2) Nor ethisterone enathate
   (3) Estrogen
   (4) Minipill

122. If not timely detected, STD's can result in:
   (1) PID, ectopic pregnancies, cancer
   (2) Still births, zygotic twins
   (3) Cancer of cervix, fraternal twins
   (4) All of the above

123. Find out unmatched –
   (1) Rhesus → Old world monkey
   (2) Australopithecus → Fruit eater
   (3) Neanderthal man → Well develop chin
   (4) Homo sapiens sapiens → Thumb opposable

124. In a medico-legal case of accidental interchange between two babies in a hospital, the baby of blood group 'A' could not be rightly given to a couple:
   (1) With both husband and wife of group 'O'
   (2) Husband of group 'O' and wife of group 'A'
   (3) Husband of group 'A' and wife of group 'O'
   (4) Both husband and wife of group 'A'

125. In pedigree analysis the symbol represents:
   (1) Affected individual of unspecified sex
   (2) Affected intersex
   (3) Still birth
   (4) Affected gynandromorph

126. Select the incorrect statements:
   (a) Linked genes causes absolute lethality
   (b) Ratio of monohybrid & dihybrid test cross are same
   (c) F2 ratio in codominance & incomplete dominance are same
   (d) Sex of male Drosophila is dependent on Y-chromosome

   (1) a & b
   (2) b & c
   (3) a, b & d
   (4) All of these

127. If in a population, frequency of organisms of recessive trait is 25%, then calculate the frequency of recessive allele.
   (1) 25%  (2) 50%  (3) 75%  (4) 5%
128. Bacterial colonies that have a foreign DNA fragment inserted into the plasmid will appear white, because-
(1) X-gal can be cleaved by β-galactosidase
(2) Gal gene shows insertional inactivation due to insertion of foreign DNA
(3) Gal gene is active
(4) X-gal can be cleaved by permease

129. Post pollination development of pollen grain is called :-
(1) Ex-situ
(2) In-situ
(3) Both (1) & (2)
(4) In-vitro

130. A scion is grafted to a stock. The quality of fruits produced will be determined by the genotypes of :-
(1) Stock
(2) Scion
(3) Both stock & scion
(4) Neither stock nor scion

131. Match the following and choose the correct options :-

| (A) Trophoblast | (i) Embedding of blastocyst in the endometrium |
| (B) Cleavage | (ii) Group of cells that would differentiate as embryo |
| (C) Inner cell mass | (iii) Outer layer of blastocyst attached to the endometrium |
| (D) Implantation | (iv) Mitotic division of zygote |

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

132. Mismatch is :
(1) Interstitial cells - androgens
(2) Leydig cells - line the seminiferous tubules
(3) Sertoli cells - nourishment to the germ cells
(4) Interstitial space - immunologically competent cells

133. 'Chief agent of variation :-
(1) Natural selection
(2) Mutation
(3) Acquired character
(4) Sexual reproduction
134. If the modified allele produce normal enzyme then which statement is not true?

1. It will produce phenotype similar to unmodified allele
2. It will be responsible for transformation of substrate into product
3. Modified allele is not equivalent to unmodified allele
4. Modified allele is equivalent to unmodified allele

135. Which statement is not true?

1. It will produce phenotype similar to unmodified allele
2. It will be responsible for transformation of substrate into product
3. Modified allele is not equivalent to unmodified allele
4. Modified allele is equivalent to unmodified allele

136. In Drosophila, the following crossing over percentages were found between the given genes:

<table>
<thead>
<tr>
<th>Gene</th>
<th>Gene</th>
<th>C. 0%</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>b</td>
<td>2.8</td>
</tr>
<tr>
<td>a</td>
<td>c</td>
<td>7.8</td>
</tr>
<tr>
<td>d</td>
<td>b</td>
<td>8.0</td>
</tr>
<tr>
<td>d</td>
<td>c</td>
<td>3.0</td>
</tr>
</tbody>
</table>

What is the order of these genes?

1. a-b-d-c
2. b-a-c-d
3. b-a-d-c
4. a-b-c-d

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What is the order of these genes?

1. a-b-d-c
2. b-a-c-d
3. b-a-d-c
4. a-b-c-d

138. If we ligate a foreign DNA at the Bam HI site in pBR322, then the recombinant plasmid will:

1. Show tetracycline resistance only
2. Show ampicillin resistance only
3. Will grow well on tetracycline containing medium
4. Will not grow on ampicillin containing medium
139. Epicotyl is:
(1) Portion of embryonal axis below the level of cotyledons
(2) Portion of embryonal axis above the level of cotyledons
(3) Part of radicle
(4) Part of embryosac

140. Male sex organ is stamen and the female sex organ is carpel or pistil in these plants. They produce female gametophyte made of egg apparatus, antipodal cells and polar nuclei and male gametophyte made of tube cell and two male gametes. Which of the following is also a very important unique event occurring in these plants:
(1) Formation of haploid endosperm for providing nourishment to developing embryo
(2) Double fertilisation and triple fusion
(3) Presence of vascular tissue and formation of seeds
(4) Both (2) & (3)

141. Which of the following hormones is not secreted by placenta?
(1) hCG
(2) Estrogens
(3) Progesterone
(4) LH

142. This graph indicates which type of natural selection:

<table>
<thead>
<tr>
<th>Natural Selection</th>
<th>Peak shifts in one direction</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Directional</td>
<td>(2) Stabilising</td>
</tr>
<tr>
<td>(3) Disruptive</td>
<td>(4) None</td>
</tr>
</tbody>
</table>

143. Many bacteria are now resistant to penicillin because
(1) Hospital environment inhibits competition among bacteria.
(2) Penicillin triggers the synthesis of resistant proteins
(3) Penicillin cause gene mutation
(4) Previously resistant forms survived and reproduced better than non resistant forms

144. Time Management is Life Management

---

139. बी ज्यादा परिक्रमक है :-
(1) बी ज्यादा के रूप से नो चे ४५° पो हाला जा ४५° गा।
(2) बी ज्यादा के रूप से जा ४५° पो हाला जा ४५° गा।
(3) मूल लें कुरंब जा ४५° गा।
(4) पूरा परिक्रमक जा ४५° गा।

140. इन प्रदेश में नर जान अंगु प्रके सकता। मादा जान अंगु अह नव निश्चित के रहते है, वे ध्रुवीय वी ये न-ध्रुवीय, जो विकास एं (प्रकृति व भौतिक विकास) का। आड़ सुध चले। मादा युग मके ३ ध्रुवीय बनाते हैं। इसे 'दो' ब फूला (व्यक्तित्व) के विकास बना नरयुग मके दुध्रुवीय बनता है। इन प्रदेश में निम्न ने से कौन फूला जा अर महत्व पूरा लाश और रचना जाती है जो अजय में नहीं हैं:
(1) विकास ते रहे ५५° प चे चौं देने के लिए
(2) पूरा प चा जा बनाना
(3) विनिमय घन व जिन्सेस लाख
(4) वह (३) दे नाला।

141. निम्न ने से के नया हाम में न आज्ञा द्वारा रास्ता चित्र नहीं है?
(1) hCG
(2) फटे जा
(3) प्रेग़्नेंट रो न
(4) LH

142. क्या एक फिक्सड का रो का फ्राक्शन वर्ग के अवधि त कला है?

<table>
<thead>
<tr>
<th>Natural Selection</th>
<th>Peak shifts in one direction</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) दिशा र मक</td>
<td>(2) रहता देव का तरीका</td>
</tr>
<tr>
<td>(3) विचारित</td>
<td>(4) को है नहीं</td>
</tr>
</tbody>
</table>

143. अ जले अंक हां जे वा पृ. पै नी का का का लिये प्रतियो घाल बो एक प्रकार:
(1) विस्तार से या वर्ग जे वा पृ. वा एक प्रतियो घाल संभाल करता है।
(2) पै नी का का प्रति घाल बो एक प्रतियो घाल संभाल करता है।
(3) पै नी का का ज़ै उ वर्ग वर्ग क है।
(4) पूरा घाल प्रति घाल बो एक प्रतियो घाल बो एक प्रतियो घाल संभाल करता है।
144. Flower colour is purple in sweet pea due to non-allelic interaction between two dominant genes C & P. Plant with CCpp genotype will have which of the following correct explanation?
a - Flower colour is white
b - No synthesis of chromagen
c - Raw materials are metabolised into chromagen.
d - Chromagen metabolism will be further stopped.
e - Crossing with heterozygous purple flowered plant will yield equal percentage of purple and white flowered plants.
(1) a, c, d and e
(2) All are correct except ‘d’
(3) a, b and e
(4) b, c, d & e

145. Given below is a pedigree of a family suffering from a genetical disorder.

After observing the inheritance pattern, find out that which of the following disorder can produce such type of pedigree?
(1) G-6-PD  (2) Colourblindness  (3) Haemophilia  (4) Pseudoricketes

146. All the given statements are correct regarding the phenomenon of linkage, except :-
(1) A completely linked dihybrid will give a ratio of 9 : 7 when selfed
(2) Male Drosophila shows complete linkage
(3) Number of linkage group in E.coli is one
(4) A linkage in cis arrangement is likely to produce more parental types even if a crossing over occurs

147. Calvin Bridges stated that instead of XY chromosomes, sex is determined by the genic balance. What would be the sex of drosophila having XX + 3A & XY + 3A karyotype respectively:
(1) Intersex & Metafemale
(2) Metafemale & Intersex
(3) Intersex & Normal male
(4) Intersex & Meta male
148. In genetic engineering, *Agrobacterium* and retrovirus are used as a vector for cloning genes in plants and animals, because:

1. They have ability to transform normal cell into a tumour and cancerous cells
2. They are easily available
3. They infect all plant and animal cells
4. They are pathogen

149. Ploidy level of Embryosac, Megaspore mother cell and nucellus is respectively:

1. n, n, n
2. n, n, 2n
3. n, 2n, 2n
4. 2n, 2n, 2n

150. Wall of anther is composed of four layers in which:

1. Endothecium is inner most
2. Tapetum is inside the endothecium
3. Middle layer separates inner most tapetum from outer endothecium
4. Middle layer separates inner most endothecium from outer layer tapetum

151. The signals for parturition originate from:

1. fully developed foetus only
2. placenta only
3. placenta as well as fully developed foetus
4. oxytocin released from maternal pituitary gland.

152. Under certain condition, scientists have obtained cell like structure (without cellular organisation) called:

1. Eobiont
2. Coacervates
3. Protists
4. Microbes

153. Match the following:

<table>
<thead>
<tr>
<th>Column-I</th>
<th>Column-II</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) Preformation theory</td>
<td>(i) K.F.Wolf</td>
</tr>
<tr>
<td>(b) Theory of epigenesis</td>
<td>(ii) C.Darwin</td>
</tr>
<tr>
<td>(c) Pangenesis theory</td>
<td>(iii) Swammerdam</td>
</tr>
<tr>
<td>(d) Germplasm theory</td>
<td>(iv) Weismann</td>
</tr>
</tbody>
</table>

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

148. अनु तू चिन अभावे व एकै में टूचू अधिकृत, तो इस कारण उस पर्याप्त तापमय तंत्र नहीं। जब उसे में जिस की बल ने चिन जाता है, तो उसे चिन कर सकते हैं।

149. प्लॉड के घ, गुरुंयो उष्ण, मात्र को चिन तथा बी के गुरुंयो टोड़ते हैं: हैं:-

(1) n, n, n
(2) n, n, 2n
(3) n, 2n, 2n
(4) 2n, 2n, 2n

150. सभी कारणों के चिन्द्र तथा चिन्द्र कार्य जिनाने हैं:

(1) एंड्वर्ड के था सिंह वर्ण अ- तरिक़े हैं
(2) इंडेसबल में एंड्वर्ड के सिंह के अधिकृत हैं तो हैं
(3) अ- तरिक़े पूर्व टोर्न में वां बाह्यत में एंड्वर्ड के सिंह के बीच मध्यरूप हैं तो हैं
(4) अ- तरिक़े पूर्व में एंड्वर्ड के सिंह वां हार्ट में वां मध्यरूप हैं तो हैं

151. और कारणों के संगत का रुपा होता हैं:

(1) विचलु भूमि चिन्द्र गृह घर द्वारा
(2) अशार्क द्वारा
(3) अशार्क तथा पूर्व चिन्द्र गृह घर द्वारा
(4) मात्र पूर्व भूमि चिन्द्र से अन्वेषण से सेट तथा सिंह के रूप के निर्धारण तत्पर पूर्व दिया जाता है।

152. तत्पर पूर्व दिया जाता है:

(1) इंडेसबल में टोर्न तथा वां चिन्द्र द्वारा
(2) चिन्द्र द्वारा तथा वां चिन्द्र द्वारा
(3) प्रोटिपल तथा
(4) चिन्द्र द्वारा

153. प्रणय का मिलन किया गया:

<table>
<thead>
<tr>
<th>के संख्या</th>
<th>के संख्या</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) पूर्व न- निर्मिति तंत्र न- तंत्र (ii) K.F.Wolf</td>
<td></td>
</tr>
<tr>
<td>(b) अनु जान दिखाई त- तंत्र (ii) C.Darwin</td>
<td></td>
</tr>
<tr>
<td>(c) चिन्द्र जान द दिखाई त- तंत्र (iii) Swammerdam</td>
<td></td>
</tr>
<tr>
<td>(d) जान द- दिखाई त- (iv) Weismann</td>
<td></td>
</tr>
</tbody>
</table>

(a) a–iii, b–i, c–ii, d–iv
(b) a–iii, b–i, c–iv, d–ii
(c) a–i, b–iii, c–ii, d–iv
(d) a–i, b–ii, c–iii, d–iv
154. In a plant self incompatibility is controlled by three alleles $S_1$, $S_2$ and $S_3$. A male plant with genotype $S_1S_2$ is crossed with another female plant with genotype $S_2S_3$. Which of the following type of progeny can not be obtained?

1. $S_2S_2$
2. $S_1S_3$
3. $S_1S_2$
4. $S_3S_1$

155. The figure given below is the diagrammatic representation of the E.coli vector pBR322. Which one of the given options correctly identifies its certain components?

1. Hind III, ECORI-Antibiotic Resistance gene
2. Amp$, tet$ - Selectable markers
3. Ori-Original restriction enzyme
4. Rop - Reduced osmotic pressure

156. The expression of genes, for the production of milk in only female is: -

1. Sex linked trait
2. Y-linked trait
3. Sex limited trait
4. Sex influenced trait
157. This segment of DNA has restriction sites I & II which create restriction fragments a, b and c. Which of the following gel produced by electrophoresis would represent the separation and correct position of these fragments?

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>b</td>
<td>c</td>
</tr>
</tbody>
</table>

158. What is not true for RNA interference?

(1) A method of cellular defense in eukaryotic organism
(2) Si-RNA is formed
(3) RISC complex is formed
(4) Single stranded RNA prevent translation of m-RNA

159. Cleistogamous flower in some Angiosperm prevents?

(1) Geitonogamy, but not xenogamy
(2) Geitonogamy, but not autogamy
(3) Autogamy, but not xenogamy
(4) Both autogamy and geitonogamy

160. Thickening of cellulose fibres in anther helps in:

(1) Protection
(2) Nutrition
(3) Reproduction
(4) Dehiscence
161. Which of the following statements about morula in human is correct?

1. It has more cytoplasm and more DNA than an uncleaved zygote
2. It has almost equal quantity of cytoplasm as an uncleaved zygote but much more DNA
3. It has far less cytoplasm as well as less DNA than an uncleaved zygote
4. It has more or less equal quantity of cytoplasm and DNA as in uncleaved zygote

162. Which of the following set represent convergent evolution?

1. Wings of sparrow and wings of bat
2. Hind limb of rat and human
3. Potato and sweet potato
4. Blood proteins of man and apes

163. Read the following statements with respect to back cross?

A. It is the cross of F₁ individual with either one of the two parents
B. Phenotypic & genotypic ratio is same
C. It includes both test cross and out cross
D. It was performed by Mendel in his breeding experiment

How many statements are correct?

1. One  
2. Two  
3. Three  
4. Four

164. The height of a plant is under control of polygenic inheritance. The plant having genotype 'aabb' has 20 cm height and height of plant having genotype AaBb is 50 cm, what will be height of a plant having AABB genotype?

1. 45 cm  
2. 60 cm  
3. 80 cm  
4. 15 cm
165. If a genetic disease is transferred from a phenotypically normal but carrier female to only some of the male progeny, the disease is:-

(1) Huntington chorea
(2) Cystic fibrosis
(3) Pseudo ricketes
(4) Colourblindness

166. The cross over frequency between the genes A & B, A & C and B & C is 6 %, 15 % and 21 % respectively. What is the possible sequence of genes on chromosome ?

(1) A-B-C
(2) B-A-C
(3) A-C-B
(4) Either B-A-C or C-A-B

167. HGP in closely associated with the rapid development of a new area in biology, called as:-

(1) Biotechnology
(2) Bioinformatics
(3) Bioscience
(4) Biogeography

168. Which of the following is used to deliver desirable gene into animal cell -

(1) Normal retrovirus
(2) Disarmed retrovirus
(3) Agrobacterium
(4) E. coli

169. What is the role of synergids of embryosac of Angiosperms ?

(1) Fuse with male gamete to form the endosperm
(2) Protection of antipodals
(3) To form a filliform apparatus for absorption of food
(4) All of the above

170. The megasporangium on maturation in Angiosperms give rise to :-

(1) Fruit
(2) Embryo
(3) Seed
(4) Pollengrain
171. Diaphragms are contraceptive devices used by the females. Choose the correct options from the statements given below :-

(a) They are introduced into the uterus
(b) They are placed to cover the cervical region
(c) They act as physical barrier for sperm entry
(d) They mainly function as spermicidal agents

The correct options are :-

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

172. First bird originated in which period –

(1) Triassic (2) Jurassic
(3) Cretaceous (4) Permian

173. Mendel used flower position and height of plant in a dihybrid cross, then he obtained 9 : 3 : 3 : 1 ratio, but genes for both of these character are located on same chromosome. Mendel obtained this ratio due to :-

(1) Independent assortment
(2) Linkage
(3) Crossing over
(4) Mutation

174. If a polygenic trait is controlled by two gene pairs than what will be the probability of individuals in \( F_2 \) generation showing exacts resemblance to \( F_1 \) progeny :-

\[
\begin{array}{ll}
(1) & \frac{6}{16} \\
(2) & \frac{4}{16} \\
(3) & \frac{2}{16} \\
(4) & \frac{1}{16}
\end{array}
\]
175. Read the following statements for polygenic inheritance:

(a) It controls quantitative traits
(b) Parental population remains constant irrespective of polygenes number
(c) A single dominant allele express only a unit of the trait
(d) One of the parental phenotype is expressed in \( F_1 \) individuals

How many statements are correct?

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

176. In a dihybrid test cross 200 recombinant phenotypes were observed among 2500 progeny. The distance between the two genes is:

(1) 2 cM (centi Morgan)  (2) 2.4 cM (centi Morgan)  (3) 8 cM (centi Morgan)  (4) 10 cM (centi Morgan)

177. Given below is a DNA segment showing components of lac operon:

\[
\begin{align*}
P & \quad i \quad P & \quad O & \quad z & \quad y & \quad a \\
\end{align*}
\]

In this lac operon:

(1) Only z, y, a genes are transcribed
(2) RNA polymerase binds to operator site
(3) Glucose inhibits the expression of structural genes
(4) Binding of RNA polymerase to promotes is inhibited by alolactose

178. Which variety of bhindi is resistant to shoot borer and fruit borer insect?

(1) Pusa sawani  (2) Pusa A-4  (3) Pusa Komal  (4) Both (1) and (2)
179. If any cell of nucellus behave like a megaspore mother cell and to form a diploid embryosac is called:-
   (1) Adventive embryony
   (2) Apospory
   (3) Vegetative reproduction
   (4) Diplospory

180. Proteinaceous part of Maize endosperm is –
   (1) Apophysis
   (2) Aleurone layer
   (3) Peripheral layer
   (4) Scutellum

Your moral duty is to prove that ALLEN is ALLEN

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