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TEST BOOKLET NO.107

TEST BOOKLET CODE

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Test Series - NEET

TEST - 07

NEET(UG)-2026

T-07

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

Syllabus

Physics: Moving Charge, Magnetism, EMI & AC

Chemistry : Optical Isomerism, Alkyl and Arylhalides, Alcohol, Ether & Phenol

Biology : Molecular Basis of Inheritance, Evolution

Important Instructions :

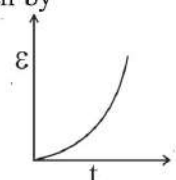
1. This test is of **3 Hours** duration.
2. The Test Booklet contains **180** multiple-choice questions [four options (1), (2), (3) & (4) with a single correct answer] from **Physics (45 Questions), Chemistry (45 Questions) & Biology (90 Questions)**.
All questions are compulsory.
3. Each question carries **4** marks. For each correct response, the candidate will get **4** marks. For each incorrect response, **1** mark will be deducted from the total score. No mark will be deducted for the questions which have not been answered. The maximum marks is **720**.
4. Use **Blue/Black Ball Point Pen only** for writing particulars on this page/special Answer Sheet (OMR).
5. Do not encode or darken more than one circle for answering a particular question for it will be treated as a wrong answer.
6. Rough work is to be done on the space provided for this purpose in the Test Booklet only.
7. Calculators, Slide Rules, Log Tables, Geometry Box, Electronic Digital Watches with facilities of calculators, cellular phones, pagers or any other electronic gadget are not allowed inside the Examination Hall.

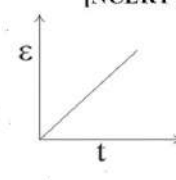
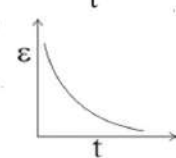
Name of the Candidate (in Capital) : _____

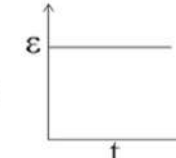
Centre Name (in Capital) : _____ Date : _____

Candidate's Signature : _____ Invigilator's Signature : _____

PART-I: PHYSICS

1. A planar coil having 12 turns carries 15 A current. The coil is oriented with respect to the uniform magnetic field $\vec{B} = 0.2\hat{i}$ T such that its directed area is $\vec{A} = -0.04\hat{i}m^2$. The potential energy of the coil in the given orientation is [NCERT Page 139]
 (1) 0 (2) +0.72J (3) +1.44J (4) -1.44J
2. A rectangular metallic loop is moving out of a uniform magnetic field region to a field free region with a constant speed. When the loop is partially inside the magnetic field, the plot of magnitude of induced emf (ϵ) with time (t) is given by [NCERT Page 163]
- (1) 

(2) 
- (3) 

(4) 
3. An alternating current is given by $I = I_A \sin \omega t + I_B \cos \omega t$. The r.m.s. current will be [NCERT Page 180]
 (1) $\sqrt{I_A^2 + I_B^2}$ (2) $\frac{\sqrt{I_A^2 + I_B^2}}{2}$
 (3) $\sqrt{\frac{I_A^2 + I_B^2}{2}}$ (4) $\frac{|I_A + I_B|}{\sqrt{2}}$
4. A proton and an α -particle enter a uniform magnetic field perpendicular with the same speed. If proton takes 20 μ s to make 5 revolutions, then the periodic time for the α -particle would be
 (1) 5 μ s (2) 8 μ s
 (3) 10 μ s (4) 16 μ s
5. A particle of charge per unit mass α is released from origin with a velocity $\vec{v} = v_0\hat{i}$ in a uniform magnetic field $\vec{B} = -B_0\hat{k}$. If the particle passes through (0, y, 0) then y is equal to
 (1) $-\frac{2v_0}{B_0\alpha}$ (2) $\frac{v_0}{B_0\alpha}$
 (3) $\frac{2v_0}{B_0\alpha}$ (4) $-\frac{v_0}{B_0\alpha}$
6. Which one of the following characteristics is not associated with a ferromagnetic material [NCERT Page 148, 149]
 (1) It is strongly attracted by a magnet
 (2) It tends to move from a region of strong magnetic field to a region of weak magnetic field
 (3) Its origin is the spin of electrons
 (4) Above the Curie temperature, it exhibits paramagnetic properties
7. A planar loop of wire rotates in a uniform magnetic field. Initially, at $t = 0$, the plane of the loop is perpendicular to the magnetic field. If it rotates with a period of 10 s about an axis in its plane then the magnitude of induced emf will be maximum and minimum, respectively at: [NCERT Page 158]
 (1) 2.5 s and 7.5 s (2) 2.5 s and 5.0 s
 (3) 5.0 s and 7.5 s (4) 5.0 s and 10.0 s
8. A transformer has an efficiency of 80% and works at 10V and 4 kW. If the secondary voltage is 240 V, then the current in the secondary coil is: [NCERT Page 195]
 (1) 1.33A (2) 13.33A
 (3) 1.59 A (4) 15.1 A
9. A coil in the shape of an equilateral triangle of side 0.02 m is suspended from its vertex such that it is hanging in a vertical plane between the pole pieces of permanent magnet producing a uniform magnetic field of 5×10^{-2} T. If a current of 0.1 A is passed through the coil, what is the couple acting [NCERT Page 125]
 (1) $5\sqrt{3} \times 10^{-7} Nm$ (2) $5\sqrt{3} \times 10^{-10} Nm$
 (3) $\frac{\sqrt{3}}{5} \times 10^{-7} Nm$ (4) None of these
10. The magnetic potential at a point on the axial line of a bar magnet of dipole moment M is V. What is the magnetic potential due to a bar magnet of dipole moment $\frac{M}{4}$ at the same point? [NCERT Page 140, 141]
 (1) 4V (2) 2V
 (3) $\frac{V}{2}$ (4) $\frac{V}{4}$
11. A solenoid having area A and length 'l' is filled with a material having relative permeability 2. The magnetic energy stored in the solenoid is : [NCERT Page 169, 170]

$$(1) \frac{B^2 A l}{\mu_0} \quad (2) \frac{B^2 A l}{2\mu_0}$$

$$(3) B^2 A l \quad (4) \frac{B^2 A l}{4\mu_0}$$

12. A circuit element X when connected to an a.c. supply of peak voltage 100 V gives a peak current of 5 A which is in phase with the voltage. A second element Y when connected to the same a.c. supply also gives the same value of peak current which lags behind the voltage by $\frac{\pi}{2}$. If X and Y are connected in series to the same supply, what will be the rms value of the current in ampere?

[NCERT Page 180, 187]

$$(1) \frac{10}{\sqrt{2}} \quad (2) \frac{5}{\sqrt{2}}$$

$$(3) 5\sqrt{2} \quad (4) \frac{5}{2}$$

13. A proton moving with a constant velocity passes through a region of space without any change in its velocity. If \vec{E} and \vec{B} represent the electric and magnetic fields respectively, then the region of space may have:

- (A) $E=0, B=0$ (B) $E=0, B \neq 0$
 (C) $E \neq 0, B=0$ (D) $E \neq 0, B \neq 0$

Choose the most appropriate answer from the options given below:

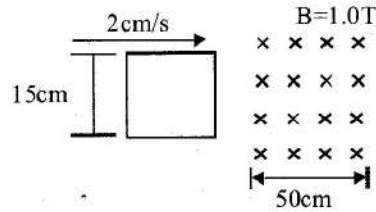
- (1) (A), (B) and (C) only
 (2) (A), (C) and (D) only
 (3) (A), (B) and (D) only
 (4) (B), (C) and (D) only

14. A particle with a specific charge(s) is fired with a speed v towards a wall at a distance d , perpendicular to the wall. What minimum magnetic field must exist in this region for the particle doesn't hit the wall?

- (1) v/sd
 (2) $2v/sd$
 (3) $v/2sd$
 (4) $v/4sd$

15. A square loop of side 15 cm being moved towards right at a constant speed of 2 cm/s as shown in figure. The front edge enters the 50 cm wide magnetic field at $t = 0$. The value of induced emf in the loop at $t = 10$ s will be:

[NCERT Page 158]



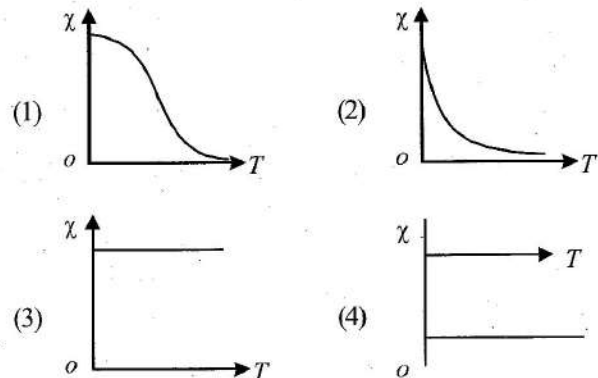
- (1) 0.3 mV (2) 4.5 mV
 (3) zero (4) 3 mV

16. The electric current in a circular coil of four turns produces a magnetic induction 32 T at its centre. The coil is unwound and is rewound into a circular coil of single turn, the magnetic induction at the centre of the coil by the same current will be:

[NCERT Page 116]

- (1) 8 T (2) 4 T (3) 2 T (4) 16 T

17. The variation of magnetic susceptibility (χ) with absolute temperature T for a ferromagnetic material is



18. A galvanometer having a resistance of 20Ω and 30 division on both sides has figure of merit 0.005 ampere/division. The resistance that should be connected in series such that it can be used as a voltmeter upto 15 volt, is:

[NCERT Page 130, 131]

- (1) 100Ω (2) 120Ω (3) 80Ω (4) 125Ω

19. A long straight wire of circular cross-section (radius a) is carrying steady current I . The current I is uniformly distributed across this cross-section. The magnetic field is

[NCERT Page 119, 120]

- (1) Zero in the region $r < a$ and inversely proportional to r in the region $r > a$
 (2) Inversely proportional to r in the region $r < a$ and uniform throughout in the region $r > a$
 (3) Directly proportional to r in the region $r < a$ and inversely proportional to r in the region $r > a$
 (4) Uniform in the region $r < a$ and inversely proportional to distance r from the axis, in the region $r > a$

20. Two coaxial solenoids are made by winding thin insulated wire over a pipe of cross-sectional area $A = 10 \text{ cm}^2$ and length = 20 cm. If one of the solenoid has 300 turns and the other 400 turns, their mutual inductance is

$$(\mu_0 = 4\pi \times 10^{-7} \text{ Tm A}^{-1}) \quad [\text{NCERT Page 166, 167}]$$

- (1) $2.4\pi \times 10^{-5} \text{ H}$ (2) $4.8\pi \times 10^{-4} \text{ H}$
 (3) $4.8\pi \times 10^{-5} \text{ H}$ (4) $2.4\pi \times 10^{-4} \text{ H}$

21. A proton, a deuteron and an α -particle are projected perpendicular to the direction of a uniform magnetic field with same kinetic energy. The ratio of the radii of the circular paths described by them is [NCERT Page 112]

- (1) $1:\sqrt{2}:\sqrt{2}$ (2) $1:\sqrt{2}:1$
 (3) $\sqrt{2}:\sqrt{2}:1$ (4) $\sqrt{2}:1:1$

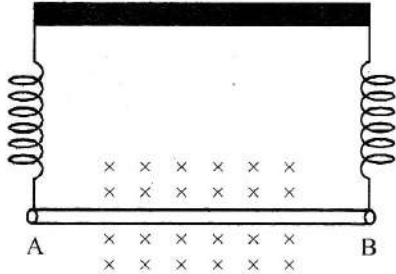
22. Magnetic permeability is maximum for

[NCERT Page 147]

- (1) diamagnetic substance
 (2) paramagnetic substance
 (3) ferromagnetic substance
 (4) (1) and (3)

23. A straight wire AB of mass 40 g and length 50 cm is suspended by a pair of flexible leads in uniform magnetic field of magnitude 0.40 T as shown in the figure. The magnitude of the current required in the wire to remove the tension in the supporting leads is.

(Take $g = 10 \text{ ms}^{-2}$). [NCERT Page 110]



- (1) 2A (2) 4A
 (3) 6A (4) 8A

24. A rectangular loop of length 2.5 m and width 2 m is placed at 60° to a magnetic field of 4 T. The loop is removed from the field in 10 sec. The average emf induced in the loop during this time is [NCERT Page 158]

- (1) -2V (2) +2V
 (3) +1V (4) -1V

25. A straight wire of mass 200 g and length 1.5 m carries a current of 2 A. It is suspended in mid-air by a uniform horizontal magnetic field B. The magnitude of B (in tesla) is (assume $g = 9.9 \text{ m s}^{-2}$) [NCERT Page 110]

- (1) 2 (2) 1.5
 (3) 0.55 (4) 0.66

26. Diamagnetism occurs in

- (1) Paramagnetic material only
 (2) Diamagnetic material only
 (3) Ferromagnetic material only
 (4) In all 3 magnetic materials

27. If a diamagnetic substance is brought near north or south pole of a bar magnet, it is [NCERT Page 147, 148]

- (1) Attracted by the poles
 (2) Repelled by the poles
 (3) Repelled by the north pole and attracted by the south pole
 (4) Attracted by the north pole and repelled by the south pole

28. A LCR series A.C. circuit is turned to resonance. The impedance of the circuit is now [NCERT Page 187]

- (1) R

(2) $\left[R^2 + \left(\frac{1}{\omega C} - \omega L \right)^2 \right]^{1/2}$

(3) $\left[R^2 + (\omega L)^2 + \left(\frac{1}{\omega C} \right)^2 \right]^{1/2}$

(4) $\left[R^2 + \left(\omega L - \frac{1}{\omega C} \right)^2 \right]^{1/2}$

29. A transformer is employed to reduce 220 V to 11 V. The primary draws a current of 5 A and the secondary 90 A. The efficiency of the transformer is [NCERT Page 195]

- (1) 20% (2) 40%
 (3) 70% (4) 90%

30. Lenz's law is a consequence of the law of conservation of [NCERT Page 160]

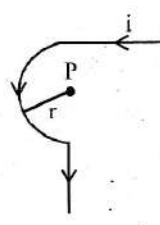
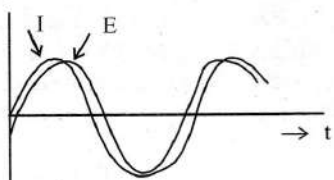
- (1) charge (2) mass
 (3) energy (4) momentum

31. Magnetic lines of force due to a bar magnet do not intersect because [NCERT Page 138]

- (1) a point always has a single net magnetic field
 (2) the lines have similar charges and so repel each other
 (3) the lines always diverge from a single force
 (4) None of these

32. A long solenoid carrying a current produces a magnetic field B along its axis. If the current is double and the number of turns per cm is halved, the new value of the magnetic field is [NCERT Page 121, 122]

- (1) 4B (2) B/2
 (3) B (4) 2B

33. A coil is placed perpendicular to a magnetic field of 5000 T. When the field is changed to 3000 T in 2 s, an induced emf of 22 V is produced in the coil. If the diameter of the coil is 0.02 m, then the number of turns in the coil is :
[NCERT Page 158]
- (1) 70 (2) 140
(3) 35 (4) 7
34. A galvanometer has a coil of resistance 200Ω with a full scale deflection at $20 \mu\text{A}$. The value of resistance to be added to use it as an ammeter of range $(0 - 20) \text{ mA}$ is:
[NCERT Page 130]
- (1) 0.40Ω (2) 0.20Ω
(3) 0.50Ω (4) 0.10Ω
35. In a moving coil galvanometer, two moving coils M_1 and M_2 have the following particulars :
 $R_1 = 5 \Omega, N_1 = 15, A_1 = 3.6 \times 10^{-3} \text{ m}^2, B_1 = 0.25 \text{ T}$
 $R_2 = 7 \Omega, N_2 = 21, A_2 = 1.8 \times 10^{-3} \text{ m}^2, B_2 = 0.50 \text{ T}$
Assuming that torsional constant of the springs are same for both coils, what will be the ratio of voltage sensitivity of M_1 and M_2 ?
[NCERT Page 130, 131]
- (1) 1 : 1 (2) 1 : 4
(3) 1 : 3 (4) 1 : 2
36. A transformer operating at primary voltage 8 kV and secondary voltage 160 V serves a load of 80 kW. Assuming the transformer to be ideal with purely resistive load and working on unity power factor, the loads in the primary and secondary circuit would be
[NCERT Page 194, 195]
- (1) 800Ω and 1.06Ω
(2) 10Ω and 500Ω
(3) 800Ω and 0.32Ω
(4) 1.06Ω and 500Ω
37. A bar magnet is cut into two equal halves by a plane parallel to the magnetic axis. Of the following physical quantities the one which remains unchanged is
[NCERT Page 139, 140]
- (1) pole strength
(2) magnetic moment
(3) intensity of magnetisation
(4) None of these
38. Find the magnetic field at the point P in figure. The curved portion is a semicircle connected to two long straight wires.
[NCERT Page 114, 116]
- (1) $\frac{\mu_0 i}{2r} \left(\frac{1}{2} + \frac{1}{2\pi} \right)$
(2) $\frac{\mu_0 i}{2r} \left(1 + \frac{1}{\pi} \right)$
(3) $\frac{\mu_0 i}{2r} \left(1 + \frac{2}{\pi} \right)$
(4) $\frac{\mu_0 i}{2r} \left(\frac{1}{2} + \frac{1}{\pi} \right)$
- 
39. A coil has 200 turns and area of 70 cm^2 . The magnetic field perpendicular to the plane of the coil is 0.3 Wb/m^2 and take 0.1 sec to rotate through 180° . The value of the induced e.m.f. will be
[NCERT Page 158]
- (1) 8.4V (2) 84V
(3) 42V (4) 4.2V
40. In an a.c. circuit, voltage and current are given by :
 $V = 100 \sin(100t) \text{ V}$ and
 $I = 100 \sin\left(100t + \frac{\pi}{3}\right) \text{ mA}$ respectively.
The average power dissipated in one cycle is:
[NCERT Page 191]
- (1) 10 W (2) 2.5 W
(3) 25 W (4) 5 W
41. A bulb and a capacitor are connected in series across an ac supply. A dielectric is then placed between the plates of the capacitor. The glow of the bulb:
[NCERT Page 187]
- (1) increases (2) remains same
(3) becomes zero (4) decreases
42. In an ac circuit, the instantaneous current is zero, when the instantaneous voltage is maximum in this case, the source may be connected to :
[NCERT Page 187]
- A. pure inductor
B. pure capacitor
C. pure resistor
D. combination of an inductor and capacitor
Choose the correct answer from the options given below:
- (1) A, B and C only (2) B, C and D only
(3) A and B only (4) A, B and D only
43. In a coil, the current changes from -2 A to $+2 \text{ A}$ in 0.2 s and induces an emf of 0.1 V. The self inductance of the coil is:
[NCERT Page 168]
- (1) 5 mH (2) 1 mH
(3) 2.5 mH (4) 4 mH
44. The magnetic field at point P due to semi-infinite long current carrying wire will be given by
- (1) $\frac{\mu_0 I}{4\pi a}$ (2) $\frac{\mu_0 I}{2\pi(\sqrt{2}a)}$
(3) $\frac{\mu_0 I}{4\pi a} \left(1 + \frac{1}{\sqrt{2}} \right)$ (4) $\frac{\mu_0 I}{4\pi a} \left(1 - \frac{1}{\sqrt{2}} \right)$
45. When an AC source of e.m.f. $E = E_0 \sin(100t)$ is connected across a circuit, the phase difference between the e.m.f. E and the current I is observed to be $\frac{\pi}{4}$, as shown in the figure. If the circuit consists possible only of RC or RL in series, which of the following combinations is possible?
[NCERT Page 187, 188]
- 
- (1) $R = 1 \text{ k}\Omega, C = 10 \mu\text{F}$ (2) $R = 1 \text{ k}\Omega, C = 1 \mu\text{F}$
(3) $R = 1 \text{ k}\Omega, L = 10 \text{ H}$ (4) $R = 1 \text{ k}\Omega, L = 1 \text{ H}$

CHEMISTRY

46. When hydrochloric acid gas is treated with propene in presence of benzoyl peroxide, it gives **[NCERT, Page 165]**

- (1) 2-chloropropane
- (2) allyl chloride
- (3) n-propyl chloride
- (4) No reaction occurs

47. The reaction of toluene with Cl_2 in presence of FeCl_3 gives 'X' and reaction in presence of light gives 'Y'. Thus, 'X' and 'Y' are

[NCERT, Page 165, 166]

- (1) X = Benzal chloride, Y = o - Chlorotoluene
- (2) X = m - Chlorotoluene, Y = p - Chlorotoluene
- (3) X = o — and p — Chlorotoluene, Y = Trichloromethyl—benzene
- (4) X = Benzyl chloride, Y = m — Chlorotoluene

48. Which of the following compounds can be classified as aryl halides? **[NCERT, Page 168]**

- (A) P - $\text{ClC}_6\text{H}_4\text{CH}_2\text{CH}(\text{CH}_3)_2$
- (B) P - $\text{CH}_3\text{CHCl}(\text{C}_6\text{H}_4)\text{CH}_2\text{CH}_3$
- (C) O - $\text{BrH}_2\text{C} - \text{C}_6\text{H}_4\text{CH}(\text{CH}_3)\text{CH}_2\text{CH}_3$
- (D) $\text{C}_6\text{H}_5\text{Cl}$

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

49. Arrange the following in the decreasing order of acidic strength **[NCERT, Page 207]**

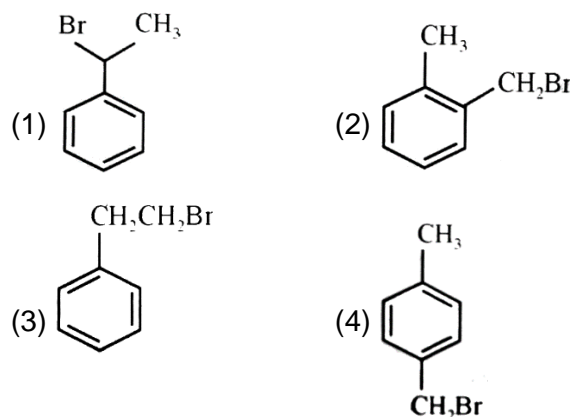
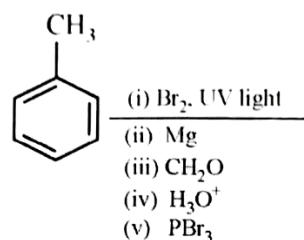
Phenol, *p*-nitrophenol, *m*-cresol, *p*-cresol

I II III IV

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

50. The major product in the following reactions is

[NCERT, Page 164]



51. Match Column-I with Column-II.

[NCERT, Page 160]

Column-I

Column-II

- | | |
|--|----------------------------|
| (A) $\text{CH}_2 = \text{CH} - \text{CH}_2\text{Cl}$ | (p) <i>gem</i> -Dichloride |
| (B) $\text{CH}_2 = \text{CHX}$ | (q) Vinylic halide |
| (C) CH_3CHCl_2 | (r) <i>vic</i> -Dichloride |
| (D) $\text{CH}_2\text{ClCH}_2\text{Cl}$ | (s) Allylic halide |
- (1) A - (r), B - (q), C - (p), D - (s)
 - (2) A - (q), B - (p), C - (s), D - (r)
 - (3) A - (s), B - (q), C - (p), D - (r)
 - (4) A - (r), B - (p), C - (s), D - (q)

52. Read the following $\text{S}_{\text{N}}2$ statements and choose the correct code **[NCERT, Page 173]**

- (A) $\text{S}_{\text{N}}2$ reactions follows a second order kinetics whereas $\text{S}_{\text{N}}1$ reactions follows the first order kinetics.
- (B) $\text{S}_{\text{N}}1$ reactions follows the second order kinetics whereas $\text{S}_{\text{N}}2$ follows the first order kinetics.
- (C) $\text{S}_{\text{N}}2$ reactions take place in a single step whereas $\text{S}_{\text{N}}1$ reactions take place in two steps.
- (D) Tertiary alkyl halides are least reactive towards $\text{S}_{\text{N}}2$ reactions but we observe high reactivity towards $\text{S}_{\text{N}}1$ reaction.

(1) (B) and (D) are correct.

(2) (A), (C) and (D) are correct

(3) (A), (B) and (D) are correct

(4) (B), (C) and (D) are correct

53. Ethanoic acid undergoes Hell-Volhard-Zelinsky reaction but methanoic acid does not because of **[NCERT, Page 253]**

(1) absence of α -H atom in ethanoic acid

(2) higher acidic strength of ethanoic acid than methanoic acid

(3) presence of α -H atom in methanoic acid

(4) presence of α -H atom in ethanoic acid.

54. Which one of the following is not true for the hydrolysis of t-butyl bromide with aqueous NaOH? **[NCERT, Page 173]**

(1) Reaction occurs through the S_N1 mechanism.

(2) The intermediate formed is a carbocation.

(3) Rate of the reaction doubles when the concentration of alkali is doubled.

(4) Rate of the reaction doubles when the concentration of t-butyl bromide is doubled.

55. Propanoic acid undergoes HVZ reaction to give a product. The product obtained is

[NCERT, Page 253]

(1) stronger acid than propanoic acid

(2) as stronger as propanoic acid

(3) weaker acid than propanoic acid

(4) stronger than dichloropropanoic acid.

56. Match the List-I with List-II

[NCERT, Page 165, 166, 186]

List-I Name reaction	List-II Product obtainable
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(A) Swarts reaction (p) Ethyl benzene

(B) Sandmeyer's reaction (q) Ethyl iodide

(C) Wurtz Fittig reaction (r) Cyanobenzene

(D) Finkelstein reaction (s) Ethyl fluoride

Choose the correct answer from the options given below:

(1) A-(q), B-(r), C-(p), D-(s)

(2) A-(s), B-(p), C-(r), D-(q)

(3) A-(s), B-(r), C-(p), D-(q)

(4) A-(q), B-(p), C-(r), D-(s)

57. 2-Bromopentane is treated with alcoholic KOH solution. The major product formed in this reaction and the type of reaction respectively are **[NCERT, Page 180]**

(1) pent-2-ene, β -elimination

(2) pent-1-ene, β -elimination

(3) 2-pentanol, nucleophilic substitution

(4) pent-1-ene, nucleophilic substitution

58. Which is most reactive for S_N2 reactions?

[NCERT, Page 174]

(1) CH_3I

(2) C_2H_5I

(3) C_3H_7I

(4) C_4H_9I

59. $C_6H_5-CH=CHCHO \xrightarrow{X} C_6H_5CH=CHCH_2OH$

In the above sequence X can be

(1) H_2/Ni

(2) $NaBH_4$

(3) K_2CrO_7/H^+

(4) Both (1) and (2)

60. Methylphenyl ether can be obtained by reacting **[NCERT, Page 215]**

(1) phenolate ions and methyl iodide

(2) methoxide ions and bromobenzene

(3) methanol and phenol

(4) bromobenzene and methyl bromide

61. Which of the following can work as dehydrating agent for alcohols?

[NCERT, Page 209]

(1) H_2SO_4

(2) Al_2O_3

(3) H_3PO_4

(4) All of these

62. Match the following product

[NCERT, Page 213]

Reactions

(A) Nitration

(B) Friedel-Craft acylation

(C) Kolbe's reaction

(D) Reimer Tieman Reaction

Reagents

- (p) $\text{CH}_3\text{COCl} + \text{AlCl}_3$
 (q) Conc. HNO_3 + conc. H_2SO_4
 (r) CO_2 , NaOH
 (s) CHCl_3 + aq. NaOH
 (1) A-(s), B-(r), C-(p), D-(q)
 (2) A-(r), B-(p), C(s), D(q)
 (3) A-(s), B-(r), C(q), D-(p)
 (4) A-(q), B(p), C(r), D-(s)

63. The dehydration of neo-pentanol gives mainly

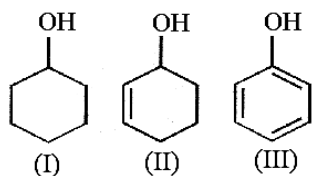
- (1) $\text{CH}_3 - \underset{\text{CH}_3}{\text{CH}} - \text{CH} = \text{CH}_2$
 (2) $\text{CH}_3 - \underset{\text{CH}_3}{\text{CH}} - \text{CH}_2 = \text{CH}_2$
 (3) $\text{CH}_3 - \underset{\text{CH}_3}{\text{C}} = \text{CH} - \text{CH}_3$
 (4) None of the above

64. Which of the following is not an example of allylic halide? [NCERT, Page 160]

- (1) 4-chlorobut-1-ene
 (2) 1-chlorobut-2-ene
 (3) 3 chloro 2 methyl but-1-ene
 (4) 4-chloropent-2-ene

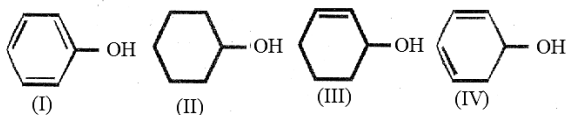
65. The correct order of acidic strength is

[NCERT, Page 208]



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

66. Dehydration of the following in increasing order is [NCERT, Page 209]

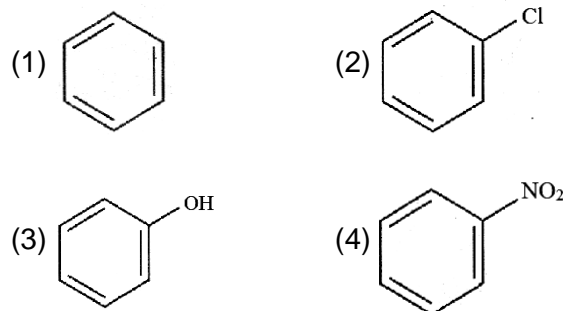


- (1) I < II < III < IV
 (2) II < III < IV < I

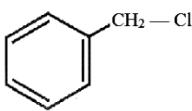
- (3) I < II < III < IV
 (4) I < IV < II < III

67. In Wurtz-Fittig reaction a compound X reacts with alkyl halide. What is X?

[NCERT, Page 186]



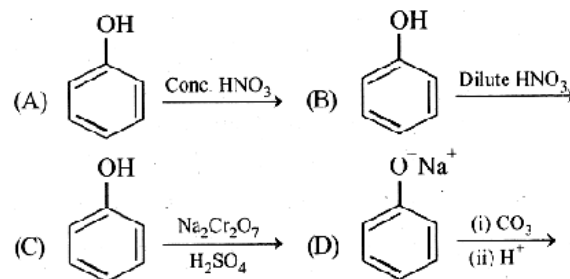
68. The organic halide, which does not undergo hydrolysis by $\text{S}_{\text{N}}1$ mechanism is

- (1) 
 (2) $\text{CH}_2 = \text{CH} - \text{CH}_2\text{Cl}$
 (3) $(\text{CH}_3)_3\text{C} - \text{Cl}$
 (4) $\text{CH}_3 - \text{CH} = \text{CH} - \text{Cl}$

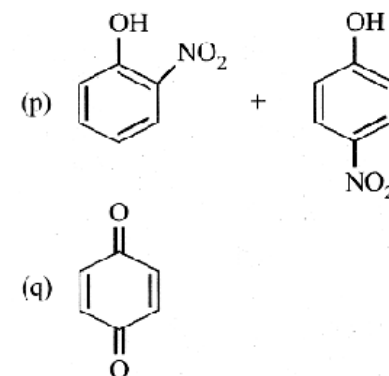
69. Match the Column I with Column II.

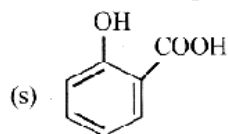
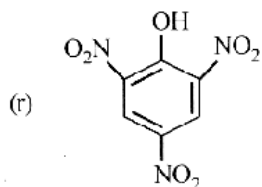
[NCERT, Page 210]

Column I



Column II





- (1) A-(s), B-(p), C - (q), D-(r)
 (2) A-(r), B-(p), C- (q), D-(s)
 (3) A-(q), B-(s), C-(r), D-(p)
 (4) A-(s), B-(q), C- (p), D-(r)

70. Match the reactions given in Column-I with the suitable reagents given in Column-II

[NCERT, Page 238]

Column-I (Reactions)	Column-II (Reagents)
(A) Benzophenone → Diphenylmethane	(p) LiAlH ₄
(B) Benzaldehyde → 1-Phenylethanol	(q) DIBAL-H
(C) Cyclohexanone → Cyclohexanol	(r) Zn(Hg)/Conc.HCl
(D) Phenyl benzoate → Benzaldehyde	(s) CH ₃ MgBr

- (1) A-(s), B(p), C-(q), D-(r)
 (2) A-(q), B-(r), C-(s), D-(p)
 (3) A-(q), B-(s), C-(r), D-(p)
 (4) A-(r), B-(s), C-(p), D-(q)

71. On sulphonation of C₆H₅Cl

[NCERT, Page 184]

- (1) *m*-chlorobenzenesulphonic acid is formed
 (2) benzenesulphonic acid is formed
 (3) *o*-chlorobenzenesulphonic acid is formed
 (4) mixture of *o*- and *p*-chlorobenzenesulphonic acid is formed

72. Which of the following statements are correct?

[NCERT, Page 198]

- (A) In phenols, the -OH group is attached to

sp² hybridized carbon of an aromatic ring.

(B) The carbon - oxygen bond length (136 pm) in phenol is slightly more than that in methanol.

(C) Partial double bond character is due to the conjugation of unshared electron pair of oxygen with the aromatic ring.

(D) Phenol has sp² hybridized state of oxygen.

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

73. Which of the following statements are not correct? [NCERT, Page 203]

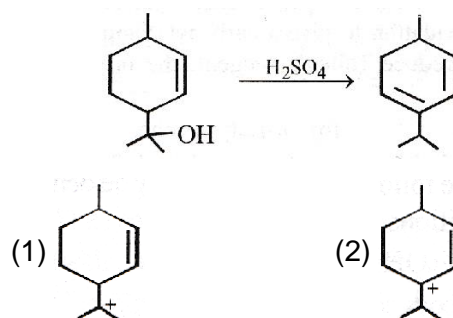
- (A) Alcohols are weaker acids than water.
 (B) Acid strength of alcohols decrease in the following RCH₂OH > R₂CHOH > R₃COH.
 (C) Carbon-oxygen bond length in methanol is shorter than that C-O bond length in phenol.

(D) The bond angle in methanol is 108.9.

(E) Alcohols can be prepared by ozonolysis of alkene.

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

74. Which carbocation is prepared in the given reaction mechanism to give final product?

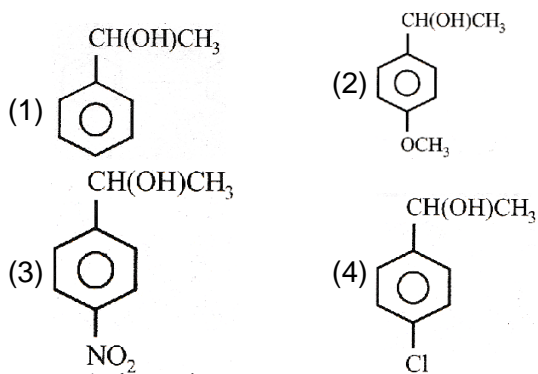


- (3) Both (4) None

75. The reaction of CH₃MgBr with acetone and hydrolysis of the resulting product gives

- (1) CH₂CH₂CH₂OH
 (2) CH₂CH₂CH₂CH₂OH
 (3) (CH₃)₂CHOH
 (4) (CH₃)₃COH

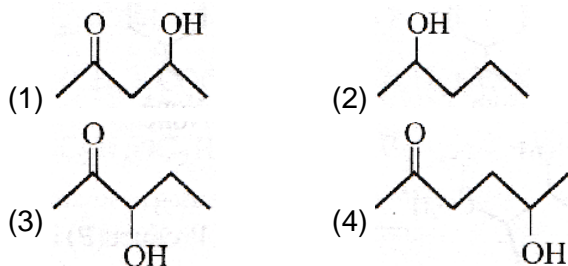
76. Which of the following alcohols is dehydrated most readily with concentration H_2SO_4 ?



77. A compound of the formula $C_4H_{10}O$ reacts with sodium and undergoes oxidation to give a carbonyl compound which does not reduce Tollen's reagent, the original compound is

- (1) Diethyl ether (2) *n*-Butyl alcohol
 (3) Isobutyl alcohol (4) *sec*-Butyl alcohol

78. Which of the following will most readily be dehydrated in acidic conditions?



79. An unknown alcohol is treated with the "Lucas reagent" to determine whether the alcohol is primary, secondary or tertiary. Which alcohol reacts fastest and by what mechanism:

- (1) secondary alcohol by S_N1
 (2) tertiary alcohol by S_N1
 (3) secondary alcohol by S_N2
 (4) tertiary alcohol by S_N2

80. The following compounds are given :

- (I) CH_3CH_2OH (II) CH_3COCH_3
 (III) $CH_3 - \underset{\begin{array}{c} | \\ CH_3 \end{array}}{CHOH}$ (IV) CH_3OH

Which of the above compound(s), on being warmed with iodine solution and NaOH, will give iodoform?

- (1) I and II (2) I, III and IV
 (3) Only I (4) I, II and III

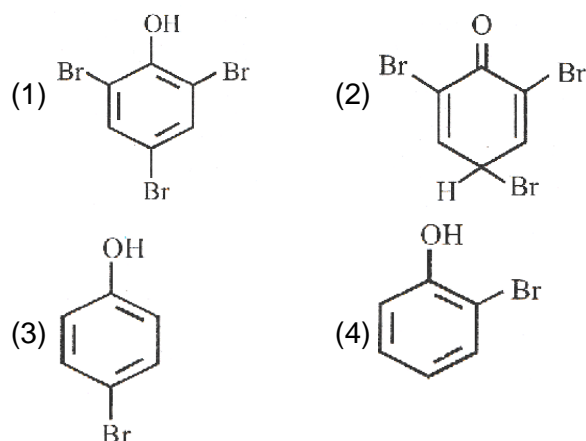
81. Which statement is not correct about alcohol?

- (1) Molecular weight of alcohol is higher than water.
 (2) Alcohol of less no. of carbon atoms is less soluble in water than alcohol of more no. of carbon atoms.

(3) Alcohol evaporates quickly.

(4) All of these.

82. What is the structure of the major product when phenol is treated with bromine water?

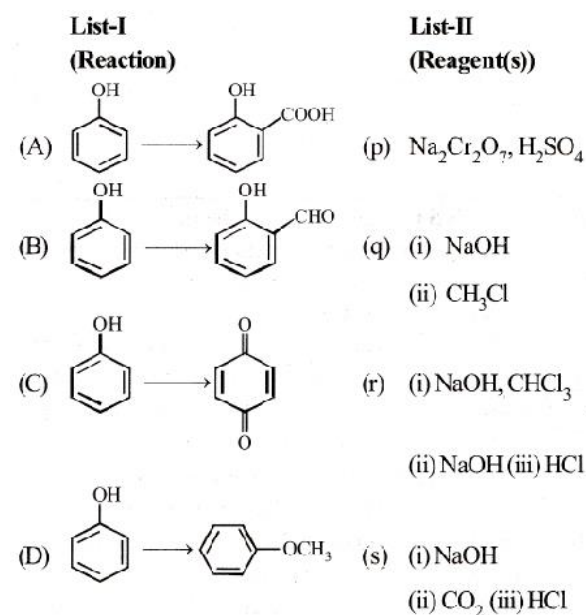


83. **Statement I:** Phenol is more reactive than benzene towards electrophilic substitution reactions.

Statement II: In case of phenol, the intermediate carbocation is more resonance stabilized.

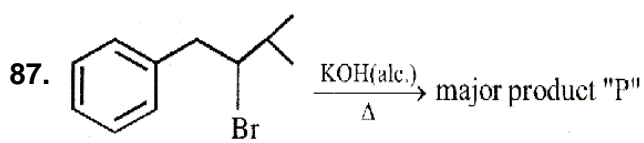
- (1) Both statement I and II are correct.
 (2) Both statement I and II are incorrect.
 (3) Statement I is correct but statement II is incorrect.
 (4) Statement II is correct but statement I is incorrect.

84. Match List I with List II.

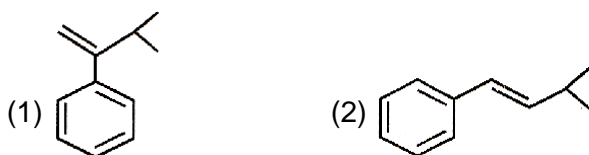


- (1) A-(s), B-(p), C-(r), D-(q)
 (2) A-(q), B-(r), C-(p), D-(s)
 (3) A-(q), B-(p), C-(r), D-(s)
 (4) A-(s), B-(r), C-(p), D-(q)

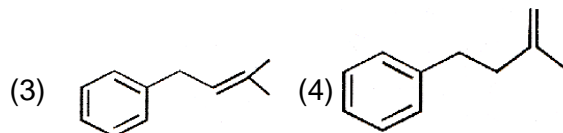
85. The major organic product in the reaction,
 $\text{CH}_3 - \text{O} - \text{CH}(\text{CH}_3)_2 + \text{HI} \rightarrow$ Product is
 (1) $\text{ICH}_2\text{OCH}(\text{CH}_3)_2$
 (2) $\text{CH}_3\text{OC}(\text{CH}_3)_2$
 (3) $\text{CH}_3\text{I} + (\text{CH}_3)_2\text{CHOH}$
 (4) $\text{CH}_3\text{OH} + (\text{CH}_3)_2\text{CHI}$
86. **Assertion:** Synthesis of diethyl ether may be achieved by Williamson synthesis.
Reason: Bromobenzene does not undergo S_N reactions.
- (1) If both Assertion and Reason are correct and the Reason is a correct explanation of the Assertion.
 (2) If both Assertion and Reason are correct but Reason is not a correct explanation of the Assertion.
 (3) If the Assertion is correct but Reason is incorrect.
 (4) If the Assertion is incorrect and Reason is correct.

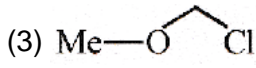
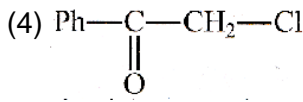


Product P is



91. If the length of a DNA molecule is 1.1 metres, what will be the approximate number of base pairs?
 (1) 3.3×10^9 bp (2) 6.6×10^9 bp
 (3) 3.3×10^6 bp (4) 6.6×10^6 bp
92. In the polynucleotide chain of DNA, a nitrogenous base is linked to the $-\text{OH}$ of
 (1) 2' C pentose sugar
 (2) 3' C pentose sugar
 (3) 5' C pentose sugar
 (4) 1' C pentose sugar
93. Which scientist experimentally proved that DNA is the sole genetic material in bacteriophages?



88. Which of the following is most reactive toward $\text{S}_\text{N}2$ reaction?
 (1) $\text{CH}_2 = \text{CH} - \text{CH}_2 - \text{Cl}$
 (2) $\text{Ph} - \text{CH}_2 - \text{Cl}$
 (3) 
 (4) 
89. When phenyl magnesium bromide reacts with *tert*-butanol, the product would be
 (1) benzene
 (2) phenol
 (3) *ter*-butylbenzene
 (4) *ter*-butyl phenyl ether
90. **Statement I:** Aryl halides undergo nucleophilic substitution with ease.
Statement II: Carbon-halogen bond in aryl halides do not have partial double bond character.
- (1) Both statement I and II are correct.
 (2) Both statement I and II are incorrect.
 (3) Statement I is correct but statement II is incorrect.
 (4) Statement II is correct but statement I is incorrect.

BOTANY

- (1) Beadle and Tatum
 (2) Meselson and Stahl
 (3) Hershey and Chase
 (4) Jacob and Monod
94. Hershey and Chase used radioactive ^{35}S and ^{32}P in experiments to provide evidence that DNA was the genetic material. These experiments pointed out that DNA because
 (1) progeny viruses retained ^{32}P but not ^{35}S
 (2) retention of ^{32}P in progeny viruses indicated that DNA was passed on
 (3) loss of ^{35}S in progeny viruses indicated that proteins were not passed on
 (4) All of the above

- 95.** Complete the flow chart on central dogma
- (1) (a) Replication; (b) Transcription; (c) Transduction; (d) Protein
- (2) (a) Translation; (b) Replication; (c) Transcription; (d) Transduction
- (3) (a) Replication; (b) Transcription; (c) Translation; (d) Protein
- (d) (a) Transduction; (b) Translation; (c) Replication; (d) Protein
- 96.** Which of the following nucleic acids is present in an organism having 70S ribosome only?
- (1) Single-stranded DNA with protein coat
- (2) Double-stranded circular naked DNA
- (3) Double-stranded DNA enclosed in nuclear membrane
- (4) Double-stranded circular DNA with histone proteins
- 97.** Which one is correct
- (1) Complementary base pairing facilitates the DNA replication but not the process of transcription.
- (2) Complementary base pairing facilitates the Process of transcription but not the DNA replication.
- (3) Neither DNA replication nor transcription follows base pairing rule.
- (4) DNA replication, transcription follow the principle of complementary base pairing.
- 98.** Heterochromatin –
- (i) Is more densely packed
- (ii) It stains dark
- (iii) Is transcriptionally active
- (iv) Is transcriptionally inactive
- (1) (i) and (iii) only
- (2) (i), (ii), (iii) and (iv)
- (3) (ii), (iii) and (iv) only
- (4) (i), (ii) and (iv) only
- 99.** DNA
- (i) acts as genetic material in all cellular organisms
- (ii) Was discovered by F. Miescher who named it as 'Nuclein'

- (iii) Is acidic in nature
- (iv) Cannot be digested by DNase
- (1) (i) and (iii) only
- (2) (i), (ii), (iii) and (iv)
- (3) (ii), (iii) and (iv) only
- (4) (i), (ii) and (iii) only

100. In 1953 J. Watson and F. Crick proposed Double helix model of DNA and got Nobel Prize. Their model of DNA was based on–

- (i) X-ray diffraction of DNA produced by M. Wilkins and R. Franklin
- (ii) Griffith's experiment
- (iii) Hershey - Chase experiment
- (iv) Chargaff's rule of base equivalence
- $$(A + G / T + C = 1)$$

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

101. Euchromatin is-

- (i) loosely packed
- (ii) Stains light
- (iii) Transcriptionally active
- (iv) Found in chromosomes
- (1) (i) and (iv) only
- (2) (i), (ii), (iii) and (iv)
- (3) (ii), (iii) and (iv) only
- (4) (i), (ii) and (iii) only

102. Which one / ones did not affect the transformation?

- | | |
|-----------------|-------------|
| (i) DNase | (ii) RNase |
| (iii) Peptidase | (iv) Lipase |
- (1) (i) and (iii) only (2) (i), (ii), (iii) and (iv)
- (3) (ii), (iii) and (iv) only (4) (i), (ii) and (iii) only

103. Match the following:

Column I

- A. Fredrick Griffith
- B. Gamow

- C. Watson and Crick
- D. Meselson and Stahl

Column II

- (i) A sequence of three nucleotides codes for single amino acid
- (ii) Double helical structures
- (iii) Phenomenon of transformation
- (iv) Semiconservative replication of DNA

- (1) A(iii); B- (i); C - (ii); D - (iv)
- (2) A(i); B (iii); C - (iv); D - (ii)
- (3) A(i); B (ii); C - (iii); D - (iv)
- (4) A(iii); B- (i); C - (iv); D - (ii)

104. Evidence indicating the DNA replication was semiconservative came from

- (1) DNA staining techniques
- (2) DNA sequencing
- (3) density gradient studies using "heavy" nucleotides
- (4) none of the above

105. E. coli has only 4.6×10^6 base pairs and completes the process of replication within 18 minutes, then the average rate of polymerization is approximately

- (1) 2000 bp/s
- (2) 3000 bp/s
- (3) 4000 bp/s
- (4) 1000 bp/s

106. Ten E. coli cells with ^{15}N DNA are incubated in medium containing ^{14}N nucleotide. After 60 minutes, how many E. coli cells will have DNA totally free from ^{15}N ?

- (1) 20 cells
- (2) 40 cells
- (3) 60 cells
- (4) 80 cells

107. Which one / ones is/are false for DNA replication?

- (1) Ori is a definite region in DNA where replication starts
- (2) Deoxyribonucleoside triphosphates (dNTPs) serve as substrates as well as source of energy for polymerization.
- (3) Both leading and lagging strands are synthesized in $3' \rightarrow 5'$ direction.
- (4) Replication of DNA is responsible for continuity of life on earth.

108. Choose the correct option.

- (1) Okazaki fragments are formed in $5' \rightarrow 3'$ direction.
- (2) Gene produces sugar.
- (3) $3'$ end of a nucleic acid has phosphate.
- (4) HIV follows central dogma.

109. Statement I: Watson and Crick provided experimental proof of semi-conservative nature of DNA replication.

Statement II: DNA polymerase binds nucleotides in replication.

- (1) Both statement I and II are true.
- (2) Both statement I and II are false.
- (3) Statement I is true but statement II is false.
- (4) Statement I is false but statement II is true.

110. Assertion A: RNA is best material for transmission of genetic information.

Reason R: RNA can directly code for synthesis of proteins.

- (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.

111. Assertion A: Essential life processes evolved around RNA.

Reason R: Beside genetic material RNA also act as catalyst.

- (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.

112. Once transcribed, eukaryotic mRNA typically undergoes substantial alteration that includes

- (1) union with ribosome
- (2) fusion into circular forms known as plasmids.
- (3) linkage to histone molecules.
- (4) excision of introns.

113. What initiation and termination factors are involved in transcription in eukaryotes?

- (1) s and r, respectively
- (2) a and b, respectively
- (3) b and g, respectively
- (4) a and s, respectively

114. What will be the sequence of mRNA produced by the following stretch of DNA?

3'ATCGATGCATGCATC5'

TEMPLATE STRAND

5'TACGTACGTACGTAC3'

CODING STRAND

- (1) 3' AUGCAUGCAUGCAUG 5'
- (2) 5' UACFUACGUACGUAC 3'
- (3) 3'-UACGUACGUACGUAC 5'
- (4) 5'-AUGCAUGCAUGCAUG 3'

115. A mutation in which of the following parts of a gene is likely to be most damaging to a cell?

- (1) intron
- (2) exon
- (3) 5'UTR
- (4) 3'UTR

116. In the process of transcription in Eukaryotes, the RNA polymerase I transcribes

- (1) Precursor of mRNA, hnRNA
- (2) mRNA with additional processing, capping and tailing
- (3) tRNA, 5 srRNA and snRNAS
- (4) rRNAs-28S, 18S and 5.8S

117. When does translation begin in prokaryotic cells?

- (1) as soon as the transcription has begun.
- (2) after a transcription initiation complex has been formed.
- (3) after the 5' caps are converted to mRNA.
- (4) Double-stranded circular DNA with histone proteins

118. All are incorrect except

- (1) A transcript is often shorter than the final RNA molecule that leaves nucleus.
- (2) During RNA processing exons are excised and enzymatically hydrolysed.

(3) A codon may code for the same amino acid as some another codon does.

(4) DNA is directly involved translation.

119. **Statement I:** UAG codon is a termination codon.

Statement II: If in mRNA, a termination codon is present, the protein synthesis stops.

- (1) Both statement I and II are true.
- (2) Both statement I and II are false.
- (3) Statement I is true but statement II is false.
- (4) Statement I is false but statement II is true.

120. **Statement I:** DNA is not transcribed in the synthesis of messenger RNA.

Statement II: mRNA does code for proteins.

- (1) Both statement I and II are true.
- (2) Both statement I and II are false.
- (3) Statement I is true but statement II is false.
- (4) Statement I is false but statement II is true.

121. **Statement I:** Polycistronic mRNA is commonly found in eukaryotes.

Statement II: mRNA is polycistronic as it specifies mul-tiple prokaryotes.

- (1) Both statement I and II are true.
- (2) Both statement I and II are false.
- (3) Statement I is true but statement II is false.
- (4) Statement I is false but statement II is true.

122. **Assertion A:** RNA viruses having shorter life span and evolves faster.

Reason R: In RNA rate of mutations is slower than DNA.

- (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.

123. Match the Columns:

Column-I

A. DNA polymerase

- B. RNA polymerase
- C. Reverse transcriptase
- D. RNA polymerase II

Column-II

- (i) DNA dependent RNA polymerase
- (ii) 5 SrRNA
- (iii) RNA dependent DNA polymerase
- (iv) DNA dependent DNA polymerase
- (1) A(i), B(iv), C (iii), D(ii)
- (2) A(iv), B(i), C (ii), D(iii)
- (3) A(iii), B (ii), C -(i), D - (iv)
- (4) A-(iv), B(i), C (iii), D - (ii)

124. Match the column I with column II and choose the correct option.

Column I

- A. RNA polymerase I
- B. RNA polymerase II
- C. RNA polymerase III
- D. DNA polymerase III

Column II

- (i) Joining of nucleotides
- (ii) rRNAs
- (iii) hnRNA
- (iv) tRNA
- (1) A - (ii); B - (i); C - (iii); D - (iv)
- (2) A - (ii); B - (i); C - (iv); D- (iii)
- (3) A - (iv); B - (iii); C - (i); D - (ii)
- (4) A - (ii); B - (iii); C - (iv); D - (i)

125. The process of translation of mRNA to proteins begins as soon as:

- (1) The small subunit of ribosome encounters mRNA
- (2) The larger subunit of ribosome encounters mRNA
- (3) Both the subunits join together to bind with mRNA
- (4) The tRNA is activated and the larger subunit of ribosome encounters mRNA

126. Statement I: In eukaryotes, replication and transcription occur in the nucleus but

translation occurs in the cytoplasm.

Statement II: mRNA is transferred from the nucleus into the cytoplasm where ribosomes and amino acids are available for protein synthesis.

- (1) Both statement I and II are true.
- (2) Both statement I and II are false.
- (3) Statement I is true but statement II is false.
- (4) Statement I is false but statement II is true.

127. Match the column:

Column-I

- A. *y*-gene
- B. *z*-gene
- C. *a*-gene
- D. *i*-gene

Column-II

- (i) β -galactosidase
- (ii) Permease
- (iii) Repressor protein
- (iv) Transacetylase

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

128. Match the column I with column II and choose the correct option.

Column I

- A. Splicing
- B. Okazaki fragments
- C. Jacob and Monad
- D. Inducer

Column II

- (i) Lac operon
- (ii) Lagging strands
- (iii) Lactose
- (iv) Removals of intron
- (1) A (iv); B (ii); C (i); D (iii)
- (2) A (ii); B- (i); C (iv); D (iii)
- (3) A (iv); B (iii); C (i); D (ii)
- (4) A (ii); B (iii); C (i); D (iv)

129. Match the enzymes given in column -I with its function given in column -II and select the correct option.

Column-I

- A. B-galactosidase
- B. Permease

- C. Ligase
- D. Ribozyme

Column-II

- (i) Joining of DNA fragments
- (ii) Peptide bond formation
- (iii) Hydrolysis of lactose
- (iv) Increase permeability of B-galactosidase

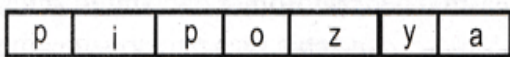
- (1) A (ii); B (i); C (iv); D (iii)
- (2) A (iii); B (iv); C (i); D (ii)
- (3) A (ii); B (iv); C (i); D (iii)
- (4) A (i); B (ii); C (iv); D (iii)

130. Match the column-I with column-II and choose the correct combination from the given options.

	Column-I		Column-II
A.	Operator site	(i)	Binding site for RNA polymerase
B.	Promoter site	(ii)	Binding site for repressor molecule
C.	Structural gene	(iii)	Codes for enzyme protein
D.	Regulator gene	(iv)	Codes for repressor molecules

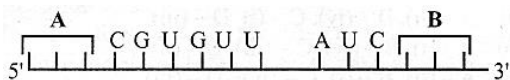
- (1) A (ii); B (i); C (iii); D (iv)
- (2) A (ii); B (i); C (iv); D (iii)
- (3) A (iv); B (iii); C (i); D (ii)
- (4) A (ii); B (iii); C (i); D (iv)

131. In the Diagram given figure of Lac operon



- (1) i-Repressor, z- β-galactosidase, y- Permease, a-Transacetylase
- (2) i- Inhibitor, z- Repressor, y- Transacetylase, a- Permease
- (3) i-Inducer, z- β-galactosidase, y- Permease, a- Repressor
- (4) i-β-galactosidase, z- Repressor, y- Permease, a- Transacetylase

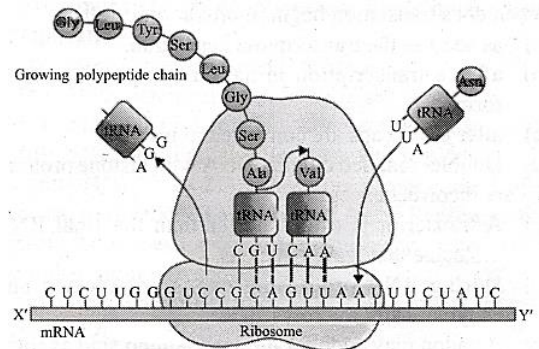
132. Refer to the given mRNA segment which can be translated completely into a polypeptide.



Which of the following codons may correspond with A and B?

- (1) A-AUG, B - UAA, UAG or UGA
- (2) A-UAA, B - AUG, GUG or UAG
- (3) A-AUG, B - GUG, UAA or UGA
- (4) A-AUG, BUAA, UUU or UGA

133. Refer to the given figure.



Select the option which identifies polarity X and Y.

- | | | |
|-----|----|----|
| | X | Y |
| (1) | 3' | 5' |
| (2) | 5' | 3' |
| (3) | 3' | 5' |
| (4) | 5' | 3' |

134. Which is the basis of genetic mapping of human genome as well as DNA finger printing?

- (1) Polymorphism in DNA sequence
- (2) Single nucleotide polymorphism
- (3) Polymorphism in hnRNA sequence
- (4) Polymorphism in RNA sequence

135. Which of the following statements is correct about Human Genome Project –

- (1) To develop ways of mapping the human genome at increasing fine level of precision.
- (2) To store this information in databases and develop tools for data analysis.
- (3) To address the ethical, legal and social issues that may arise from this project.
- (4) All of the above

ZOOLOGY

136. Which of the following is/are incorrect about Neanderthal man?

[NCERT Page 125]

- A. had large brain around 900 c.c
- B. lived in near east and central Asia between 1,00,000 - 40,000 years back
- C used hides to protect their body and buried their dead.
- D. arose in Africa.

Choose the correct answer from the options given below:

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

137. From his experiments, SL Miller produced amino acids by mixing the following in a closed flask.

- (1) CH₃H₂, NH₄ and water vapour at 800°C
- (2) CH₄, H₂, NH₃, and water vapour at 600°C
- (3) CH₃, H₂, NH₃, and water vapour at 600°C
- (4) CH₄, H₂, NH₃, and water vapour at 800°C

138. Match column I with column II and select the correct option from the given codes

	Column I		Column II
A	Big Bang theory	(i)	Spore
B.	Formation of life was proceeded by chemical evolution	(ii)	Louis Pasteur
C.	Theory of panspermia	(iii)	Original universe
D.	Life comes from pre-existing life	(iv)	Oparin and Haldane

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

139. What is true regarding industrialization in England

- (1) The white-winged moths were completely wiped out after industrialization
- (2) Since lichens did not grow in polluted area,

the number of melanized moths get reduced

(3) After industrialization the white-winged moths did not survive due to predators

(4) All of these

140. What did Miller use as a source of energy in his experiment? **[NCERT Page 111]**

- (1) actual lightning (2) UV light
- (3) an electrical spark (4) radioactivity

141. From the statements given below choose the correct option: **[NCERT Page 113]**

- A. Fossils are remains of soft parts of life forms in Rock.
- B. A study of fossils in different sedimentary layers indicates the geological period in which they live.
- C. Fossils represents live organisms.
- D. Study of fossils is called palaeontology.
- E. The study showed that life-forms varied over time and certain life forms are restricted to certain geological time-spans.

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

142. The excess use of herbicides and pesticides etc. has resulted in selection of resistant varieties in a much lesser time. Hence, resistant organisms/cells are appearing in a time span of months or years and not centuries. This statement is

- (1) In favour of evolution by anthropogenic action
- (2) Against the natural selection theory
- (3) In favour of sexual selection theory
- (4) In favour of genetic drift.

143. Industrial melanism is related to

[NCERT Page 116]

- (1) Skin darkening due to smoke
- (2) Drug resistance
- (3) Defence against UV radiations
- (4) Protective resemblance to surroundings

144. From the statements given below choose the correct option: **[NCERT Page 117, 118]**

- A. Homologous structures show convergent evolution.
- B. Darwin's finches represents one of the best examples of adaptive radiation.
- C. Fitness is the end result of the ability to adapt and get selected by nature.
- D. Branching descent and natural selection are the two key concepts of Darwinian Theory of Evolution.

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

145. According to Hugo de Vries, the mechanism of evolution is

- (1) Phenotypic variations
- (2) Saltation
- (3) Multiple step mutations
- (4) Minor mutations

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

Assertion (A): Whales, bats, cheetah and human share similarities in the pattern of bones of forelimb.

Reason (R): They follow divergent evolution.

[NCERT Page 115]

In the light of the above statements, choose the correct answer from the options given below:

- (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.

147. Which of the following explained evolution in most acceptable form?

- (1) Lamarck, Darwin, Hugo de Vries
- (2) Anaximander, Darwin, Malthus
- (3) F. Redi, Richter, Cuvier
- (4) Lamarck, Hardy Weinberg, Darwin

148. Match List-I with List-II.

[NCERT Page 111, 113, 115]

List-I

- A. Ernst Heckel
- B. Oparin and Haldane
- C. Miller
- D. Analogous organs

List-II

- I. Chemical evolution
- II. Experimental proof of chemical evolution
- III. Wings of bird and butterfly
- IV. Embryological support for evolution

Choose the correct answer from the options given below:

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

149. Which of the following phenomenon cannot be explained by the theory of natural selection?

- (1) Industrial melanism
- (2) Resistance to pesticides and antibiotics
- (3) Sickle cell anaemia
- (4) Founder's effect

150. The biologist popularly known as 'Darwin of 20th century' was

- (1) Ernst Mayr
- (2) Linnaeus
- (3) Diener
- (4) Whittaker

151. **Statement I:** Homology is explained by idea of branching descent.

Statement II: Branching descent and natural selection are 2 key concepts of Darwinism.

- (1) Both statement I and II are true.
- (2) Both statement I and II are false.
- (3) Statement I is true but statement II is false.
- (4) Statement I is false but statement II is true.

152. Read the following statements:

- (i) Diversifying (disruption) selection is a mode of

natural selection that favours variants of opposite extremes over intermediate forms

(ii) In the evolution of life on Earth, the early primitive cells that were present must have obtained their energy by glycolysis and fermentation

(iii) Darwin's theory of evolution was highly influenced by the Mendel's crossing experiments with peas

(iv) Hardy-Weinberg's principle can be used to interpret whether evolution has occurred in a population or not

(v) Hugo de Vries gave the concept of saltation.

Which of the above statements are correct?

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

153. Choose the correctly match pair about human evolution. **[NCERT Page 124]**

- (1) *Homo habilis*-650-800cc
- (2) *Homo erectus* - 1400cc
- (3) *Neanderthal man* - 900cc
- (4) *Homo Sapiens* - 800cc

154. Find out which of the following statements are true(T)/false(F) and choose the correct option?

- (i) Genetic drift is a random change in gene frequency
- (ii) Gene pool of a population tends to remain stable if the population is large, without large scale mutations, without migration and with random mating
- (iii) Genetic drift can disrupt Hardy-Weinberg Equilibrium.
- (iv) Saltation on refers to single step large mutation.

- (1) (i)-T, (ii)-T, (iii)-T, (iv)-T
- (2) (i)-F, (ii)-T, (iii)-T, (iv)-T
- (3) (i)-T, (ii)-F, (iii)-T, (iv)-F
- (4) (i)-F, (ii)-F, (iii)-T, (iv)-F

155. Match List-I with List-II. **[NCERT Page 111]**

List-I

- A. Universe
- B. Earth
- C. Life
- D. First non-cellular life forms

List-II

- I. 4.5 billion years old
- II. 20 billion years old
- III. 500 million years after the formation of Earth
- IV. 3 billion years back

Choose the correct answer from the options given below:

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

156. Assertion A: Evolution is not a directed process in the sense of determinism.

Reason R: Evolution is a stochastic process based on chance events in nature and chance mutation in the organism

- (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.

157. Match the name of scientists listed under column I with the ideas listed under column II.

	Column I		Column II
A.	Darwin	(i)	Saltation
B.	De Vries	(ii)	Genetic equilibrium
C.	Weinberg	(iii)	Speciation
D.	Founder effect	(iv)	Evolution by natural selection

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

158. Choose the wrong pair **[NCERT Page 115]**

- (1) Divergent evolution- Fore limbs of whales, cheetah and human
- (2) Convergent evolution- Flippers of penguins and dolphins

(3) Homologous structures-Vertebrate hearts

(4) Analogous structures-Tendrils of Bougainvillea and Cucurbita

159. Match column I (containing list of scientists) with column II (their contributions) and choose the correct option.

	Column I		Column II
A.	Charles Darwin	(i)	Mutation theory
B.	Lamarck	(ii)	Use and disuse of organs
C.	Hugo de Vries	(iii)	Natural selection
D.	Hardy Weinberg	(iv)	Genetic equilibrium

(1) A-(iii); B – (ii); C - (i); D – (iv)

(2) A-(iii); B – (ii); C - (iv); D – (i)

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

(4) A-(iv); B – (ii); C - (i); D - (iii)

160. Match the evolution concepts given in column-I with column-II and select the correct answer.

	Column I		Column II
A.	Mutation	(i)	Change in population's allele frequencies due to chance alone.
B.	Gene migration	(ii)	Differences in survival and reproduction among variant individuals
C.	Genetic recombination	(iii)	Immigration, emigration change allele frequencies.
D.	Genetic drift	(iv)	Random and directionless

(1) A-(i); B- (ii); C - (iii); D – (iv)

(2) A-(iv); B – (ii); C - (iii); D – (i)

(3) A-(iii); B - (i); C - (iv); D – (ii)

(4) A-(iv); B – (iii); C - (ii); D - (i)

161. Australia has unusual organisms because their evolution for the past 38 million years has been

(1) Rapid

(2) Slow

(3) Isolated from other organisms

(4) Punctuated

162. What are the key concepts of Darwin's theory of evolution? [NCERT Page 119]

(1) Natural selection

(2) Cloning

(3) Mutation

(4) Asexual reproduction

163. Select the correct statement(s).

(1) Single-celled organisms evolved slowly into multicellular organisms

(2) Dinosaurs disappeared around 65 million years ago

(3) Jawless fish must have evolved around 350 million years ago.

(4) All of the above

164. **Statement I:** Coal is a type of fossil-fuel.

Statement II: Giant ferns and some other plants fell down.

(1) Both statement I and II are true.

(2) Both statement I and II are false.

(3) Statement I is true but statement II is false.

(4) Statement I is false but statement II is true.

165. Similarities in proteins and genes performing a given function among diverse organisms give clues to Complete the above statement by using correct option [NCERT Page 115]

(1) Different ancestry

(2) Analogous organs.

(3) Convergent evolution

(4) Common ancestry

166. If 64% of the individuals in a population are homozygous recessive for a character then calculate the percentage of heterozygous individuals in this population

[New NCERT P. 121]

(1) 36%

(2) 0.04%

(3) 0.8%

(4) 32%

167. **Statement I:** Mammals resembling horse, hippopotamus, bear, rabbit were common in South America.

Statement II: Due to continental drift, when South America joined North America, these animals were over ridden by North American

fauna.

- (1) Both statement I and II are true.
- (2) Both statement I and II are false.
- (3) Statement I is true but statement II is false.
- (4) Statement I is false but statement II is true.

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

Assertion (A): Darwin's finches are best example of adaptive radiation.

Reason (R): There were many varieties of finches on Galapagos island and all varieties evolved from the original seed eating variety, many other forms with altered beak arose.

In the light of the above statements, choose the correct answer from the options given below:

[NCERT Page 117]

- (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.

169. Mammals occur on land, air and water. It is:

- (1) Adaptive radiation
- (2) Microevolution
- (3) Convergent evolution
- (4) Adaptation

170. *Homo erectus* -

- (i) had a large brain around 900 c. c.
 - (ii) probably ate meat.
 - (iii) appeared about 1.5 mya year ago
 - (iv) evolved from *H. habilis*.
- (1) (i) and (ii) only
 - (2) (i), (ii) and (iii) only
 - (3) (iii) and (iv) only
 - (4) All

171. Assertion A: The amphibian evolved into reptiles.

Reason R: Reptiles lay thick shelled eggs

which do not dry up in sun like those of amphibians.

- (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.

172. Identify the statement that is NOT correct.

[NCERT Page 115]

- (1) The eyes of the octopus and of mammals or the flippers of Penguins and of Dolphins are examples of analogous organs.
- (2) Analogous organs perform similar functions.
- (3) Analogous organs are a result of convergent evolution.
- (4) Analogous organs are anatomically similar structures.

173. Statement I: The primitive atmosphere was reducing one i.e.; without oxygen.

Statement II: In the primitive atmosphere, oxygen was involved in the formation of ozone layer.

- (1) Both statement I and II are true.
- (2) Both statement I and II are false.
- (3) Statement I is true but statement II is false.
- (4) Statement I is false but statement II is true.

174. When the same structures develop along different directions due to adaptation to different needs, this is called: [NCERT Page 114]

- (1) Convergent evolution
- (2) Divergent evolution
- (3) Adaptive radiation
- (4) Adaptive convergence

175. From the statements given below choose the correct option: [NCERT Page 122, 124]

- A. By the time of 500 mya, invertebrates were formed and active.
- B. Jawless fish probably evolved around 350 mya.
- C. Sea weeds and few plants existed probably around 320 mya.

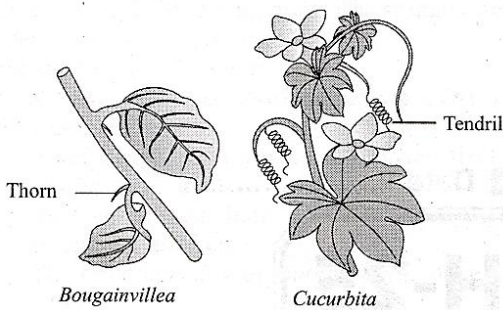
- D. About 100 mya, the dinosaurs suddenly disappeared from the earth.
- E. The first mammals were like rats sized.

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

176. The process of evolution of different species in a given geographical area starting from a point and literally radiating to the other habitats is called **[NCERT Page 116]**

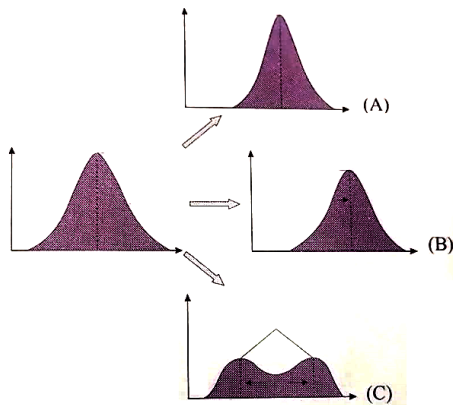
- (1) Convergent evolution
 (2) Transformation
 (3) Adaptation
 (4) Adaptive radiation

177. The given figure shows an example of



- (1) homologous organs
 (2) convergent evolution
 (3) divergent evolution
 (4) both (1) and (3)

178. Refer to the given figure (A), (B) and (C). Identify the statements that are correctly matched with their figures. **[NCERT Page 120]**



- I Peak get higher and narrower. - (C)
 II. Peak shifts in one direction. - (B)
 III. Two peaks form. - (C)
 IV. Peak gets lower and broader. - (A)

Choose the correct answer from the options given below:

- (1) I and II only (2) II and III only
 (3) I and IV only (4) II, III and IV only

179. Match Column-I with Column-II and select the correct option.

	Column-I		Column-II
A.	Wallace	(i)	Influenced Darwin
B.	Malthus	(ii)	Industrial melanism
C.	Hardy-Weinberg law	(iii)	$p^2 + q^2 + 2pq = 1$
D.	Natural selection	(iv)	Co-proposer of Natural selection

- (1) A-(iii); B- (iv); C - (ii); D - (i)
 (2) A-(ii); B- (i); C- (iv); D - (iii)
 (3) A-(iv); B- (i); C - (ii); D - (iii)
 (4) A-(iv); B- (i); C - (iii); D - (ii)

180. Speciation [New NCERT P. 121]

- (1) Is the formation of new species
 (2) May be caused by mutation
 (3) Both (1) and (2)
 (4) The degeneration of one or more species

