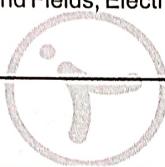


Test No. 5

TOPICS OF THE TEST

Physics

Electric Charges and Fields, Electrostatic Potential and Capacitance, Current Electricity



Chemistry

Hydrocarbons, Haloalkanes and Haloarenes, Alcohols, Phenols and Ethers, Aldehydes, Ketones and Carboxylic Acids

Botany

Sexual Reproduction in Flowering Plants, Principles of Inheritance and Variation

Zoology

Human Reproduction, Reproductive Health



MM : 720

TEST - 5

Time : 3 Hrs.

[PHYSICS]

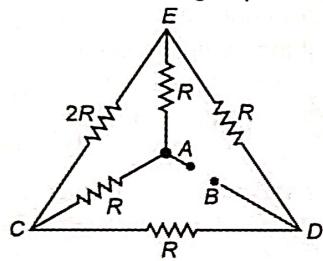
Choose the correct answer :

1. A potential difference V is applied to a metallic wire of diameter d and length l . If diameter of the wire is doubled, keeping length same, then change in electron drift speed v_d is

(1) v_d (2) $\frac{v_d}{2}$

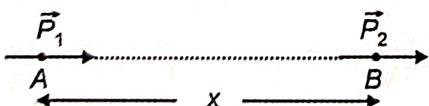
(3) $2v_d$ (4) No change

2. Five resistances are connected as shown in the figure. A battery of V volts is connected between A and B . The current flowing in part CE will be



(1) $\frac{V}{2R}$ (2) $\frac{V}{R}$
 (3) $\frac{V}{4R}$ (4) Zero

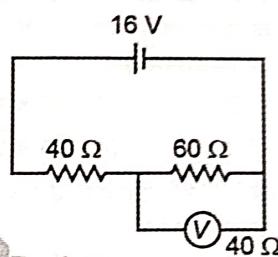
3. Two small electric dipoles, one of dipole moment \vec{P}_1 at point A and other of dipole moment \vec{P}_2 at point B , are as shown in the figure. The torque experienced by the dipole \vec{P}_2 is



(1) Zero (2) $\frac{2KP_1P_2}{x^2}$

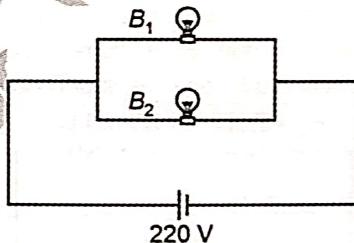
(3) $\frac{KP_1P_2}{x^3}$ (4) $\frac{2KP_1P_2}{x^3}$

4. The reading of voltmeter as shown in the figure is



(1) 16 V (2) 10 V
 (3) 6 V (4) 8 V

5. Two bulbs B_1 (100 W, 220 V) and B_2 (60 W, 220 V) are connected as shown in figure. Then

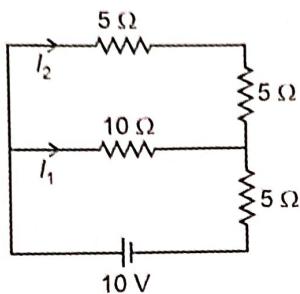


(1) B_1 glows brighter than B_2
 (2) B_2 glows brighter than B_1
 (3) Both glows equally bright
 (4) Bulb B_2 glows but bulb B_1 fuses

Space for Rough Work



6. Current I_1 in the network shown in figure is



- (1) 0.5 A (2) 1 A
 (3) 0.3 A (4) 0.6 A

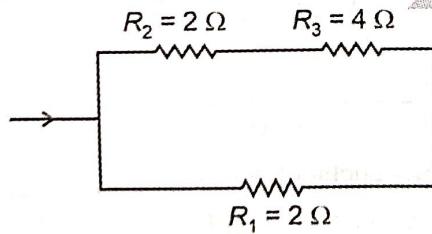
7. A wire has a resistance of $1\ \Omega$ at 30°C and $2\ \Omega$ at 100°C . The temperature coefficient of resistance of the wire is approximately

- (1) $55 \times 10^{-3}\ \text{ }^\circ\text{C}^{-1}$ (2) $45 \times 10^{-3}\ \text{ }^\circ\text{C}^{-1}$
 (3) $75 \times 10^{-3}\ \text{ }^\circ\text{C}^{-1}$ (4) $25 \times 10^{-3}\ \text{ }^\circ\text{C}^{-1}$

8. A charge particle having mass $0.4\ \text{kg}$ and charge $1\ \text{C}$ is projected with speed $10\ \text{m s}^{-1}$ from origin along x -direction, in a uniform electric field $E = 1\ \text{V m}^{-1}$ along y -direction. The speed of particle after $4\ \text{s}$ will be

- (1) $10\ \text{m s}^{-1}$ (2) $10\sqrt{2}\ \text{m s}^{-1}$
 (3) $5\sqrt{2}\ \text{m s}^{-1}$ (4) $20\sqrt{2}\ \text{m s}^{-1}$

9. In a circuit shown in figure, heat produced in resistor R_1 in one second due to a current flowing in it is $72\ \text{J}$. The heat produced in resistor R_3 in one second is



- (1) $24\ \text{J}$ (2) $16\ \text{J}$
 (3) $36\ \text{J}$ (4) $72\ \text{J}$

10. Given below are two statements: one is labelled as Assertion (A) and the other is labelled as Reason (R).

Assertion (A) : Resistivity of a conductor increases with increase in temperature.

Reason (R) : Metals have positive temperature coefficient of resistance.

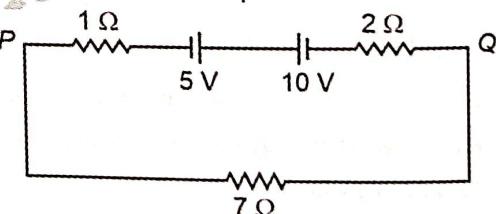
In the light of the above statements, the correct option is

- (1) Both (A) and (R) are true and (R) is the correct explanation of (A)
 (2) Both (A) and (R) are true but (R) is not the correct explanation of (A)
 (3) (A) is true but (R) is false
 (4) (A) is false but (R) is true

11. Two wires of same dimensions but resistivities ρ_1 and ρ_2 are connected in parallel. The equivalent resistivity of the combination is

- (1) $\frac{\rho_1 + \rho_2}{2}$ (2) $\frac{\rho_1 \rho_2}{(\rho_1 + \rho_2)^2}$
 (3) $\frac{2\rho_1 \rho_2}{\rho_1 + \rho_2}$ (4) $\rho_1^2 + \rho_2^2$

12. Two batteries of emf $5\ \text{V}$ and $10\ \text{V}$ having internal resistance of $1\ \Omega$ and $2\ \Omega$ respectively are connected across $7\ \Omega$ resistance as shown in figure. The potential difference between the points P and Q is



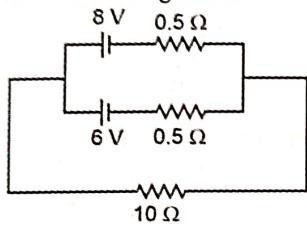
- (1) $5\ \text{V}$ (2) $4.5\ \text{V}$
 (3) $3.5\ \text{V}$ (4) $15\ \text{V}$

Space for Rough Work

https://t.me/AAKASH_TEST_SERIES_0105

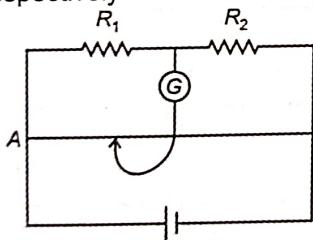


13. There is current of 100 A in a wire of 1 mm^2 area of cross-section. If the number density of free electrons is 10^{20} m^{-3} , then the drift velocity will be
 (1) $6.25 \times 10^{-3} \text{ m/s}$ (2) $6.25 \times 10^{-4} \text{ m/s}$
 (3) $2.25 \times 10^{-4} \text{ m/s}$ (4) $1.65 \times 10^{-3} \text{ m/s}$
14. An electric bulb marked 100 W and 220 V, is used in a circuit of supply voltage 110 V. Its new power becomes
 (1) Twice of initial power
 (2) Half of initial power
 (3) One fourth of initial power
 (4) One third of initial power
15. Potential difference across the 10Ω resistance in the network shown in figure is



- (1) 4.2 V (2) 5.4 V
 (3) 6.8 V (4) 8.6 V

16. In the figure shown, for given values of R_1 and R_2 , the balance point is at 30 cm from A. When R_2 is shunted by a resistance of 10Ω , balance point shifts to 40 cm from A. If AB = 100 cm, then values R_1 and R_2 are respectively

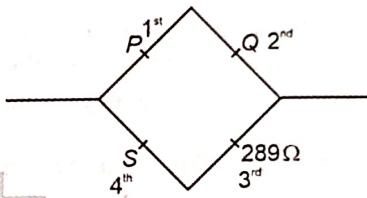


- (1) $\frac{50}{21} \Omega, \frac{50}{9} \Omega$ (2) $\frac{50}{21} \Omega, \frac{25}{9} \Omega$
 (3) $\frac{25}{21} \Omega, \frac{50}{9} \Omega$ (4) $\frac{25}{21} \Omega, \frac{25}{9} \Omega$

17. Ten identical cells each of emf 2 V and internal resistance 0.2Ω are connected in series. If polarity of 2 cells is reversed, then calculate equivalent emf of the battery. Also find the current flown in the circuit, if this battery is connected to an external resistance of 4Ω .

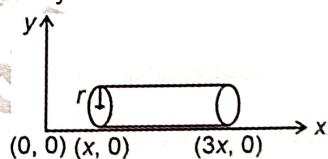
- (1) 20 V, 3.33 A (2) 12 V, 3.33 A
 (3) 8 V, 2 A (4) 12 V, 2 A

18. Wheatstone bridge is balanced with a resistance of 289Ω in the third arm, where resistances P, Q and S are connected in the first, second and fourth arm respectively. If P and Q are interchanged, the resistance in third arm has to be increased by 35Ω to secure balance again. The unknown resistance in the fourth arm is



- (1) 360Ω (2) 306Ω
 (3) 266Ω (4) 206Ω

19. A cylinder of radius r is placed in an electric field $\vec{E} = x\hat{i}$ as shown in the figure. The net electric flux through the cylinder.



- (1) $x\pi r^2$ (2) Zero
 (3) $2x\pi r^2$ (4) $3x\pi r^2$

20. A Gaussian spherical surface encloses an electric dipole having charge $2 \mu\text{C}$. What is the total electric flux through the surface?
 (1) Zero (2) $2.25 \times 10^5 \text{ N m}^2/\text{C}$
 (3) $12.25 \times 10^6 \text{ N m}^2/\text{C}$ (4) $4.5 \times 10^5 \text{ N m}^2/\text{C}$

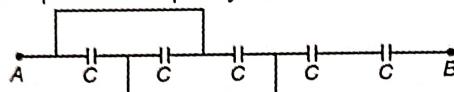
Space for Rough Work



21. A parallel plate capacitor has a capacitance of $110 \mu\text{F}$ when immersed in oil. If dielectric constant of the oil is 5.5, then its capacitance in air is

(1) $550 \mu\text{F}$ (2) $20 \mu\text{F}$
 (3) $200 \mu\text{F}$ (4) $55 \mu\text{F}$

22. Five capacitors are connected as shown in figure. The equivalent capacity between A and B is



(1) $5C$ (2) $\frac{C}{5}$
 (3) $\frac{3C}{7}$ (4) $\frac{8C}{3}$

23. An electric dipole is placed in the direction of uniform external electric field. Then dipole is having

(1) Minimum potential energy and unstable equilibrium state.
 (2) Minimum potential energy and stable equilibrium state.
 (3) Maximum potential energy and stable equilibrium state.
 (4) Maximum potential energy and neutral equilibrium state.

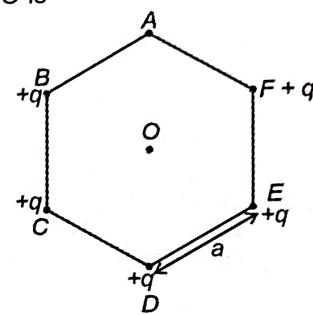
24. For a closed surface, if $\oint \vec{E} \cdot d\vec{A} = 0$, then it implies that

(A) Net charge present inside the closed surface is zero
 (B) Net charge present outside the surface is zero
 (C) There may be charges present out the surface
 (1) Only (B) is correct
 (2) Only (A) and (C) are correct
 (3) Only (A) is correct
 (4) All (A), (B) and (C) are correct

25. A point charge 3 nC is placed at the origin. The intensity of electric field due to this charge at a point $(\sqrt{2}, 1, 0) \text{ m}$ is

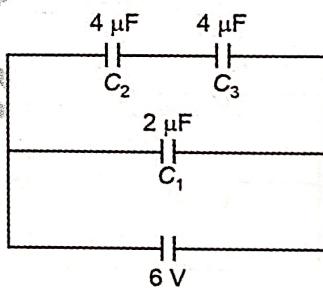
- (1) $(\sqrt{6}\hat{i} + \sqrt{3}\hat{j}) \text{ N/C}$ (2) $(6\hat{i} + 3\hat{j}) \text{ N/C}$
 (3) $(3\sqrt{6}\hat{i} + 3\sqrt{3}\hat{j}) \text{ N/C}$ (4) $(6\sqrt{6}\hat{i} - 3\sqrt{3}\hat{j}) \text{ N/C}$

26. Five point charges each of value $+q$ are placed at the vertices of a regular hexagon of side a unit as shown in the figure. Net electric field at centre of hexagon O is



(1) $\frac{5kq}{a^2}$ along OA (2) $\frac{kq}{a^2}$ along OD
 (3) $\frac{kq}{a^2}$ along OA (4) $\frac{5kq}{a^2}$ along OD

27. Three capacitors are connected to a battery of 6 V as shown in figure. If the charge on capacitors C_1 and C_2 are q_1 and q_2 , then the ratio of charges $\frac{q_1}{q_2}$ is

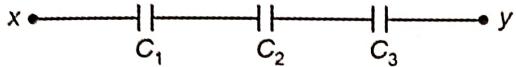


(1) $\frac{1}{2}$ (2) $\frac{1}{4}$
 (3) $\frac{1}{3}$ (4) 1

Space for Rough Work



28. In the circuit shown below $C_1 = 30 \mu\text{F}$, $C_2 = 40 \mu\text{F}$ and $C_3 = 50 \mu\text{F}$. If no capacitor can sustain more than 50 V, then maximum potential difference that can be safely applied between points x and y, will be



- (1) 50 V (2) 150 V
 (3) 16.67 V (4) 117.5 V

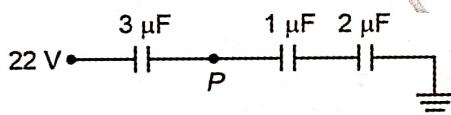
29. Two point charges $5 \mu\text{C}$ and $-3 \mu\text{C}$ are placed 16 cm apart. At what point(s), on the line joining the two charges, is the electric potential zero? Take the potential at infinity to be zero.

- (1) 10 cm from $5 \mu\text{C}$ (2) 24 cm from $-3 \mu\text{C}$
 (3) 8 cm from $5 \mu\text{C}$ (4) Both (1) and (2)

30. Electrostatic potential energy of a system consisting of two charges $5 \mu\text{C}$ and $-2 \mu\text{C}$ placed at $(-10 \text{ cm}, 0, 0)$ and $(10 \text{ cm}, 0, 0)$ respectively is

- (1) 45 J (2) -450 J
 (3) -0.45 J (4) 4.5 J

31. In the given circuit, the electric potential at point P will be



- (1) 11 V (2) 18 V
 (3) 22 V (4) $\frac{22}{3} \text{ V}$

32. A capacitor of $10 \mu\text{F}$ charged to 200 V is connected in parallel with another capacitor of $20 \mu\text{F}$ charged to 100 V in same sense. The common potential will be

- (1) $\frac{200}{3} \text{ V}$ (2) $\frac{400}{3} \text{ V}$
 (3) 300 V (4) 200 V

33. An electric field $\vec{E} = 10x\hat{i}$ exists in the space. Taking the potential at $(5 \text{ m}, 5 \text{ m}, 5 \text{ m})$ to be zero, potential at the origin will be

- (1) 50 V (2) 150 V
 (3) 125 V (4) 75 V

34. Consider the following statements and choose the correct option among the following.

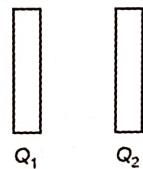
Statement A: Inside the bulk material of a conductor, electrostatic field is zero.

Statement B: Electrostatic potential is zero throughout the volume of the charged conductor and has the different values on its surface.

Statement C: At the surface of a charged conductor, electrostatic field must be normal to the surface at every point.

- (1) Only statement A is correct
 (2) Only statements B and C are correct
 (3) Only statements A and C are correct
 (4) All statements A, B and C are correct

35. Consider a parallel plate capacitor whose two plates are having charges Q_1 and Q_2 as shown in figure. Charge which is responsible for electric field in between the plates of the capacitor, is

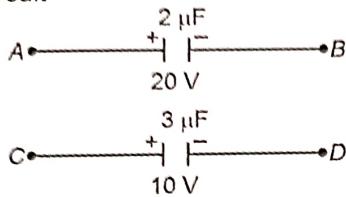


- (1) $\frac{Q_1 + Q_2}{2}$ (2) $Q_1 + Q_2$
 (3) $Q_1 - Q_2$ (4) $\frac{Q_1 - Q_2}{2}$

Space for Rough Work

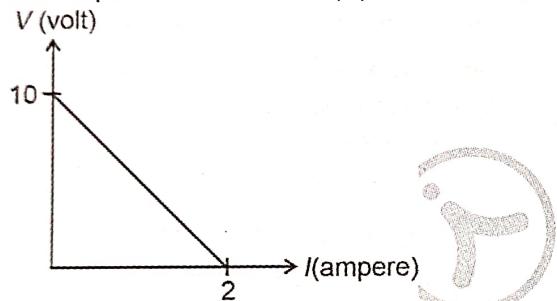


36. If plate A of a $2 \mu\text{F}$ capacitor is connected with plate C of a $3 \mu\text{F}$ capacitor and plate B is connected with plate D as shown in the figure, then heat produced in the circuit



- (1) $100 \mu\text{J}$ (2) $60 \mu\text{J}$
 (3) $40 \mu\text{J}$ (4) $80 \mu\text{J}$

37. A battery of emf E and internal resistance r is connected across a variable load resistance R . A graph is plotted between the current in the circuit (I) and terminal potential difference (V) of the battery.

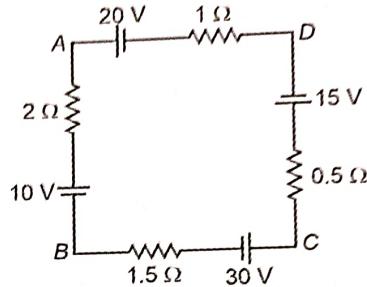


Based on the above information, match the entries in column I and column II (in SI units).

Column I		Column II
A. Emf of the battery	(P)	Zero
B. Maximum current obtained from the battery	(Q)	10
C. Internal resistance of the battery	(R)	2
D. Value of load resistance when maximum current is drawn from the battery	(S)	5

- (1) A(Q), B(R), C(S), D(P)
 (2) A(Q), B(P), C(S), D(R)
 (3) A(Q), B(R), C(P), D(S)
 (4) A(P), B(Q), C(R), D(S)

38. In the given circuit, potential difference between points A and B, is



- (1) 20 V (2) 10 V
 (3) 14 V (4) 15 V

39. Current is flowing through a cylindrical conductor of non-uniform cross-sectional area. If $A_1 > A_2$, I is current, J is current density and v is drift velocity then



- (1) $J_1 < J_2$ (2) $I_1 = I_2$
 (3) $v_1 < v_2$ (4) All of these

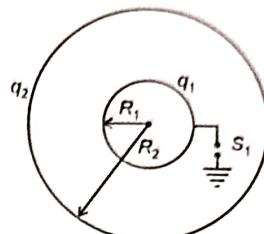
40. A conducting pipe of cross-sectional area A contains two types of particles P and Q carrying charges $-e$ and $+2e$. A potential difference is applied between the ends of the pipe resulting in the drifting of P and Q with drift speeds v and $\frac{v}{3}$ respectively. The current flowing through the pipe is (Assume P and Q have same number charge density = n)

- (1) $\frac{3}{2} neAv$ (2) $\frac{5}{3} neAv$
 (3) $\frac{2}{3} neAv$ (4) $\frac{4}{3} neAv$

Space for Rough Work



41. Two identical cells each of emf 2 V and internal resistance r are joined in parallel. This combination provides supply to an external circuit consisting of two resistors of resistance 15Ω each joined in parallel. If potential difference across one of the cells is 1.8 V, then value of r will be
 (1) 1.33Ω (2) 1.21Ω
 (3) 1.67Ω (4) 1.76Ω
42. If charge Q on capacitor is increased by an amount x such that the energy stored in it increases by 69%, then value of x is
 (1) $0.69 Q$ (2) $1.3 Q$
 (3) $0.3 Q$ (4) $1.69 Q$
43. An object of mass 1 kg is having a charge of 2×10^{-2} C. The potential difference with which it must be accelerated, starting from rest, to acquire a speed of 5 m s^{-1} is
 (1) 125 V (2) 250 V
 (3) 625 V (4) 450 V
44. If 10^{12} electrons move out of a body to another body every second. How much time is required to get a total charge of 0.2 C on the body?
 (1) $2.5 \times 10^6 \text{ s}$ (2) $1.25 \times 10^6 \text{ s}$
 (3) $6.25 \times 10^5 \text{ s}$ (4) $2.5 \times 10^5 \text{ s}$
45. Consider two concentric spherical conducting shells as shown in the figure. When switch S_1 is closed, then in steady state



Statement A: Charge on outer surface of earthed shell is non-zero.

Statement B: Potential of inner conducting shell is zero.

Statement C: Charge on inner conducting shell is $q' = \frac{-q_2 R_1}{R_2}$

Select the correct option.

- (1) Only statement A is correct
- (2) Only statement B and C are correct
- (3) Only statement A and C are correct
- (4) All statements A, B and C are correct

[CHEMISTRY]

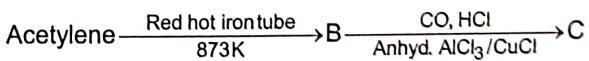
46. Match the List-I with List-II.

List-I (Reaction)		List-II (Major product)
a. $\xrightarrow{(i) \text{KMnO}_4/\text{H}_2\text{SO}_4, \Delta}$	(i)	
b. $\xrightarrow{\Delta}$	(ii)	
c. $\xrightarrow{(i) \text{CH}_3\text{MgBr/ether}}$ $\xrightarrow{(ii) \text{H}_2\text{O}}$	(iii)	
d. $\xrightarrow{(i) \text{CH}_3\text{OH}}$ $\xrightarrow{\text{CH}_3\text{OH (1 eq.)}/\text{HCl(g)}}$ $\xrightarrow{(ii) \text{NaBH}_4}$ $\xrightarrow{(iii) \text{H}_2\text{O}^+}$	(iv)	

Choose the correct match.

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

47. In the given reaction sequence the final major product (C) is



- (1) Benzoic acid
- (2) Benzophenone
- (3) Benzaldehyde
- (4) Acetophenone

Space for Rough Work



48. Consider the following statements

- Dipole moment of fluoromethane is less than chloromethane.
- Melting point of 1, 2-Dichlorobenzene is less than 1, 3-Dichlorobenzene.
- Alkyl iodides can be prepared by Swarts reaction.

Choose the incorrect statements.

- (a) and (b) only
- (b) and (c) only
- (a) and (c) only
- (a), (b) and (c)

49. Given below are two statements.

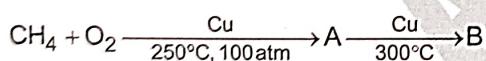
Statement I : Acetone and benzaldehyde on heating with Fehling's solution oxidises to corresponding carboxylate ion.

Statement II : Acetone and benzaldehyde both give carboxylate ion on heating with freshly prepared ammoniacal silver nitrate solution.

In the light of above statements choose the correct option.

- Both statement I and statement II are incorrect
- Both statement I and statement II are correct
- Statement I is correct but statement II is incorrect
- Statement I is incorrect but statement II is correct

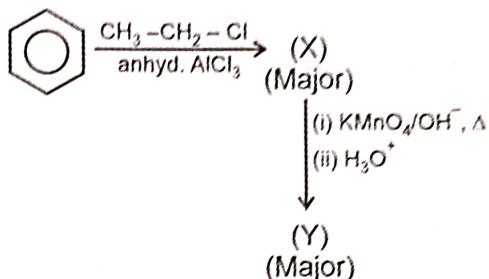
50. Consider the following reaction sequence.



The major products A and B respectively are

- $\text{A} \rightarrow \text{HCHO}$, $\text{B} \rightarrow \text{CH}_3\text{OH}$
- $\text{A} \rightarrow \text{CH}_3\text{OH}$, $\text{B} \rightarrow \text{HCHO}$
- $\text{A} \rightarrow \text{CH}_3\text{OH}$, $\text{B} \rightarrow \text{CO}_2$
- $\text{A} \rightarrow \text{HCHO}$, $\text{B} \rightarrow \text{CO}_2$

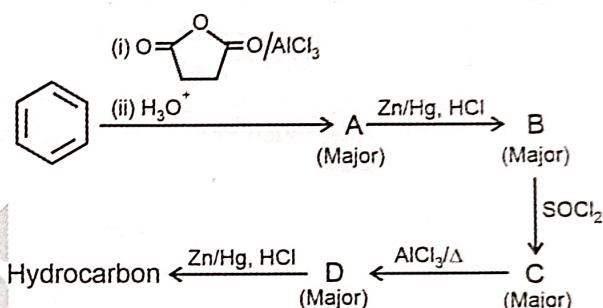
51. Consider the following reaction.



The major product Y is

- Ethyl benzene
- Benzaldehyde
- Benzoic acid
- Benzene

52. Consider following statements regarding the reaction sequence given below.



- Compounds A and B liberate CO_2 gas on reaction NaHCO_3 ..
- Compound D react with hydroxylamine to give the corresponding oximes
- Compound C reacts with dialkylcadmium to give the corresponding tertiary alcohol.

Choose the correct statements.

- (a) and (b) only
- (b) and (c) only
- (a) and (c) only
- (a), (b) and (c)

Space for Rough Work



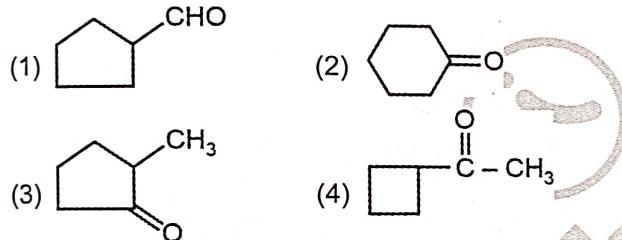
53. A mixture of benzaldehyde and formaldehyde on heating with conc. NaOH solution majorly gives

- Sodium benzoate and methyl alcohol
- Benzyl alcohol and sodium formate
- Sodium benzoate and sodium formate
- Benzyl alcohol and methyl alcohol

54. Urotropine is obtained when

- Urea reacts with formaldehyde
- Urea reacts with ammonia
- Formaldehyde reacts with ammonia
- Acetone reacts with ammonia

55. Compound 'A' having molecular formula $C_6H_{10}O$ gives positive test with 2, 4-DNP. It gives negative test with Tollen's reagent and Fehling solution. Yellow precipitate is obtained when it is treated with $I_2/NaOH$. The structure of compound 'A' will be



56. Given below are two statements.

Statement I: Methanol is produced by catalytic hydrogenation of carbon monoxide at high temperature and pressure and in the presence of $ZnO - Cr_2O_3$ catalyst.

Statement II: The hydrogensulphite addition compound of carbonyl group are water soluble.

In the light of above statements choose the correct option.

- Both statement I and statement II are correct
- Both statement I and statement II are incorrect

- Statement I is correct but statement II is incorrect
- Statement I is incorrect but statement II is correct

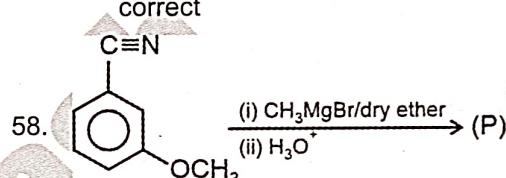
57. Given below are two statements

Statement I: Synthesis of ethyl phenyl ether can be achieved by Williamson synthesis.

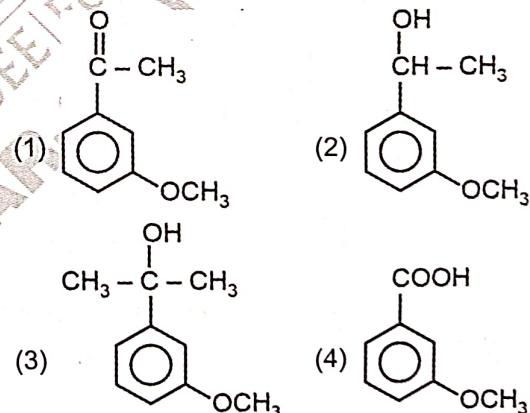
Statement II: Reaction of bromobenzene with sodium ethoxide yields ethyl phenyl ether.

In the light of above statements choose the correct option.

- Both statement I and statement II are correct
- Both statement I and statement II are incorrect
- Statement I is correct but statement II is incorrect
- Statement I is incorrect but statement II is correct



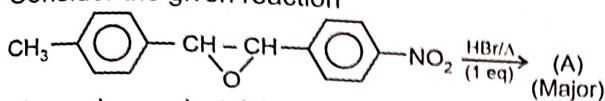
The major product P in the above reaction is



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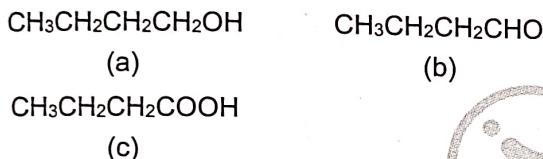
64. Consider the given reaction



The major product A is

- (1) $\text{CH}_3\text{---}\text{C}_6\text{H}_4\text{---CH}(\text{OH})\text{---CH}(\text{Br})\text{---C}_6\text{H}_4\text{---NO}_2$
- (2) $\text{C}_6\text{H}_4\text{---CH}(\text{Br})\text{---CH}(\text{OH})\text{---C}_6\text{H}_4\text{---NO}_2$
- (3) $\text{CH}_3\text{---}\text{C}_6\text{H}_4\text{---CH}(\text{Br})\text{---CH}(\text{OH})\text{---C}_6\text{H}_4\text{---NO}_2$
- (4) $\text{C}_6\text{H}_4\text{---CH}(\text{Br})\text{---CH}(\text{OH})\text{---C}_6\text{H}_4\text{---NO}_2$

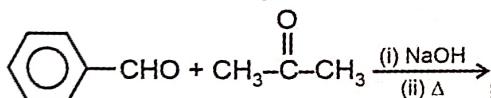
65. Consider the following compounds



The correct order of boiling point is

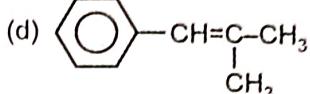
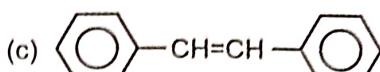
- (1) (a) > (b) > (c)
- (2) (c) > (a) > (b)
- (3) (a) > (c) > (b)
- (4) (c) > (b) > (a)

66. Consider the following reaction



Identify the products that can be formed in given reaction.

- (a) $\text{CH}_3\text{---C}(=\text{O})\text{---CH}=\text{C}(\text{CH}_3)\text{---CH}_3$
- (b) $\text{C}_6\text{H}_5\text{---CH}=\text{CH---C}(=\text{O})\text{---CH}_3$



Choose the correct option.

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

67. On heating glycerol with KHSO_4 , compound A is obtained which has bad odour. The compound A is

- (1) Formic acid
- (2) Acrolein
- (3) Allene
- (4) Allyl alcohol

68. Given below are two statements.

Statement I : The acidic strength of o-Cresol is less than phenol because of electron donating nature of methyl group.

Statement II : o-Cresol, m-Cresol and p-Cresol will have same acidic strength as they have one methyl group attached to the phenolic compound.

In the light of above statements choose the most appropriate answer from the options given below.

- (1) Both statement I and statement II are correct
- (2) Both statement I and statement II are incorrect
- (3) Statement I is correct but statement II is incorrect
- (4) Statement I is incorrect but statement II is correct

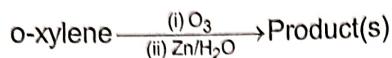
69. The major organic compound formed by heating of 1, 1, 1-Trichloromethane with silver powder is

- (1) 1, 2-Dichloroethane
- (2) Ethene
- (3) Ethyne
- (4) Ethane

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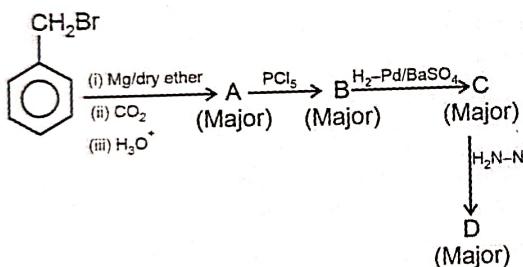


70. Identify the correct set of products for the following reaction.



- (1) $\begin{matrix} \text{CHO} \\ | \\ \text{CH}_3 - \text{C} = \text{O} \\ \text{CHO} \end{matrix}$ and $\text{CH}_3 - \text{C}(=\text{O}) - \text{C}(=\text{O}) - \text{CH}_3$ only
- (2) CH_2O and $\text{CH}_3 - \text{C}(=\text{O}) - \text{CH}_3$ only
- (3) $\text{CH}_3 - \text{C}(=\text{O}) - \text{C}(=\text{O}) - \text{CH}_3$ and $\text{CH}_3 - \text{C}(=\text{O}) - \text{CHO}$ only
- (4) $\text{CH}_3 - \text{C}(=\text{O}) - \text{CHO}$, $\begin{matrix} \text{CHO} \\ | \\ \text{CH}_3 - \text{C} = \text{O} \\ \text{CHO} \end{matrix}$ and $\text{CH}_3 - \text{C}(=\text{O}) - \text{C}(=\text{O}) - \text{CH}_3$

71. Consider the following reaction sequence.



The major product 'D' is

- (1) $\text{C}_6\text{H}_5\text{--CH}_2\text{--C}(=\text{O})\text{--NH--C}_6\text{H}_5$
- (2) $\text{C}_6\text{H}_5\text{--CH}=\text{N--NH--C}_6\text{H}_5$
- (3) $\text{C}_6\text{H}_5\text{--CH}_2\text{--CH}=\text{N--NH--C}_6\text{H}_5$
- (4) $\text{C}_6\text{H}_5\text{--CH}_2\text{--NH--NH--C}_6\text{H}_5$

72. Given below are two statements.

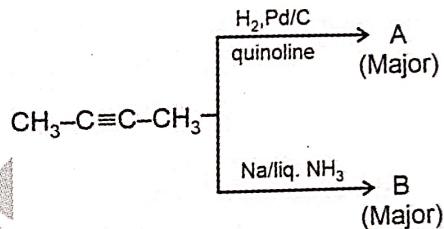
Statement I : Meso compounds are optically inactive and have plane of symmetry but contains chiral centres.

Statement II : Chloroform reacts with conc. HNO_3 to form chloropicrin.

In the light of above statements choose the correct option.

- (1) Both statement I and statement II are correct
 (2) Both statement I and statement II are incorrect
 (3) Statement I is correct but statement II is incorrect
 (4) Statement I is incorrect but statement II is correct

73. Consider the following set of reactions



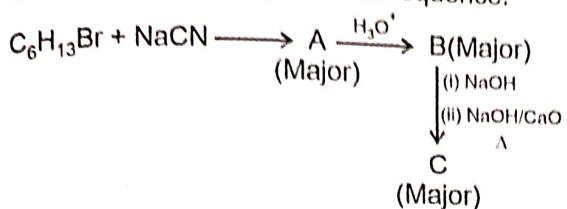
Identify the correct relation between products A and B.

- (1) Chain isomers
 (2) Functional group isomers
 (3) Geometrical Isomers
 (4) Position Isomers
74. 2-Bromopentane is heated with potassium tert-butoxide in ethanol. The major product will be
 (1) Trans-pent-2-ene
 (2) Cis-pent-2-ene
 (3) pent-1-ene
 (4) 2-ethoxypentane

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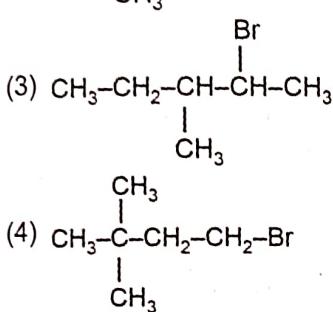


75. Consider the following reaction sequence.



'C' has the molecular formula C_6H_{14} , which gives five structural isomeric monochloro derivative on chlorination. The structure of $C_6H_{13}Br$ will be

- (1) $\text{CH}_3 - \text{CH}_2 - \text{CH}_2 - \text{CH}_2 - \text{CH}_2 - \text{CH}_2 - \text{Br}$
 (2) $\text{CH}_3 - \text{CH} - \text{CH}_2 - \text{CH}_2 - \text{CH}_2 - \text{Br}$



76. Given below are two statements.

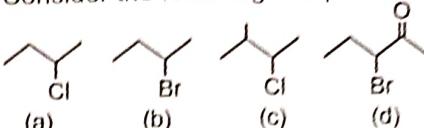
Statement I : Freon 12 (CCl_2F_2) is manufactured from tetrachloromethane by Swarts reaction.

Statement II : Chlorobenzene when heated with chloral in the presence of conc. H_2SO_4 form p, p'-Dichlorodiphenyltrichloroethane (DDT) as a major product.

In the light of above statements choose the correct option.

- (1) Both statement I and statement II are correct
 - (2) Both statement I and statement II are incorrect
 - (3) Statement I is correct but statement II is incorrect
 - (4) Statement I is incorrect but statement II is correct

77. Consider the following compounds.



- The correct decreasing order of rate of S_N2 reaction is

- (1) (b) > (a) > (d) > (c) (2) (d) > (b) > (a) > (c)
 (3) (a) > (b) > (c) > (d) (4) (d) > (b) > (c) > (a)

78. Given below are two statements.

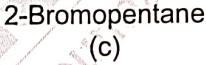
Statement I : When CH_3Br is treated with AgCN , the major product is CH_3CN .

Statement II : Chlorobenzene can be converted into phenol by heating in aqueous sodium hydroxide solution at a temperature of 623 K and a pressure of 300 atmospheres followed by acidification.

In the light of above statements, choose the most appropriate option from the option given below.

- (1) Both statement I and statement II are correct
 - (2) Both statement I and statement II are incorrect
 - (3) Statement I is correct but statement II is incorrect
 - (4) Statement I is incorrect but statement II is correct

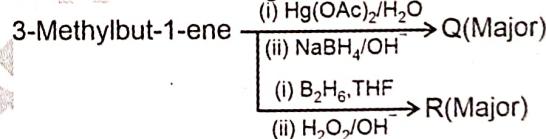
79. Consider the following compounds



The correct order of reactivity towards S_N1 reaction is

- (1) (b) > (c) > (a) (2) (a) > (b) > (c)
 (3) (c) > (b) > (a) (4) (b) > (a) > (c)

80. Consider the following reactions.



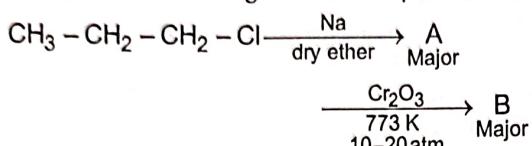
Identify the correct degree of alcohol formed as Q and R respectively.

- (1) Primary and Secondary
 - (2) Tertiary and Secondary
 - (3) Primary and Tertiary
 - (4) Secondary and Primary



81. The most stable conformation of n-butane by considering rotation around C₂ – C₃ carbon is
 (1) Gauche form
 (2) Fully eclipsed form
 (3) Anti form
 (4) Partially eclipsed form

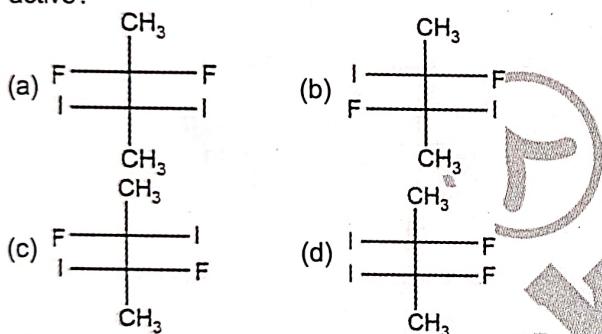
82. Consider the following reaction sequence.



The major product 'B' is

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

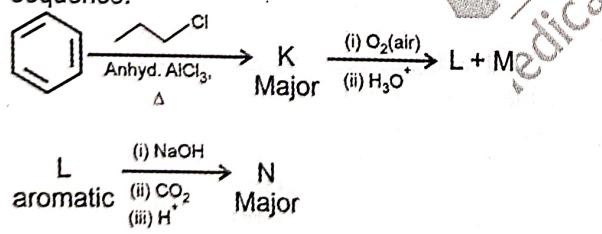
83. Which of the following compounds are optically active?



Choose the correct option.

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

84. Match List-I with List-II for the given reaction sequence.

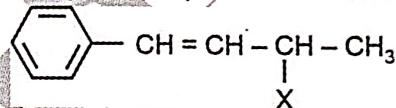


	List-I (Product)		List-II (Structure of Product)
a.	K	(i)	
b.	L	(ii)	
c.	M	(iii)	
d.	N	(iv)	CH ₃ COCH ₃

Choose the correct match.

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

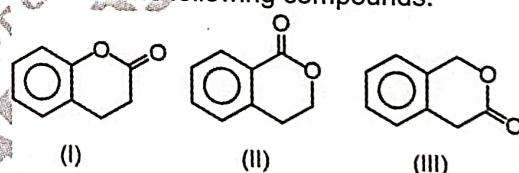
85. The given compound is an example of



Choose the correct option.

- (1) Allylic halide (2) Aryl halide
 (3) Vinyllic halide (4) Benzylic halide

86. Consider the following compounds.



The correct order of rate of electrophilic aromatic substitution reaction is

- (1) (I) > (II) > (III)
 (2) (I) > (III) > (II)
 (3) (II) > (III) > (I)
 (4) (III) > (I) > (II)

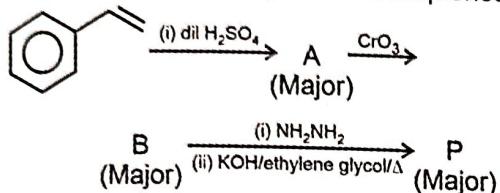
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Choose the correct option.

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

88. Consider the following reaction sequence.



The major product 'P' is

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

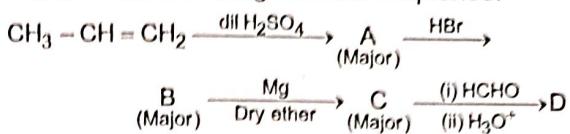
[BOTANY]

91. In an angiospermic pollen grain, vegetative cell differs from the generative cell as the former

 - Has small amount of food reserves and is devoid of nucleus
 - Is spindle shaped with thin peripheral cytoplasm
 - Has a large irregularly shaped nucleus
 - Is small and floats in the cytoplasm of latter

92. Observe the following recombination frequencies between the genes and choose the **correct** sequence of these genes on a linear chromosome.

89. Consider the following reaction sequence.



The major product 'D' is

- (1) $\text{CH}_3 - \underset{\text{CH}_2 - \text{OH}}{\underset{|}{\text{CH}}} - \text{CH}_3$

(2) $\text{CH}_3 - \text{CH}_2 - \text{CH}_2 - \text{CH}_2 - \text{OH}$

(3) $\text{CH}_3 - \text{CH}_2 - \underset{\text{OH}}{\underset{|}{\text{CH}}} - \text{CH}_3$

(4) $\begin{array}{c} \text{CH}_3 \\ | \\ \text{CH}_3 - \text{C} - \text{OH} \\ | \\ \text{CH} \end{array}$

90. Major product 'A' in given reaction is

$$\text{CH}_3\text{COOH} \xrightarrow{\begin{array}{l} (\text{i}) \text{Br}_2/\text{Red phosphorus} \\ (\text{ii}) \text{H}_2\text{O} \end{array}} \text{A}$$

(1) CH_3COBr (2) CH_2BrCOOH
 (3) CH_3CHO (4) CH_3Br

	Genes	Recombination frequency
•	P and S	24%
•	Q and P	39%
•	P and T	9%
•	T and S	15%

Choose the **correct option.**

- (1) P, S, Q, T
 - (2) P, T, Q, S
 - (3) P, T, S, Q
 - (4) S, P, T, Q



93. Which of the following statements is **correct**?
- The fruits may be fleshy as in guava and mustard but may be dry in orange, mango and groundnut.
 - Majority of flowering plants produce hermaphrodite flowers and pollen grains are likely to come in contact with stigma of the same flower.
 - Moth and *Yucca* plant complete their life cycles without each other
 - Endosperm in a monocot seed is usually surrounded by a diploid proteinaceous layer.
94. In some cereals such as rice and wheat, pollen grains lose viability within _____ of their release.
Choose the **correct** option to fill in the given blank.
- 3 months
 - 30 minutes
 - 3 years
 - 30 hours
95. When there is movement of a gene from one linkage group to another, it is called
- Recombination
 - Translocation
 - Transition
 - Inversion
96. When two true breeding plants with round yellow and wrinkled green seeds are crossed, then what phenotypic ratio will be obtained in F_2 generation after selfing of F_1 progeny?
- 1 : 1 : 1 : 1
 - 3 : 1
 - 9 : 3 : 3 : 1
 - 1 : 2 : 1
97. In some species of Asteraceae and grasses, a special mechanism for seed production without fertilisation is seen. This form of asexual reproduction is called as
- Parthenocarpy
 - Apomixis
 - Polyembryony
 - Parthenogenesis
98. The classic example of pleiotropy is
- Flower colour in *Mirabilis jalapa*
 - Phenylketonuria
 - ABO blood grouping
 - Human height
99. How many pairs of contrasting characters of pea plant were studied by Mendel for his experiment?
- Nine
 - Eight
 - Fourteen
 - Seven
100. All of the given statements are true regarding the law of dominance, **except**
- Factors occur in pairs
 - It is used to explain the expression of only one of the parental characters in a monohybrid cross in the F_1 and the expression of both in the F_2 generation.
 - This law is universally applicable
 - Characters are controlled by discrete units called factors.
101. Which of the following characteristics are seen in an individual, affected by a genetic disorder caused due to trisomy, resulting into a karyotype of 47, XYY?
- Broad palm with characteristic palm crease, and retardation of physical, psychomotor and mental development.
 - Overall masculine development but sterile.
 - Accumulation of phenylalanine in brain and its poor absorption by kidney.
 - Short statured with small round head and partially open mouth.

Space for Rough Work



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 - Short statured with small round head and partially open mouth.

Space for Rough Work



102. Read the given statements and state them as true (T) or false (F).

(A) Thalassemia differs from sickle-cell anaemia in that the former is a qualitative problem while the latter is a quantitative problem of synthesising an incorrectly functioning globin.

(B) Hb^AHb^S individuals appear apparently unaffected but they are the carriers of disease, as there is 50 percent probability of transmission of mutant gene to the progeny.

Choose the **correct** option.

(A)	(B)
(1) T	F
(2) T	T
(3) F	T
(4) F	F

103. Select the **odd** one out w.r.t. human skin colour.

- 
 - (1) It is a polygenic trait
 - (2) It follows the type of inheritance which also takes into account the influence of environment
 - (3) The alleles show co-dominance and are able to express themselves independently when present together.
 - (4) The effect of all the genes is additive and the amount of melanin produced is always proportional to the number of dominant genes

104. How many different types of gametes will be produced by a plant having the genotype $TtYYzzCcOO$?

- (1) Two
 - (2) Eight
 - (3) Four
 - (4) Sixteen

105. Select the **correctly** matched pair.

(1)	Polygenic traits	-	Follow Mendelian inheritance pattern
(2)	Pleiotropy	-	A single gene product may produce more than one effect
(3)	Polyploidy	-	It is often seen in animals
(4)	Polydactyly	-	Recessive trait, observed in human beings

106. In honey bees,

- (1) Drones are diploid, having 32 chromosomes
 - (2) Egg develops as a female by means of parthenogenesis
 - (3) Males produce sperms by meiosis
 - (4) Males have a grandfather and can have grandsons but cannot have father and sons

107. Sickle cell anaemia is an example of which of the given mutations?

- (1) Aneuploidy (2) Transversion
 (3) Frame-shift (4) Transition

108. Identify the **correct** option w.r.t. the result that can possibly be obtained, when a snapdragon flower with the genotype RR is crossed with a flower with the genotype Rr.

- (1) Pink coloured flowers are obtained due to codominance
 - (2) Phenotypic ratio of 1(red): 1(pink) is obtained
 - (3) All red coloured flowers are obtained in the progeny
 - (4) Genotypic ratio of 1(red): 2 (pink) is obtained

Space for Rough Work



109. Match List I with List II.

	List I		List II
a.	Pericarp	(i)	Special cellular thickenings at micropylar tip in helper cells for guiding pollen tube
b.	Hilum	(ii)	The wall of ovary that develops into the fruit wall
c.	Micropyle	(iii)	Represents the junction between ovule and funicle
d.	Filiform apparatus	(iv)	Allows the entry of oxygen and water into a seed during germination.

Choose the **correct** option.

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

110. What could be the possible genotype(s) of the parents, if their progeny have A, B and AB blood groups?

- (i) ii × I^BI^B (ii) I^AI^A × I^BI^B
 (iii) I^AI^B × I^Ai (iv) I^Bi × I^AI^A

The **correct** one(s) is/are

- (1) (i) and (iv) only (2) (ii), (iii) and (iv) only
 (3) (iii) only (4) (iii) and (iv) only

111. Which among the following are the reasons for choosing *Drosophila* as experimental material in genetics?

- (1) It has 8 pairs of morphologically distinct chromosomes
 (2) Females are easily distinguishable from males by larger body size and presence of ovipositor.
 (3) It does not exhibit hereditary variations at any level
 (4) It has a short life cycle of about 4 days

112. How many of the following traits of *Pisum sativum* can be observed only in homozygous condition?

- (a) Constricted pod shape
 (b) Axial flower position
 (c) White flower colour
 (d) Green seed colour
 (e) Green pod colour

Choose the **correct** option.

- (1) Five (2) Two
 (3) Four (4) Three

113. Among the given crosses, which one exemplifies the test cross between two plants?

- (1) AaBb × AaBb (2) TTRR × TtRr
 (3) RRYy × RrYy (4) RrYy × rryy

114. Read the given statements regarding angiosperms and choose the **correct** option.

- (A) Within a female gametophyte, three cells grouped together at the micropylar end, constitute the egg apparatus.
 (B) Among animals, particularly bees are the dominant biotic pollinating agents.
 (C) Flowers of maize and castor prevent both autogamy and geitonogamy.
 (D) Emasculation is not needed if female parent produces unisexual flowers.
 (E) The angiosperms exhibit double fertilisation, i.e., two fusion events occur in each embryo sac, namely syngamy and triple fusion.

How many statement(s) is/are **correct**?

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

Space for Rough Work



115. Match List-I with List-II

	List-I		List-II
A.	Haemophilia	(I)	Autosomal recessive disorder
B.	Colour blindness	(II)	Short stature and underdeveloped feminine character
C.	Cystic fibrosis	(III)	A single protein that is part of the cascade of proteins involved in clotting of blood is affected.
D.	Turner's syndrome	(IV)	It occurs in about 8 percent of males and only about 0.4 percent of females

Choose the option with all **correct** matches.

- (1) A(IV); B(III); C(II); D(I)
- (2) A(III); B(IV); C(I); D(II)
- (3) A(IV); B(I); C(III); D(II)
- (4) A(III); B(II); C(I); D(IV)

116. Read the given statements and choose the **correct** option.

Statement A: In addition to recombination, mutation is another phenomenon that leads to variation in DNA. Deletions and insertions of base pairs of DNA, cause frame shift mutations.

Statement B: Since, it is evident that controlled crosses that can be performed in pea plant or some other organisms, are not possible in case of human beings, study of family history about inheritance of a particular trait provides an alternative.

(1) Statement I is correct but statement II is incorrect

(2) Statement I is incorrect but statement II is correct

(3) Both the statements I and II are incorrect

(4) Both the statements I and II are correct

117. ZZ – ZW type of sex-determination is seen in

- (1) *Drosophila* (2) Birds
- (3) Grasshopper (4) Moth

118. Read the given assertion (A) and reason (R) statements and choose the **correct** option.

Assertion (A): Phenylketonuria is an inborn error of metabolism.

Reason (R): Accumulation of phenylpyruvic acid in the brain results in mental retardation.

- (1) Both (A) and (R) are true and (R) is the correct explanation of (A)
- (2) Both (A) and (R) are true but (R) is not the correct explanation of (A)
- (3) (A) is true but (R) is false
- (4) (A) is false but (R) is true

119. Select the **correct** ones regarding endosperm and choose the option accordingly.

- (a) Its development precedes the embryo development.
 - (b) It is a triploid nutritive tissue.
 - (c) It is free nuclear in coconut water of tender coconut
 - (d) Its nature can be starchy and proteinaceous in cereals
- (1) (a) and (d) only
 - (2) (a), (b) and (c) only
 - (3) (b) and (c) only
 - (4) All (a), (b), (c) and (d)

Space for Rough Work



120. In human beings, it is evident that in each pregnancy, there is always _____ probability of either a male or a female child.

Choose the **correct** option to fill in the above blank.

- 121. Match List-I with List-II.**

	List-I		List-II
A.	Gregor Mendel	(I)	Coined the term recombination to describe the generation of non-parental gene combinations
B.	T.H. Morgan	(II)	Suggested that recombination frequencies can be utilized in predicting the sequence of genes on the chromosome
C.	Walter Sutton	(III)	Could not provide any physical proof for existence of factors or the material they were made of
D.	Alfred Sturtevant	(IV)	United the knowledge of chromosomal segregation with Mendelian principles and called it the chromosomal theory of inheritance

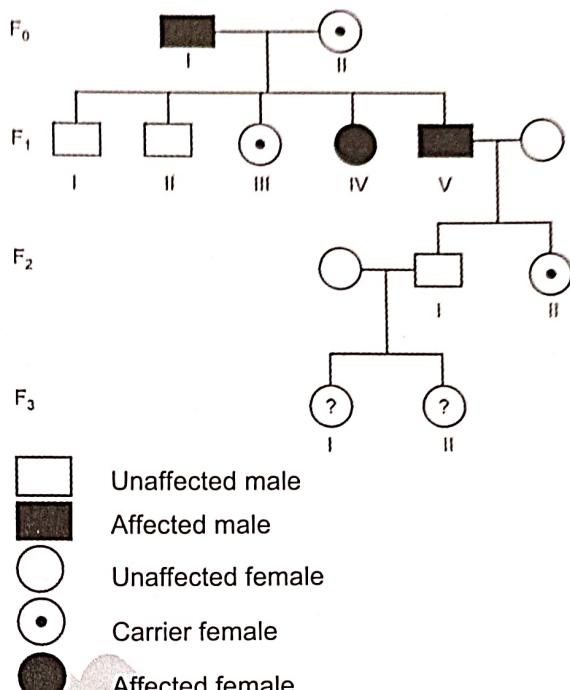
Choose the option with all the **correct** matches.

- (1) A(III); B(IV); C(II); D(I)
 - (2) A(III); B(I); C(IV); D(II)
 - (3) A(IV); B(III); C(I); D(II)
 - (4) A(III); B(IV); C(I); D(II)

122. Which one of the following sets of plant structures has diploid number of chromosomes?

- (1) Nucellus and egg apparatus
 - (2) Synergids, polar nuclei and integuments
 - (3) Secondary nucleus and antipodal cells
 - (4) Megasporangium, megasporangium, nucellus, secondary nucleus

123. Observe the given pedigree chart and select the correct option for it.



- (a) The trait under study could not be phenylketonuria or thalassemia.

(b) It can be true for the inheritance of a recessive sex-linked disease like colour blindness.

(c) The probability of a female child being a carrier for haemophilia in F₃ is 50%.

(d) The genotype of F₁ (II) and (III) can be aa and Aa respectively.

Choose the **correct** one(s).

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

124. Pollen grains are well-preserved as fossils because of

 - (1) The presence of germ pores, where one of the most resistant organic material is deposited
 - (2) The presence of sporopollenin
 - (3) The thin continuous intine layer, made up of pectocellulose
 - (4) Its spherical shape and 25 – 50 μm diameter

Space for Rough Work



125. Read the given events and arrange them in a **correct** sequence of occurrence in a flowering plant.

- (A) Megasporogenesis as a result of meiosis in MMC.
 - (B) Ovary develops into a fruit.
 - (C) Characteristic distribution of cells within the embryo sac, i.e., 8-nucleate and 7-celled.
 - (D) Differentiation of a nucellus cell into MMC.
 - (E) Fusion of a male gamete with two polar nuclei.
- Choose the **correct** answer from the options given below.

- (1) (A), (D), (E), (C), (B) (2) (D), (A), (C), (E), (B)
- (3) (D), (C), (E), (A), (B) (4) (A), (D), (C), (B), (E)

126. Read the given **Assertion (A)** and **Reason (R)** statements and choose the **correct** option.

Assertion (A): The seeds of hybrids of food and vegetable crops have to be produced every year.

Reason (R): If seeds collected from hybrids are sown, the characters in plant progeny will not segregate and thus, unable to maintain hybrid characters.

- (1) Both (A) and (R) are true and (R) is the correct explanation of (A)
- (2) Both (A) and (R) are true but (R) is not the correct explanation of (A)
- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false

127. In which of the following plants, seeds have persistent remnants of nucellus called perisperm?

- (1) Black pepper and bean
- (2) Beet and black pepper
- (3) Pea and bean
- (4) Wheat and castor

128. Read the following characteristics of a plant.

- (a) Flowers have feathery stigma
- (b) Presence of single ovule in each ovary

- (c) Pollen grains are sticky and light

- (d) Male gametophytes are surrounded by mucilaginous covering

- (e) Flowers packed into inflorescence

Which of the above features are **true** for wind-pollinated flowers, e.g., wheat?

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

129. In a young anther, a group of compactly arranged homogenous cells, which occupies the centre of each microsporangium is called

- (1) Tapetum (2) Endothecium
- (3) Connective tissue (4) Sporogenous tissue

130. Read the given statements and choose the **correct** ones.

(A) If starch synthesis is considered, Bb seeds show incomplete dominance as the starch grains produced are of intermediate size.

(B) Completely linked genes in a Mendelian dihybrid cross show F₂ phenotypic ratio of 3 : 1.
(C) Multiple alleles can be detected only in a population.

(D) T.H. Morgan found that the genes for white eye and yellow body were very tightly linked and showed only 1.3% recombination, while the genes for white eye and miniature wings showed 37.2% recombination.

Choose the **correct** option.

- (1) (A) and (B) only
- (2) (C) and (D) only
- (3) (A) and (C) only
- (4) (A), (B), (C) and (D)

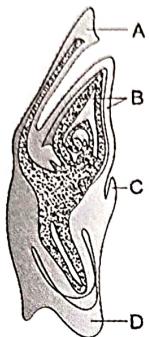
131. Select the **odd** one from the following plants w.r.t. their pollinating agents.

- | | |
|------------------------|--------------------|
| (1) <i>Hydrilla</i> | (2) Water lily |
| (3) <i>Vallisneria</i> | (4) <i>Zostera</i> |

Space for Rough Work



132. Identify the part of an embryo in the given figure which represents the remains of second cotyledon in some grasses.



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

133. Read the given statements and choose the **correct** option.

Statement A: In megasporangium, the central tissue is the nucellus in which the archesporium differentiates.

Statement B: After entering one of the synergids, the pollen tube releases two male gametes into the cytoplasm of the synergid.

- (1) Only statement A is correct
- (2) Only statement B is correct
- (3) Both statements A and B are correct
- (4) Both statements A and B are incorrect

134. Select the **correctly matched pair**.

(1)	Groundnut	-	Endosperm may persist or may get used up completely during seed germination
(2)	Cashew	-	Thalamus contributes to fruit formation
(3)	Sugar cane	-	Flowers are colourful, fragrant and possess nectaries
(4)	<i>Michelia</i>	-	Multicarpellary, syncarpous gynoecium

135. All of the below given plants produce cleistogamous flowers for assured seed set, **except**

- | | |
|-------------------|----------------------|
| (a) <i>Viola</i> | (b) <i>Oxalis</i> |
| (c) <i>Papaya</i> | (d) <i>Commelina</i> |
| (e) Common pansy | |
| (1) (a) and (b) | (2) (c) and (d) |
| (3) (c) only | (4) (b) and (e) |

[ZOOLOGY]

136. In an embryo, the layer which can give rise to all the types of tissues is

- (1) Trophoblast
- (2) Outer cell mass
- (3) Inner cell mass
- (4) Endoderm

137. Choose the **incorrect** match w.r.t. the mentioned structures and their respective functions.

(1)	Interstitial cells	-	Secrete interstitial cell stimulating hormone
(2)	Epididymis	-	Stores and transports the sperms
(3)	Scrotum	-	Helps in maintaining the low temperature of the testis required for spermatogenesis
(4)	Sertoli cells	-	Provide nutrition to the male germ cells

Space for Rough Work



138. Read the following statements:-

- The male external genitalia that acts as a copulatory organ contains the urethra which acts as the passage for ejaculation of semen.
- The enlarged end of the male external genitalia is called glans penis which is covered by a loose fold of skin called foreskin.
- The male sex accessory glands include a paired seminal vesicle, a prostate gland and a paired Cowper's gland.
- Secretion of bulbourethral glands helps in erection of penis.

How many of the above given statements is/are true?

- Two
- One
- Four
- Three

139. How many meiotic divisions are required for the formation of 252 spermatozoa and 252 ootids from a primary spermatocyte and a primary oocyte, respectively?

- 126; 252
- 63; 126
- 63; 252
- 252; 126

140. If menstrual cycle of female is of 38 days then what will be the sum of the total duration of menstruation phase and proliferative phase?

- 14 days
- 24 days
- 28 days
- 16 days

141. Read the following statements carefully and select the correct option.

Statement (A): Ovarian stroma, which is covered by a thin epithelium, is divided into two zones.

Statement (B): All ovarian follicles are found in the cortex and all of the granulosa cells of these follicles are diploid in nature.

- Only statement (A) is correct
- Both statements (A) and (B) are incorrect
- Both statements (A) and (B) are correct
- Only statement (B) is correct

142. Choose the correct statement w.r.t humans.

- The second polar body is formed along with the secondary oocyte in ovary.
- The reductional division that occurs during gametogenesis in females starts at embryonic development stage as compared to the gametogenesis in males.
- LH surge leads to the disintegration of Graafian follicle and endometrium simultaneously.
- In males, differentiation of gametes occurs before the completion of meiosis.

143. Which of the following is a part of intra-testicular genital duct system present in human males?

- Ejaculatory duct
- Vas deferens
- Epididymis
- Rete testis

144. Fraternal twins are/can

- Monozygotic twins
- Develop from two separately fertilised eggs
- Connected to the mother via two separate placentas.
- May have the same sex
- Not necessarily look alike

Choose the option that represents only the true facts.

- (a), (b), (c) and (d)
- (b), (c), (d) and (e)
- (a), (c), (d) and (e)
- (a), (b), (c), and (e)

145. A is a cushion of fatty tissue covered by skin and pubic hair. The B is a tiny finger-like structure which lies at the upper junction of the two C above the urethral opening.

Identify A, B and C and choose the correct option to fill the respective blanks w.r.t the female external genitalia.

- Labia majora; hymen; labia minora
- Mons pubis; clitoris; labia minora
- Mons pubis; clitoris; labia majora
- Labia majora; hymen; mons pubis

Space for Rough Work



146. Complete the analogy by selecting the correct option w.r.t. the layers of uterus.

Middle smooth muscle layer : Myometrium :: _____ : Endometrium

- (1) Inner thin fibrous layer
- (2) Outer layer that exhibits strong contraction
- (3) Outer layer that undergoes cyclic changes
- (4) Inner glandular layer

147. Which of the following is the last part of the oviduct that joins the uterus and is characterized by the presence of the narrowest lumen?

- (1) Ampulla
- (2) Isthmus
- (3) Infundibulum
- (4) Fimbriae

148. In a hypothetical condition, if the fimbriae always fail to collect the ovum after ovulation, then, which of the following conditions will not occur most likely?

- (1) Secondary oocyte may get lost in the coelomic cavity.
- (2) Can lead to infertility in the long term
- (3) Corpus luteum will remain persistent even after 15 days of the ovulation
- (4) Meiosis-II will not get completed

149. Read the following statements

- a. A large number of secondary follicles degenerate during the phase from birth to puberty.
- b. At puberty, only 60,000–80,000 primary follicles are left in each ovary.
- c. Tertiary follicle is characterised by a fluid-filled cavity called antrum.
- d. Primary oocyte within the tertiary follicle grows in size and completes its first meiotic division.

How many of the above given statements is/are true?

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

150. The first menstruation begins at puberty and is called

- (1) Menstrual cycle
- (2) Menarche
- (3) Menopause
- (4) Ovulation

151. Choose the correct set of hormones that are exclusively secreted by placenta.

- (1) Cortisol and prolactin
- (2) Oestrogen and relaxin
- (3) hCG and human-placental lactogen
- (4) hCG and progesterone

152. The concentration of how many of the hormones given in the box below increase several-folds in the maternal blood during pregnancy?

Estrogen, Thyroxine, Prolactin, Cortisol, Progestogens

Select the correct option.

- (1) Four
- (2) Two
- (3) Five
- (4) Three

153. By the end of which time period, the limbs and external genital organs of human foetus are well-developed?

- (1) 7th week of gestation
- (2) By the end of second month of gestation
- (3) 4th week of gestation
- (4) 12th week of gestation

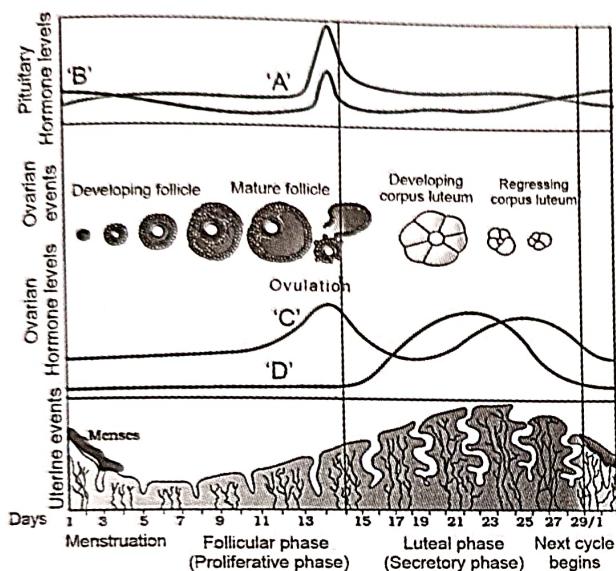
154. If a human male ejaculates about 250 million sperms during a coitus, then, for normal fertility, at least what per cent of the total sperms must have normal shape and size with vigorous motility?

- (1) 40%
- (2) 35%
- (3) 60%
- (4) 24%

Space for Rough Work



155. The graphical representation of fluctuations in ovarian and pituitary hormones during the menstrual cycle is given below. Identify the hormones marked as A, B, C and D and choose the option representing the correct fact w.r.t them.



- (1) Throughout childhood, the ovaries remain inactive due to the absence of pulsatile secretion of steroid 'B'.
- (2) Both 'A' and 'B' bind to the receptors present on the genome of target cells that are present in ovary and stimulate the synthesis of 'C'.
- (3) The increasing level of 'D' from the developing follicle along with the increasing level of 'A' from anterior pituitary, act together to cause proliferation of follicular cells.
- (4) During the follicular phase of the ovarian cycle, certain cells of follicles secrete 'C' which helps to regenerate the endometrium of uterus through proliferation.

156. Introduction of sex education in schools should be encouraged to

- (1) Misguide students about adolescence and related changes
- (2) Make students aware about safe and hygienic sexual practices
- (3) Promote myths about sex-related aspects
- (4) Promote the concept of child marriage amongst youth

157. The human females have a time-limited span of fertility between 'X' and onset of 'Y'.

'X' signals the beginning of a potential reproductive age.

Identify 'X' and 'Y' and choose the option which is not true w.r.t. 'Y'.

- (1) Most women experience a decline in bone mineral density during this stage
- (2) The production of estrogen declines during 'Y', despite copious secretion of FSH and LH by anterior pituitary.
- (3) The pool of ovarian follicles becomes exhausted in both ovaries.
- (4) No follicles are left in ovaries and gonadotropins like FSH are used in ovaries so that it is never detected in urine.

158. Statement (A): Saheli, the oral contraceptive for the females, contains a non-steroidal preparation.

Statement (B): The contraceptive action of the active ingredient present in Saheli (called centchroman), causes asynchrony in preparing uterine lining necessary for implantation.

In the light of above statements, choose the correct option.

- (1) Both statements (A) and (B) are correct
- (2) Both statements (A) and (B) are incorrect
- (3) Only statement (A) is correct
- (4) Only statement (B) is correct

Space for Rough Work



159. Contraceptive methods

- (1) Are regular requirements for the maintenance of reproductive health
- (2) Are practiced against a natural reproductive event
- (3) Are widely used but they do not play any role in checking uncontrolled growth of population
- (4) Should interfere with the libido of a person

160. Match the column I with column II and choose the **correct** option.

	Column I	Column II
a.	Vault	(i) Male condom
b.	Nirodh	(ii) Non-medicated IUD
c.	Implant	(iii) Barrier method
d.	Lippes loop	(iv) Placed under the skin

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

161. Reproductive and Child Health Care programmes aim to focus at all of the following, **except**

- (1) Providing support for building a reproductively healthy society.
- (2) Creating awareness among people about various reproduction related aspects.
- (3) Providing facilities for maintaining a good reproductive health.
- (4) Providing basic education to children of all age groups.

162. Select the **incorrect** statement.

- (1) The primary action of steroid oral contraceptive pills is to inhibit ovulation by suppressing the release of gonadotrophins from hypothalamus.
- (2) Contraceptive diaphragms are reusable.
- (3) In barrier method of contraception, rubber sheath is used to cover the cervix of females.
- (4) Mode of action of implants is similar to that of steroid oral contraceptive pills.

163. For a human female with 38 days long menstrual cycle, the fertile period will range from

- (1) 20th to 27th day
- (2) 18th to 24th day
- (3) 27th to 34th day
- (4) 14th to 21st day

164. Lactational amenorrhea is effective upto a maximum period of intense breastfeeding

- (1) 1 year following parturition due to high level of LH in the mother's blood
- (2) 6 months following parturition
- (3) 5 years following parturition
- (4) 2 years following parturition due to high level of GnRH in the mother's blood

165. Which of the following diseases cannot be detected by amniocentesis?

- (1) Haemophilia
- (2) Down's syndrome
- (3) Colour blindness
- (4) Cleft palate

166. **Assertion (A):** In India, increased health facilities along with better living conditions had an impact on population growth.

Reason (R): A rapid decline in death rate, MMR, IMR and number of people in reproductive age group are probable reasons for the population growth in India.

In the light of above statements, select the **correct** option.

- (1) Both (A) and (R) are true and (R) is the correct explanation of (A)
- (2) Both (A) and (R) are true but (R) is not the correct explanation of (A)
- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false

Space for Rough Work



167. Hormonal contraceptives

- (1) Like IUDs cannot be used as emergency contraceptives
- (2) Like Multiload – 375, make the uterus unsuitable for implantation and the cervix hostile to sperms
- (3) That are categorized as progesterone only pills, thicken the cervical mucus to prevent entry of sperms
- (4) Are used along with the barrier methods like implants to increase their contraceptive efficiency

168. Natural method of contraception that is based on increased plasma concentration of prolactin is

- (1) Coitus interruptus
- (2) Periodic abstinence
- (3) Rhythm method
- (4) Lactational amenorrhea

169. The MTP amendment Act, 2017, was enacted by the Government of India with the intention of

- (a) Reducing the incidences of illegal abortions
- (b) Decreasing the maternal morbidity and mortality
- (c) Providing a legal framework for safe abortions in India

Choose the **correct** option.

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

170. Select the **incorrect** match.

(1)	Surgical intervention for contraception	-	Blocks gamete transport
(2)	Vasectomy	-	Small incision on the scrotum is done for this
(3)	Tubectomy	-	Oviduct is tied up through small incision in the abdomen
(4)	Sterilization method	-	Highly effective and can be easily reversed

171. Inability to conceive or produce children even after _____ months of unprotected sexual co-habitation is called infertility.

Select the **correct** option to fill in the blank.

- (1) 6
- (2) 24
- (3) 18
- (4) 12

172. Which of the following is **correct** w.r.t STIs?

- (1) The people of age group 5 to 10 years are more prone to these infections than the people of age group 15 – 24 years.
- (2) Hepatitis-B, genital herpes and genital warts are completely curable.
- (3) Absence or less significant symptoms in the early stages of these infections and the social stigma attached to STIs, deter the patient from going for timely detection and proper treatment.
- (4) Viral STIs like gonorrhoea and syphilis cause symptoms like itching, fluid discharge, etc.

173. How many of the methods given below in the box do/does not include usually *in vitro* fertilisation?

GIFT, ICSI, ZIFT, IUT, AI

Choose the **correct** option.

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

174. Release of sperm head from the Sertoli cells occurs by the process called

- (1) Spermiogenesis
- (2) Spermiation
- (3) Spermatogenesis
- (4) Gametogenesis

175. Select the true statement w.r.t the morula stage during embryo development of humans.

- (1) It has almost equal amount of DNA as that of blastocyst.
- (2) It gets attached to the lining of the endometrium.
- (3) It contains 8-16 blastomeres.
- (4) It has equal quantity of cytoplasm and DNA as in an uncleaved zygote.

Space for Rough Work

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176. Which of the following is not **incorrect** w.r.t lactation?

- (1) The principle hormone promoting milk synthesis is secreted by the posterior pituitary of the mother.
- (2) Suckling of baby induces the secretion of prolactin, the milk-ejecting hormone.
- (3) Lactation often interrupts or blocks ovarian cycle for a few months following parturition.
- (4) The milk produced during the initial few months of lactation contains high amounts of IgG.

177. Choose the **incorrect** option w.r.t the umbilical cord.

- (1) It is a vital structure connecting the foetus to the placenta.
- (2) Yolk sac is connected to this structure.
- (3) 50 per cent of both maternal and foetal blood flows through the blood vessels present in it.
- (4) Plays a role in waste removal from foetus and transport of nutrients to the foetus

178. Match the given columns w.r.t the structure of human spermatozoa.

	Column I	Column II
A.	Head	(i) Constricted region that contains centriole
B.	Middle piece	(ii) Facilitates sperm motility
C.	Neck	(iii) Nebenkern
D.	Tail	(iv) Possesses 23 highly condensed chromosomes

Choose the **correct** option.

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

179. **Assertion (A):** Regression of the corpus luteum leads to the onset of the next ovarian cycle, in a 5 months pregnant human female.

Reason (R): Chorionic gonadotropin, which has similar function as LH, acts on the corpus luteum to prolong its life in a pregnant human female until placenta is fully functional.

In the light of above statements, choose the correct option.

- (1) Both (A) and (R) are true and (R) is the correct explanation of (A)
- (2) Both (A) and (R) are true but (R) is not the correct explanation of (A)
- (3) (A) is false but (R) is true
- (4) Both (A) and (R) are false

180. All of the following are true for the non-cellular layer surrounding the secondary oocyte, **except**

- (1) Composed of glycoproteins
- (2) Helps to prevent ectopic pregnancy by preventing premature implantation
- (3) Remains intact throughout the cleavage divisions
- (4) Plays no role in preventing polyspermy

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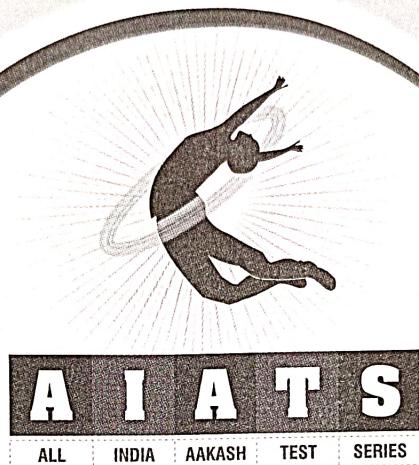
(Video will be live on 09-02-2026 at 12:00 noon onwards)



A
Medical/IT
(AR-U)

Roll No.:

Test Date: 08-02-2026



Aakash DLP/Digital

Medical Entrance Exam - 2026

National Eligibility-cum-Entrance Test (NEET)

TEST No. 5

(XII Passed Students)

INSTRUCTIONS FOR CANDIDATES

1. Read each question carefully.
2. It is mandatory to use Blue/Black Ball Point Pen to darken the appropriate circle in the answer sheet.
3. Mark should be dark and should completely fill the circle.
4. Rough work must not be done on the answer sheet.
5. Do not use white-fluid or any other rubbing material on answer sheet. No change in the answer once marked is allowed.
6. Student cannot use log tables and calculators or any other material in the examination hall.
7. Before attempting the question paper, student should ensure that the test paper contains all pages and no page is missing.
8. Before handing over the answer sheet to the invigilator, candidate should check that Roll No. and Centre Code have been filled and marked correctly.
9. Immediately after the prescribed examination time is over, the answer sheet to be returned to the invigilator.
10. (i) The question paper consists of 180 compulsory questions (45 questions each in Physics and Chemistry and 90 questions in Biology (Botany & Zoology)). The total duration of the examination will be 180 minutes (3 Hrs). (ii) Each correct answer carries four marks. One mark will be deducted for each incorrect answer from the total score.

Note : It is compulsory to fill Roll No. and Test Booklet Code on answer sheet, otherwise your answer sheet will not be considered.