

**TOPIC :**

**Physics** : *EMI (Self induction, Mutual induction, Growth of a current LR circuit)*

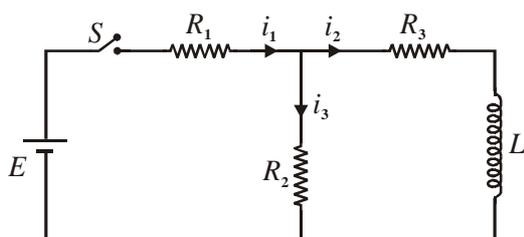
**Chemistry** : *Carboxylic acid derivatives, amines preparation*

**Botany** : *Tools / vectors for genetic manipulation, Recombinant DNA technology ; Genome, Human genome project, Gene library, Gene bank; DNA fingerprinting, Cloning*

**Zoology** : *Modern Evolutionary Theory – II (Natural selection, Genetic Drift)*

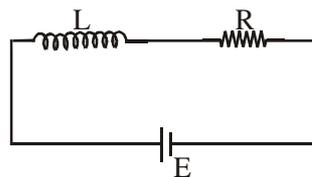
# PHYSICS

1. In the circuit shown in the adjoining diagram  $E = 10$  volts,  $R_1 = 2$  ohms,  $R_2 = 3$  ohms,  $R_3 = 6$  ohms and  $L = 5$  Henry. The current  $i_1$  just after pressing the switch  $S$  is



- (1)  $\frac{10}{4}$  amp                      (2)  $\frac{10}{5}$  amp  
 (3)  $\frac{10}{12}$  amp                      (4)  $\frac{10}{6}$  amp
2. Self inductance of a coil is independent of  
 (1) current flowing in the coil  
 (2) emf induced in the coil  
 (3) rate of change of current in the coil  
 (4) All of these
3. A small circular loop of radius  $r$  is placed inside a circular loop of radius  $R$  ( $R \gg r$ ). The loops are coplanar and concentric. The mutual inductance of the system is proportional to  
 (1)  $\frac{r}{R}$                               (2)  $\frac{r^2}{R}$   
 (3)  $\frac{r}{R^2}$                               (4)  $\frac{r^2}{R^2}$
4. A coil has an inductance of 5 henrys and a resistance of 20 ohms. If a 100 volt emf is applied, what energy stored in the magnetic field after the current has built up to maximum current is given by  
 (1) 63 joules                      (2) 83 joules  
 (3) 50 joules                      (4) none of these
5. The current in a solenoid of 240 turns, having a length of 12 cm and a radius of 2 cm, changes at a rate of 0.8 A/s. The emf induced in it is  
 (1)  $8 \times 10^{-6}$  V                      (2)  $6 \times 10^{-6}$  V  
 (3)  $3 \times 10^{-6}$  V                      (4)  $10^{-6}$  V
6. If the linear dimensions of the core of a cylindrical coil are doubled, the inductance of the coil will be (assuming complete winding over the core)

- (1) Doubled                      (2) Four fold  
 (3) Eight times                      (4) Remains unchanged
7. Shown in the figure is an R-L circuit. Just after the key (K) is closed

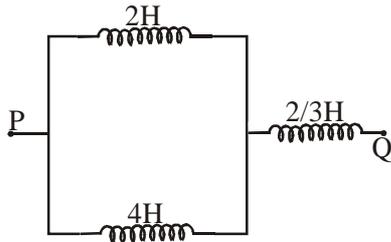


- (1) The current in the circuit is zero  
 (2) No potential drop across the resistor  
 (3) Potential drops across the inductor is E  
 (4) All of above
8. A solenoid of length 20 cm, area of cross-section  $4.0 \text{ cm}^2$  and having 4000 turns is placed inside another solenoid of 2000 turns having a cross sectional area  $8.0 \text{ cm}^2$  and length 10 cm. The mutual inductance between the solenoids is  
 (1)  $3 \times 10^{-2}$  H                      (2) 20 mH  
 (3) 30 mH                      (4) 40 mH
9. A magnetic flux of  $9 \times 10^{-4}$  weber is linked with each turn of a 200 turn coil when there is an electric current of 3 A in it. The self inductance of the coil is  
 (1)  $3 \times 10^{-2}$  H                      (2)  $6 \times 10^{-2}$  H  
 (3)  $4 \times 10^{-2}$  H                      (4)  $10^{-3}$  H
10. An inductor may store energy in  
 (1) Its electric field                      (2) Its coil  
 (3) Its magnetic field  
 (4) Both its electric and magnetic fields
11. The mutual inductance of an induction coil is 5 H. In the primary coil, the current reduces from 5 A to zero in  $10^{-3}$  sec. What is the induced e.m.f. in the secondary coil?  
 (1) 2500 V                      (2) 25000 V  
 (3) 2510 V                      (4) Zero
12. The current passing through a choke coil inductor of 5 Henry is decreasing at the rate of 2 amp/sec. The e.m.f. developed across the coil is  
 (1) 10 volts                      (2) -10 volts  
 (3) 2.5 volts                      (4) -2.5 volts
13. When two inductors  $L_1$  and  $L_2$  are connected in parallel, the equivalent inductance  
 (1) Is  $L_1 + L_2$                       (2) Lies between  $L_1$  and  $L_2$   
 (3) Is less than both  $L_1$  and  $L_2$   
 (4) None of the above is true

14. A magnetic flux of  $9 \times 10^{-4}$  weber is linked with each turn of a 200 turn coil when there is an electric current of 3 A in it. The self inductance of the coil is

- (1)  $3 \times 10^{-2}$  H                      (2)  $6 \times 10^{-2}$  H  
 (3)  $4 \times 10^{-2}$  H                      (4)  $10^{-3}$  H

15. The equivalent inductance between points P and Q in figure is



- (1) 2 H                                      (2) 6 H  
 (3)  $8/3$  H                                (4)  $4/9$  H

16. Two solenoid A and B have same area of cross-section. The ratio of lengths of two is 1 : 2 and the ratio of number of turns is 2 : 1. Find the ratio of self inductance of A to that of B

- (1) 2    (2) 4  
 (3) 8    (4) 16

17. When the rate of change of current is unity, induced e.m.f. is equal to

- (1) Thickness of coil  
 (2) Number of turns in coil  
 (3) Coefficient of self-induction  
 (4) Total flux linked with coil

18. An e.m.f. of 5 V is produced in a coil when current in the coil changes at a steady rate from 3 A to 2 A in one millisecond. The value of self inductance is

- (1)  $5 \times 10^2$  H                              (2) 5 H  
 (3)  $5 \times 10^{-3}$  H                            (4) 0.005 mH

19. A 10 henry inductor is carrying a current of 2A. At what rate should the current be changed so that an e.m.f. of 100 V is induced ?

- (1)  $5 \text{As}^{-1}$                                   (2)  $10 \text{As}^{-1}$   
 (3)  $15 \text{As}^{-1}$                                 (4)  $20 \text{As}^{-1}$

20. Two coils X and Y are placed in a circuit such that a current changes by 2 A in coil X and magnetic flux change of 0.4 Wb occurs in Y. The value of mutual inductance of the coils is

- (1) 0.8 H                                      (2) 0.2 Wb  
 (3) 0.2 H                                      (4) 5 H

21. What is the self inductance of an air core solenoid 1m long, diameter 0.05 m, if it has 500 turns. ?

- (1)  $3.15 \times 10^{-4}$  H                      (2)  $4.8 \times 10^{-4}$  H  
 (3)  $5 \times 10^{-4}$  H                          (4)  $6.17 \times 10^{-4}$  H

22. If the linear dimensions of the core of a cylindrical coil are doubled, the inductance of the coil will be (assuming complete winding over the core)

- (1) Doubled  
 (2) Four fold  
 (3) Eight times  
 (4) Remains unchanged

23. A coil of area  $80 \text{ cm}^2$  and 50 turns is rotating with 2000 revolutions per minute about an axis perpendicular to a magnetic field of 0.05 T. The maximum value of the emf developed in it is

- (1)  $200 \pi$  V

(2)  $\frac{10\pi}{3}$  V

(3)  $\frac{4\pi}{3}$  V

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

24. A coil of wire of a certain radius has 600 turns and a self inductance of 108 mH. The self inductance of another similar coil of 500 turns will be

- (1) 74 mH                                      (2) 75 mH  
 (3) 76 mH                                      (4) 77 mH

25. The mutual inductance between two coils is 1.25 henry. If the current in the primary changes at the rate of 80 ampere/second, the induced emf in the secondary is

- (1) 12.5 V                                      (2) 64.0 V  
 (3) 0.016 V  
 (4) 100.0 V

26. An emf of 6 V is induced in a given coil when the current in it changes at the rate of 30 A/min. The self inductance of the coil is

- (1) 0.2 H                                      (2) 5 H  
 (3) 12 H                                        (4) 180 H

27. In a solenoid, if number of turns is doubled, the self inductance will become

- (1) Half                                        (2) Doubled  
 (3) 1/4 times                                (4) Quadrupled

28. Two inductors each of inductance L are joined in parallel. What is their equivalent inductance?

- (1) Zero                                        (2) 2L  
 (3) L/2                                        (4) L

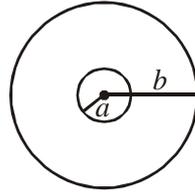
29. Two concentric and coplanar circular coils have radii  $a$  and  $b$  ( $\gg a$ ) as shown in figure. Resistance of the inner coil is  $R$ . Current in the outer coil is increased from 0 to  $i$ , then the total charge circulating the inner coil is

(1)  $\frac{\mu_0 i a^2 \pi}{2Rb}$

(2)  $\frac{\mu_0 i ab}{2R}$

(3)  $\frac{\mu_0 i a \pi b^2}{2a R}$

(4)  $\frac{\mu_0 i ab}{2\pi R}$



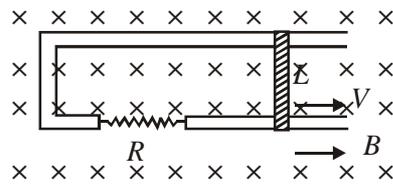
30. A conducting rod of length  $L$  slides at a constant velocity  $V$  on two parallel conducting rails as shown in figure. The mechanical power required to pull the rod at constant velocity is

(1)  $\frac{B^2 L^2 V^2}{R}$

(2)  $\frac{BLV}{R}$

(3)  $\frac{BL^2 V}{R}$

(4)  $\frac{B^2 L^2}{RV^2}$



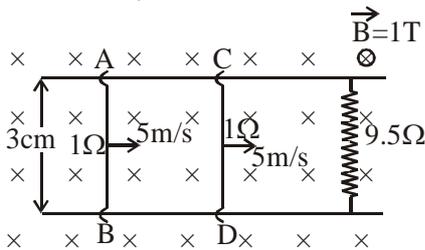
31. Two wires AB and CD are made to slide on the rails with the speed 5 m/s each as shown in figure. The current through  $9.5 \Omega$  resistance is (The resistance of wire AB and CD =  $1 \Omega$ )

(1) 0.015 A

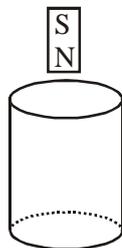
(2) 0.15 A

(3) 0.2 A

(4) 1.5 A

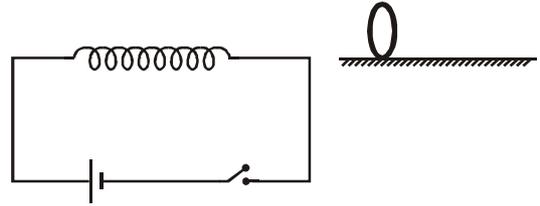


32. When a magnet is released from rest along the axis of a hollow conducting cylinder situated vertically as shown in the figure,



- (1) The direction of induced current in the cylinder is anticlockwise as seen from the above  
 (2) The magnet moves with an acceleration less than  $g = 9.8 \text{ m/sec}^2$   
 (3) The cylinder gets heated  
 (4) All of above

33. Figure shows a horizontal solenoid connected to a battery and a switch. A copper ring is placed on a frictionless track, the axis of the ring being along the axis of the solenoid. As the switch is closed, the ring will



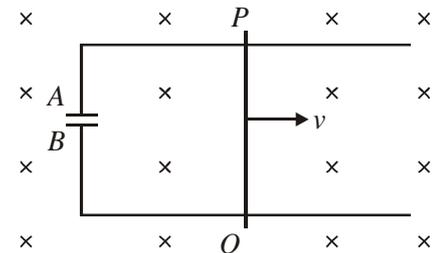
(1) Remain stationary

(2) Move towards the solenoid

(3) Move away from the solenoid

(4) Move towards the solenoid or away from it depending on which terminal (positive or negative) of the battery is connected to the left end of the solenoid

34. A conducting rod  $PQ$  of length  $L = 1.0 \text{ m}$  is moving with a uniform speed  $v = 2 \text{ m/s}$  in a uniform magnetic field  $B = 4.0 \text{ T}$  directed into the paper. A capacitor of capacity  $C = 10 \mu\text{F}$  is connected as shown in figure. Then



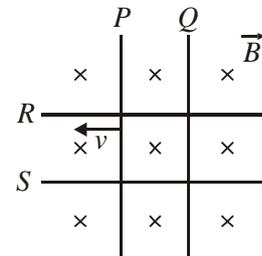
(1)  $q_A = +80 \mu\text{C}$  and  $q_B = -80 \mu\text{C}$

(2)  $q_A = -80 \mu\text{C}$  and  $q_B = +80 \mu\text{C}$

(3)  $q_A = 0 = q_B$

(4) Charge stored in the capacitor increases exponentially with time

35. Two identical conductors  $P$  and  $Q$  are placed on two frictionless rails  $R$  and  $S$  in a uniform magnetic field directed into the plane. If  $P$  is moved in the direction shown in figure with a constant speed then rod  $Q$



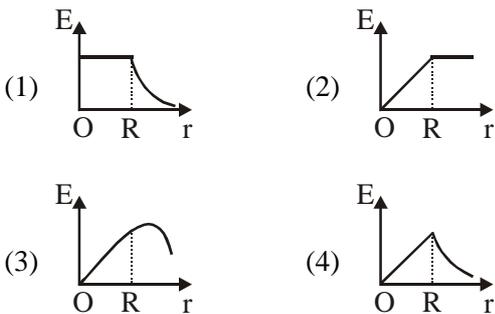
(1) Will be attracted towards  $P$

(2) Will be repelled away from  $P$

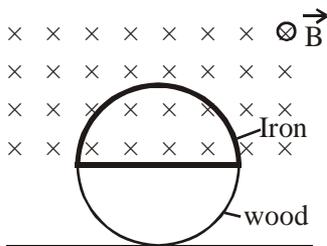
(3) Will remain stationary

(4) May be repelled or attracted towards  $P$

36. A uniform magnetic field is confined in a cylindrical region of radius  $R$ . Induction of magnetic field is increasing at a constant rate  $\frac{dB}{dt} = \alpha$ . Strength of induced electric field ( $E$ ) varies with distance  $r$  from the axis of cylindrical region as

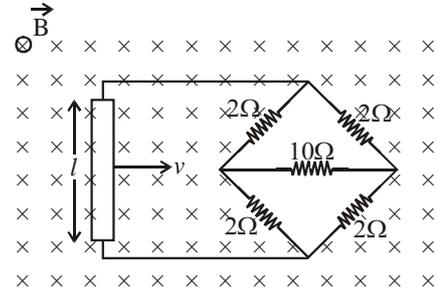


37. The figure shows a circular wheel of radius 10.0 c.m. whose upper half, shown dark in figure, is made of iron and the lower half of wood. The two junctions are joined by an iron rod. A uniform magnetic field  $\vec{B}$  of magnitude  $10^{-3}\text{T}$  exists in space above the central line. The wheel is set into pure rolling on the horizontal surface. If it takes 2s for the iron part to come down and wooden part to go up, the average emf induced during this period is



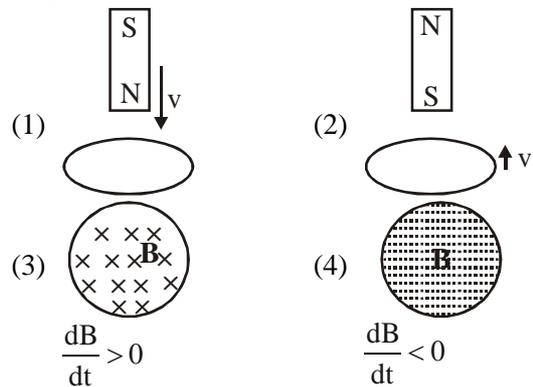
- (1)  $5 \times 10^{-6}\text{ V}$   
 (2)  $3.2 \times 10^{-6}\text{ V}$   
 (3)  $7.8 \times 10^{-6}\text{ V}$       (4)  $9.6 \times 10^{-6}\text{ V}$

38. A rod of length ( $l=1\text{m}$ ) and resistance  $r = 0.5\ \Omega$  are connected to electrical circuit as shown in figure. Resistance of connecting wires are negligible. The rod is moving with velocity  $v = 10\text{ m/s}$  in external magnetic field  $B = 1\text{ tesla}$ . The current through the circuit is

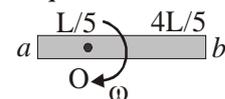


- (1) 4 A clock wise      (2) 3A anticlock wise  
 (3) 4 A anticlock wise      (4) 1 A clock wise

39. Identify in which of the following case, induced current in the ring is clockwise as seen from above perpendicular to its plane

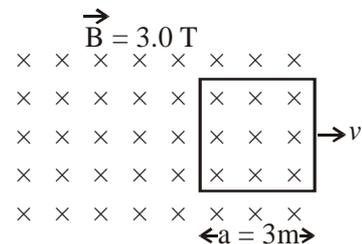


40. A straight rod of length  $L$  is rotating about an axis passing through  $O$  and perpendicular to the plane. In the space a uniform magnetic field  $B$  exists normal to the plane of rotation. Potential difference between  $a$  &  $b$  is equal to



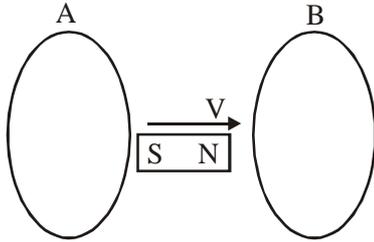
- (1)  $\frac{8}{25}BL^2\omega$       (2)  $\frac{7}{25}BL^2\omega$   
 (3)  $\frac{3}{10}BL^2\omega$       (4) Zero

41. Figure shows loop of 200 turns and side  $a = 3\text{m}$  and resistance  $R = 1000\ \Omega$ . The work done in pulling the loop out of the field, slowly and uniformly in 1.0 s is



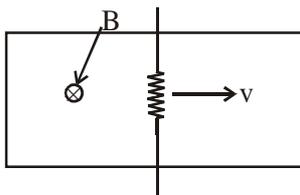
- (1) 130 J      (2) 125 J  
 (3) 146 J      (4) None of these

42.  $A, B$  are two conducting circular loops with their planes parallel and a magnet is moved in between them. Then



- (1) The loops will experience no force upon each other  
 (2) The loops will repel each other  
 (3) The loops will attract each other  
 (4) Both the loops move toward left with velocity  $V$
43. A metal disc of radius  $R$  rotates with an angular velocity  $\omega$  about an axis perpendicular to its plane passing through its centre in a magnetic field of induction  $B$  acting perpendicular to the plane of the disc. The induced e.m.f. between the rim and axis of the disc is
- (1)  $B\pi R^2\omega$                       (2)  $BR^2\omega$   
 (3)  $B\pi R^2\omega/2$                     (4)  $BR^2\omega/2$

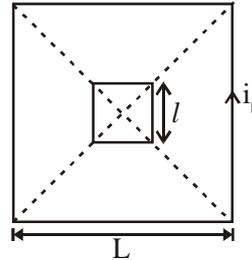
44. A conducting bar pulled with a constant speed  $v$  on a smooth conducting rail. The region has a steady magnetic field of induction  $B$  as shown in the figure. If the speed of the bar is doubled then the rate of heat dissipation will be



- (1) Constant  
 (2) Quarter of the initial value  
 (3) Four fold  
 (4) Doubled
45. Two identical coils when connected in series such that their flux support each other produce an inductance of  $6H$  and when they connected in series such that their flux oppose each other they produce inductance of  $2H$ . The coefficient of coupling is
- (1) 0.25                              (2) 0.5  
 (3) 0.75                              (4) 1
46. Self inductance of coil of length  $l$  and number of turns per unit length  $n$ , will be

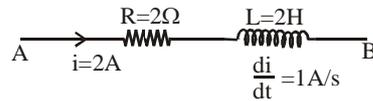
- (1)  $\mu_0 n l A$                               (2)  $\mu_0 n^2 l A$   
 (3)  $\frac{\mu_0 l A}{n}$                                 (4) none of these

47. The mutual inductance of pair of coils shown in diagram is proportional to



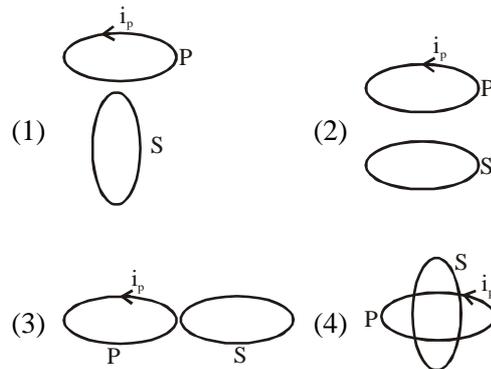
- (1)  $\frac{l}{L}$                                       (2)  $\frac{l^2}{L}$   
 (3)  $\frac{l}{L^2}$                                     (4)  $\frac{L}{l}$

48. In the diagram shown  $V_A - V_B =$



- (1) 6V                                      (2) -6V  
 (3) 2V                                      (4) -2V

49. In which of the following diagrams mutual inductance between P and S is maximum



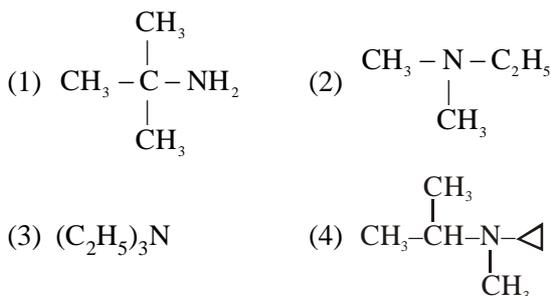
50. The inductance of a solenoid of length  $l$  and number of turns per unit length, depends on
- (1) square of number of turns length  
 (2) volume of solenoid  
 (3) geometrical factors only  
 (4) All of above

# CHEMISTRY

51. An organic compound (A) having molecular formula  $C_2H_3N$  on reaction with  $LiAlH_4$  gives sec. amine and compound (A) on hydrolysis gives primary amine. compound (A) will be

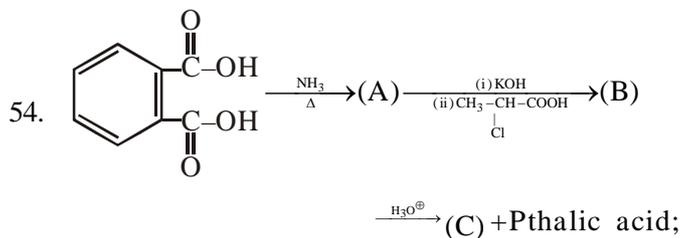
- (1) Cyanide (2) Isocyanide  
(3) Amine (4) Nitrocompound

52. Which one is not an example of tert. amine ?



53. How many no. of moles of alkyl halide will react with  $NH_3$  to form final product in presence of pyridine

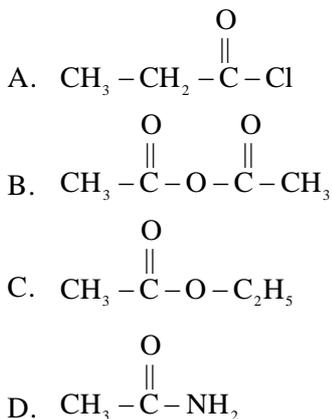
- (1) 4 (2) 3  
(3) 2 (4) 1



Compound "C" will be

- (1) Optically active (2) An amino acid  
(3) Can form Zwitter ion (4) All of these

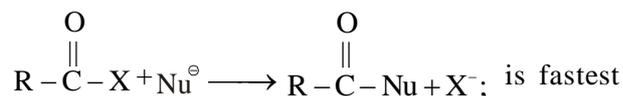
55. Out of following compounds



The decreasing order of rate of hydrolysis will be

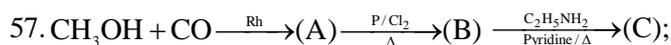
- (1)  $A > B > C > D$  (2)  $D > C > B > A$   
(3)  $A > D > B > C$  (4)  $A > B > D > C$

56. The reaction



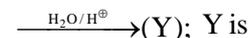
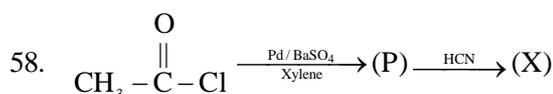
when X is

- (1)  $OCOR$  (2)  $OC_2H_5$   
(3)  $-NH_2$  (4)  $Cl$



Compound "C" will be

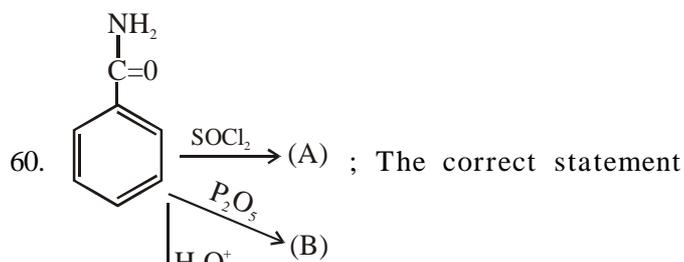
- (1) 2-N-methyl ethanoic acid  
(2) 2-N-ethyl ethanoic acid  
(3) 2-N-Ethyl methanoic acid  
(4) Tert. amine



- (1) Lactic acid  
(2) Maleic acid  
(3) Fumaric acid  
(4) Maleic anhydride

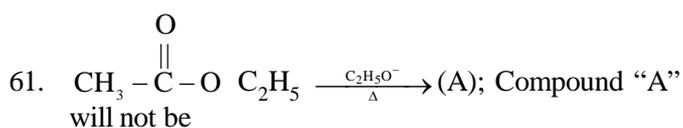
59. Halogenation of silver salt of carboxylic acid using  $CCl_4$  as solvent to form alkyl halide is an example of:

- (1) free radical halogenation  
(2) nuclear halogenation  
(3) Hunsdiecker reaction  
(4) HVZ reaction



regarding A, B & C is

- (1) All are same  
(2) A, B are similar but C is different  
(3) Hydrolysed product of A & B will be similar to C  
(4) Both (2) and (3)

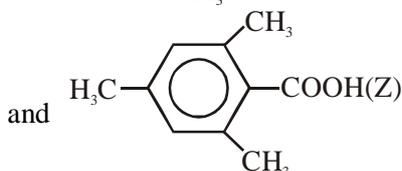
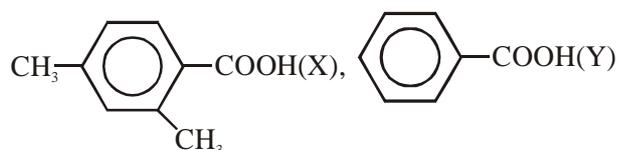


- (1) E A A (2) Optically active  
(3) Shows keto enol tautomerism  
(4) An ester group containing compound

62. An organic compound (A) which on reaction with  $\text{PCl}_5$  gives two different type of Acyl halide. The possible compound "A" will be

- (1) An alcohol (2) An anhydride  
(3) An ester (4) An ether

63. Given three acids

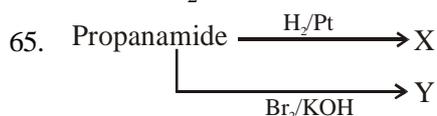


The correct order of ease of acid catalysed esterification is

- (1) X > Z > Y (2) Y > X > Z  
(3) Z > X > Y (4) Y > Z > X

64. 0.123 gm of which of the following acid will require 20 ml of M/20 KOH solution for neutralisation

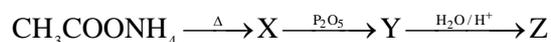
- (1) C<sub>6</sub>H<sub>5</sub>COOH (2) CH<sub>3</sub>COOH  
(3) ClCH<sub>2</sub>COOH (4) (CH<sub>3</sub>)<sub>3</sub>CHCOOH



In the above sequence of reactions

- (1) X and Y are isomers  
(2) X is 1° amine and Y is 2° amine  
(3) X and Y are homologus  
(4) Y is bromo derivative of X

66. Identify Z in the following sequence of reactions



- (1) CH<sub>3</sub>CH<sub>2</sub>CONH<sub>2</sub> (2) CH<sub>3</sub>CN  
(3) (CH<sub>3</sub>CO)<sub>2</sub>O (4) CH<sub>3</sub>COOH

67.  $\text{BrCH}_2\text{CH}_2\text{CH}_2\text{Br} \xrightarrow{\text{Alc. NaCN}} \text{X} \xrightarrow{\text{H}_3\text{O}^+} \text{Y}$ . The product Y in the above sequence is

- (1) Glutaric acid (2) 1, 3-propanedioic acid  
(3) Succinic acid (4) Melonic acid

68.  $\text{CH}_3\text{COCl} \xrightarrow{\text{X}} \text{Y} \xrightarrow[\text{H}_2\text{SO}_4]{\text{C}_2\text{H}_5\text{OH}} \text{Acetal}$ . In this sequence X is

- (1) H<sub>2</sub>/Pt (2) H<sub>2</sub>/Pd-BaSO<sub>4</sub>  
(3) Cr<sub>2</sub>O<sub>7</sub><sup>2-</sup>/H<sup>+</sup> (4) Zn-Hg/HCl

69.  $\text{CH}_3\text{COCH}_2\text{CH}_2\text{COOC}_2\text{H}_5 \xrightarrow{\text{NaBH}_4} \text{X}$

The product X is

- (1) CH<sub>3</sub>CH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>COOC<sub>2</sub>H<sub>5</sub>  
(2) CH<sub>3</sub>COCH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>OH + C<sub>2</sub>H<sub>5</sub>OH  
(3)  $\text{CH}_3\underset{\text{OH}}{\text{CH}} - \text{CH}_2\text{CH}_2\text{CH}_2\text{OH} + \text{C}_2\text{H}_5\text{OH}$

- (4)  $\text{CH}_3\underset{\text{OH}}{\text{CH}}\text{CH}_2\text{CH}_2\text{COOC}_2\text{H}_5$

70. Which of the following on reaction with chloroform produces carbylamine and gives same compound on reduction

- (1) *p*-amine (2) *sec*-amine  
(3) *tert*-amine (4) All of these

71. Hinsberg's reagent is

- (1) C<sub>6</sub>H<sub>5</sub>SO<sub>2</sub>Cl (2) C<sub>6</sub>H<sub>5</sub>COCl  
(3) C<sub>6</sub>H<sub>5</sub>COOH (4) [C<sub>6</sub>H<sub>5</sub>NH(CH<sub>3</sub>)<sub>2</sub>]Cl

72. Which of the following reagent can make distinction between primary and secondary amines ?

- (1) NH<sub>3</sub> (2) NaNO<sub>2</sub>/HCl  
(3) HCl (4) All of these

73. An organic compound (A) having molecular formula C<sub>4</sub>H<sub>6</sub>O<sub>4</sub> on heating gives compound (B) (C<sub>4</sub>H<sub>4</sub>O<sub>3</sub>); the IUPAC name of "B" is

- (1) Malic anhydride  
(2) Fumaric anhydride  
(3) Butane-1, 4-dioic anhydride  
(4) Ethanoic anhydride

74. Which of the following will not give dinitrogen gas with nitrous acid ?

- (1) Propanamine (2) Urea  
(3) Trimethylamine (4) Isopropylamine

75. Which process can convert ammonium acetate into ethanamide ?

- (1) By reduction  
(2) Heating in the presence of P<sub>2</sub>O<sub>5</sub>  
(3) Heating with H<sub>2</sub>SO<sub>4</sub>  
(4) Heating with Br<sub>2</sub>/KOH

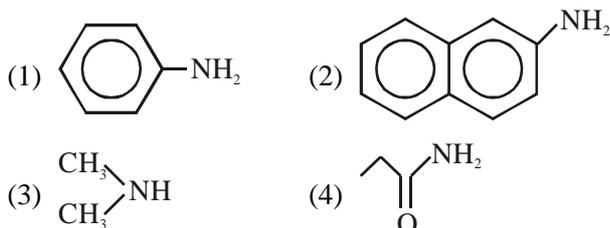
76. Acetamide is less basic than aniline because
- (1) It is an aliphatic compound
  - (2) Of greater electron withdrawing effect of adjacent carbonyl group
  - (3) Its molecular mass is low
  - (4) Of intermolecular H-bonding

77. In the given reaction

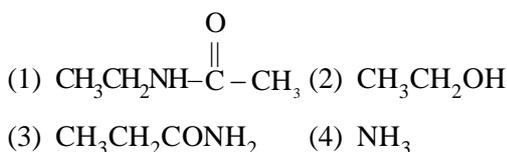


will be

- (1)  $\text{CH}_2\text{N}_2$
  - (2)  $\text{CH}_3\text{OH}/\text{H}^+$
  - (3)  $(\text{CH}_3)_2\text{SO}_4$
  - (4) All of these
78. The hybrid state of nitrogen in diethyl amine is
- (1)  $\text{sp}^3$
  - (2)  $\text{sp}^2$
  - (3)  $\text{sp}$
  - (4)  $\text{sp}^3\text{d}$
79. Which of the following exists as Zwitter ion structure ?
- (1) *p*-aminobenzene sulphonic acid
  - (2) *p*-cresol
  - (3) Picric acid
  - (4) Salicylic acid
80. Which of the following nitrogenous compound is amphoteric ?



81. Which of the following has lowest value of  $\text{pK}_b$  ?



82. Which is false in case of carboxylic acids?

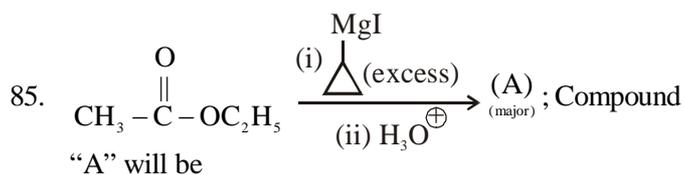
- (1) They are polar molecules
- (2) They form H-bonds
- (3) They are stronger than mineral acids
- (4) They have higher b.p. than corresponding alcohols

83. Which of the following will not undergo Hell Volhard Zelinsky reaction?

- (1)  $\text{CH}_3\text{COOH}$
- (2)  $\text{CH}_3\text{CH}_2\text{COOH}$
- (3) 2,2-dimethyl propionic acid
- (4) 2-methyl propionic acid

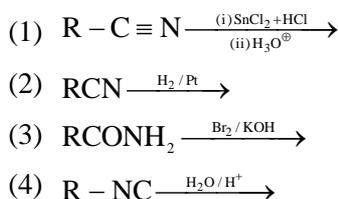
84. The order of increasing basic strength among *m*-toluidine (I), *p*-toluidine (II) and *o*-toluidine (III) is

- (1)  $\text{III} < \text{II} < \text{I}$
- (2)  $\text{I} < \text{III} < \text{II}$
- (3)  $\text{III} < \text{I} < \text{II}$
- (4)  $\text{II} < \text{I} < \text{III}$



- (1) An cyclo alcohol
- (2) An cyclo alkane
- (3) A cyclo ketone
- (4) An aldehyde

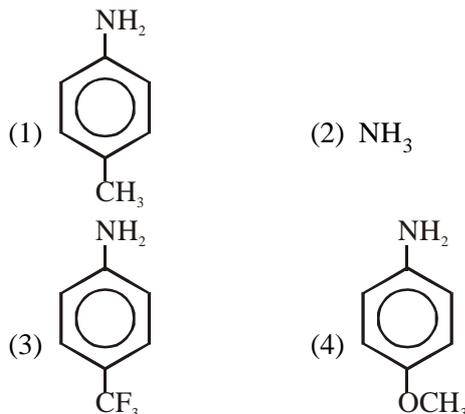
86. Which one of the following reaction does not produce amine ?



87. The total number of structural isomers of aromatic amines containing carbocyclic rings and having formula  $\text{C}_7\text{H}_9\text{N}$  is

- (1) 2
- (2) 3
- (3) 4
- (4) 5

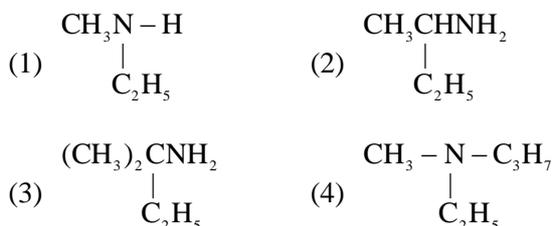
88. Which of the following aromatic amine is least basic?



89. Which of the following amine is stronger base as compared to ammonia ?

- (1) Cyclohexylamine
- (2) Aniline
- (3) Diphenyl amine
- (4) Triphenyl amine

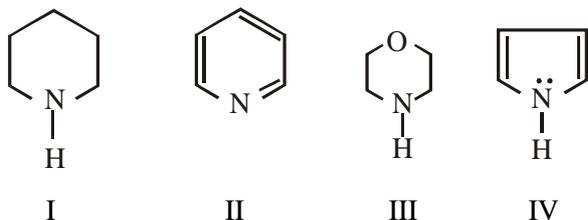
90. Which of the following amine chiral structure but cannot show optical activity ?



91. Ammonia and phthalic acid react to produce  
 (1) Benzamide (2) *o*-Amino benzoic acid  
 (3) *o*-phenylenediamine (4) Phthalimide

92.  $\text{PhCOOH} \xrightarrow[\text{(ii) KOD, Br}_2/\text{D}]{\text{(i) NH}_3/\text{D}}$  "A" Compound "A" will be  
 (1)  $\text{PhNH}_2$  (2)  $\text{PhND}_2$   
 (3)  $\text{PhCH}_2\text{-NH}_2$  (4)  $\text{PhCH}_2\text{-NHD}$

93. In the following compounds,

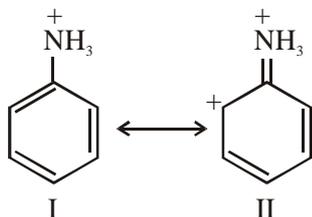


The order of basicity is :

- (1)  $\text{IV} > \text{I} > \text{III} > \text{II}$  (2)  $\text{III} > \text{I} > \text{IV} > \text{II}$   
 (3)  $\text{II} > \text{I} > \text{III} > \text{IV}$  (4)  $\text{I} > \text{III} > \text{II} > \text{IV}$
94.  $\text{C}_6\text{H}_5\text{COCl} \xrightarrow{\text{NH}_3} \text{X} \xrightarrow[\text{H}_2]{\text{P}_2\text{O}_5} \text{Y} \xrightarrow{\text{Ni}} \text{Z}$ . The end product in the above sequence of reactions is  
 (1) Benzoic acid (2) Aniline  
 (3) Benzyl amine (4) Benzonitrile
95. One mole of ethylamine when reacts with nitrous acid will produce dinitrogen gas at  $0^\circ\text{C}$  and 1 atm pressure equal to  
 (1) 1 L (2) 22.4 L  
 (3) 11.2 L (4) 24.8 L
96.  $\text{C}_6\text{H}_5\text{COOH} \xrightarrow[\text{Py}]{\text{SOCl}_2} \text{A} \xrightarrow{\text{NH}_3} \text{B} \xrightarrow{\text{P}_2\text{O}_5} \text{C} \xrightarrow{\text{H}_2/\text{Pd}} \text{D}$

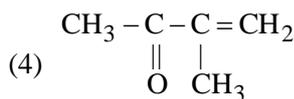
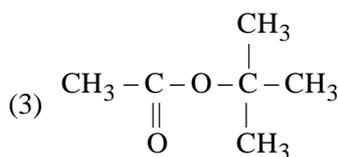
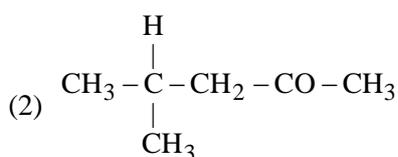
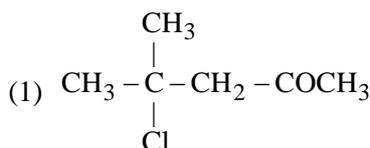
In the above sequence D is

- (1) Aniline (2) Benzylamine  
 (3) Phenol (4) Cyclohexylamine
97. Pickup the correct statement about the following resonating forms of anilinium ion



- (1) II is not an acceptable canonical structure because carbonium ions are less stable than ammonium ions

- (2) II is not an acceptable canonical structure because it is non-aromatic  
 (3) II is not an acceptable canonical structure because the nitrogen has 10 valence electrons  
 (4) Both the structures are acceptable canonical forms
98. Indicate the organic structure for product expected when 2-methyl propene is heated with acetyl chloride in presence of anhydrous  $\text{ZnCl}_2$  :



99. Sodium salt of which one of the monobasic acid on electrolysis does not gives hydrocarbon ?  
 (1)  $\text{PhCOOH}$  (2)  $\text{HCOOH}$   
 (3)  $\text{Me}_3\text{C-COOH}$   
 (4)  $\text{COOH-CH=CH-COOH}$
100. Column I                      Column II  
 (Reagents reacting with  $\text{PhCH}_2\text{COOH}$ )                      (Product formed)
- (a)  $\text{CH}_3\text{MgBr}$                       (p)  $\text{PhCH}_2\text{COCl}$   
 (b)  $\text{PCl}_5$                       (q)  $\text{PhCH}_2\text{COOCH}_3$   
 (c)  $\text{NH}_3$  followed by heating                      (r)  $\text{CH}_4$   
 (d)  $\text{CH}_3\text{OH}$  in the presence of conc.  $\text{H}_2\text{SO}_4$                       (s)  $\text{PhCH}_2\text{CONH}_2$
- The correct match is  
 (1) a-r, b-p, c-s, d-q (2) a-p, b-r, c-q, d-s  
 (3) a-r, b-q, c-p, d-s (4) a-q, b-p, c-r, d-s

## BOTANY

101. If you discovered a bacterial cell that had no restriction enzyme, which of the following would you expect to happen ?
- (1) The cell would be unable to replicate its DNA
  - (2) The cell would create incomplete plasmids
  - (3) The cell would be easily infected and lysed by viruses
  - (4) The cell would become a parasite
102. DNA probes used in finger printing are :
- (1) Fluorescent
  - (2) Radioactive
  - (3) Having  $^{15}\text{N}$
  - (4) All of these
103. Collection of organisms as bacteria that all contain the same piece of recombinant DNA is called :
- (1) Gene cloning
  - (2) Cell cloning
  - (3) Organ cloning
  - (4) All of these
104. DNA that is useful for DNA finger printing is located in:
- (1) Nucleolar organizer region
  - (2) Centromeric region of DNA
  - (3) Intron region of gene coding for mRNA
  - (4) Hypervariable tandem repeats region
105. Cloned sheep dolly resembled the sheep from which
- (1) Egg cell was taken
  - (2) Udder cell was taken
  - (3) Surrogation was achieved
  - (4) None of these
106. Which was the first restriction enzyme to be isolated
- (1) Eco RI
  - (2) Hind II
  - (3) Hae III
  - (4) Pvu I
107. Single nucleotide polymorphism are seen in Human genome in about
- (1) 5 million locations
  - (2) 2.5 million locations
  - (3) 1.4 million locations
  - (4) 0.4 million locations
108. Humans are different from each other in ..... of genome
- (1) 50%
  - (2) 5%
  - (3) 0.1%
  - (4) 0.01%
109. The process of creation of transient/temporary pores in the bacterial cell wall is called :
- (1) Electroporation
  - (2) Microinjection
  - (3) Southern blotting
  - (4) Lysis
110. Manipulation of DNA in genetic engineering became possible due to the discovery of :
- (1) Restriction endonuclease
  - (2) DNA ligase
  - (3) Transcriptase
  - (4) Primase
111. Enzyme alkaline phosphatases cut off phosphate group :
- (1) From 3' end of DNA strand
  - (2) From 5' end of DNA strand
  - (3) From any point of DNA strand
  - (4) From any point of RNA strand
112. Which is commonly known as 'molecular scissors'?
- (1) Reverse transcriptase
  - (2) DNA polymerase
  - (3) DNA ligase
  - (4) Restriction endonuclease
113. Which of the following statements is incorrect
- (1) 50% of human genome is made up of repetitive sequences
  - (2) 4 chromosome has least number of genes
  - (3) Human genes have no introns
  - (4) In human genome less than 2% has coding regions
114. Gene gun can introduce genes into target cells with the help of :
- (1) Plasmids
  - (2) Cosmids
  - (3) Microscopic pellets
  - (4) Phagemids
115. DNA of plasmids is :
- (1) Double stranded and circular
  - (2) Single stranded circular
  - (3) Double stranded linear
  - (4) Single stranded linear
116. Molecular markers in DNA mapping are known as
- (1) Gene probes
  - (2) Sequence tagged sites
  - (3) DNA sequences
  - (4) DNA analysers
117. DNA fingerprint profile will be exactly same of :
- (1) Siblings
  - (2) Offsprings
  - (3) Identical twins
  - (4) Fraternal twins
118. Minisatellite and microsatellite DNA are similar to :
- (1) RFLP
  - (2) RAPD
  - (3) STR
  - (4) VNTR

119. Bacteria with same recombinant DNA segment in their amplified form are called :
- (1) Clone library
  - (2) Gene library
  - (3) Gene pool
  - (4) Gene frequency
120. In the process of recombinant DNA technology, the isolated foreign DNA is inserted into another DNA molecule known as :
- (1) DNA vector
  - (2) RNA vector
  - (3) Protein vector
  - (4) Cloning vector
121. Which recent technique used for separating DNA fragments ?
- (1) Southern blotting
  - (2) Eastern blotting
  - (3) Western blotting
  - (4) Northern blotting
122. Last chromosome to be sequenced in Human genome is
- (1) Chr 2
  - (2) Chr X
  - (3) Chr 4
  - (4) Chr 1
123. Methodology used in HGP uses two approaches, one approach focussed on identifying all the genes that expressed as RNA, referred to as :
- (1) Sequence annotation
  - (2) Expressed sequence tags
  - (3) Single nucleotide polymorphism
  - (4) Minisatellite
124. Highest number of gene is present in chromosome I, it has ..... genes
- (1) 2968
  - (2) 234
  - (3) 231
  - (4) 3000
125. Enzyme derived from bacterium *Thermus aquaticus* is used for
- (1) Electrophoresis
  - (2) PCR
  - (3) Southern blotting
  - (4) RFLA
126. VNTR patterns are inherited
- (1) Environmentally
  - (2) Genetically
  - (3) Harmonally
  - (4) Both (1) and (2)
127. Which of the following DNA sequences would a restriction enzyme recognize and cut?
- |            |            |
|------------|------------|
| (1) ATGCAC | (2) GATATC |
| (1) TACGTG | (2) CTATAG |
| (3) TAGATA | (4) AATATA |
| (3) ATCTAT | (4) TTATAT |
128. Gene banks are useful in
- (1) In situ conservation
  - (2) Ex situ conservation
  - (3) Gene libraries
  - (4) Human genome analysis only
129. Phagemid vectors are composed of
- (1) Plasmid and bacteriophage
  - (2) Yeast cells and plasmids
  - (3) Cos site of  $\lambda$  phage and plasmid
  - (4) Plasmid of *E. coli* and YAC
130. Polymerase chain reaction makes use of DNA polymerase enzyme which is :
- (1) A terminal transferase
  - (2) Thermolabile
  - (3) Thermostable
  - (4) Modular enzyme
131. Restriction endonucleases are most widely used in recombinant DNA technology. They are obtained from :
- (1) Bacteriophage
  - (2) Bacterial cells
  - (3) Plasmids
  - (4) All prokaryotic cells
132. In pBR 322, BR stands for
- (1) Name of bacteriophage
  - (2) Name of scientists
  - (3) Type of DNA used
  - (4) Type of plasmid
133. Restriction enzyme EcoRI cleavages DNA at the sequence
- (1) AAGCTT
  - (2) AAGTTC
  - (3) GTATATC
  - (4) GAATTC
134. The enzymes which are commonly used in genetic engineering :
- (1) Restriction endonuclease and polymerase
  - (2) Endonuclease and ligase
  - (3) Restriction endonuclease and ligase
  - (4) Ligase and polymerase
135. In *E. coli* cloning vector pBR 322, ROP codes for
- (1) Origin sequence
  - (2) Restriction sites
  - (3) The proteins involved in the replication of the plasmids
  - (4) Antibiotic resistance genes
136. Sequence Annotation is a process involved in
- (1) D.N.A. finger printing
  - (2) Decoding human genome
  - (3) Northern blotting
  - (4) Cloning of Dolly

137. Which of the following scientist credited for the discovery of P.C.R. technique?
- (1) Alec Jeffrey
  - (2) Nirenberg
  - (3) Karymullis
  - (4) E.M. Southern
138. Ampicillin and tetracycline resistance sites on pBR322 act as
- (1) Origin of replication site
  - (2) Site for restriction endonuclease EcoRI
  - (3) Marker sites
  - (4) Both (2) and (3)
139. If a vector can function in both bacterial and eukaryotic cell it is called as
- (1) Transient vector
  - (2) Marker vectors
  - (3) Transfer vector (T-vector)
  - (4) Shuttle vector
140. Type I restriction enzyme :
- (1) Recognize the specific sequence and cleave DNA at the specific sequence
  - (2) Do not recognize or cleave the specific sequence
  - (3) Recognize specific sequence but cleave non specific sequence
  - (4) None of these
141. Which of the following cleaves forming sticky ends
- (1) Hae III                      (2) Alu I
  - (3) Hind II                      (4) Eco RII
142. Restriction endonucleases are named after
- (1) Scientists who discovered them
  - (2) Bacteria from which they have been extracted
  - (3) Host cells they attack
  - (4) Enzyme used for their extraction
143. *Ori* sequence in plasmid refers to :
- (1) Sequence for antibody resistance
  - (2) Sequence from which replication will start in plasmid
  - (3) Sequence for restriction site
  - (4) Both (1) and (3)
144. The human genome contains \_\_\_\_\_ Million nucleotides bases
- (1) 2.4                              (2) 3164.7
  - (3) 1346.7                        (4) 4613.7
145. Restriction endonucleases
- (1) are used for invitro D.N.A. synthesis
  - (2) are synthesized by bacteria as a part of their defense mechanism
  - (3) are present in mammalian cell for degradation of D.N.A. when the cell dies
  - (4) are used in genetic engineering for ligating two D.N.A. molecules
146. The nuclease enzyme, which begins its attack from free end of a polynucleotide, is ?
- (1) Exonuclease
  - (2) Kinase
  - (3) Polymerase
  - (4) Endonuclease
147. Choose the incorrect match :
- (1) Western blotting : Protein
  - (2) Northern blotting : RNA
  - (3) Southern blotting : DNA
  - (4) Western blotting : DNA
148. Known sequence of DNA that is used to find complementary DNA strand is :
- (1) Vector
  - (2) Plasmid
  - (3) DNA probe
  - (4) Recombinant DNA
149. Gene therapy involves :
- (1) Introducing of a normal genes in cell
  - (2) Eliminating defective and useless genes
  - (3) Treating of defective genes with radiations
  - (4) Replacement of defective genes by normal ones
150. Construction of a recombinant DNA involves :
- (1) Cleaving and rejoining DNA segments with 'endonuclease' alone
  - (2) Cleaving DNA segments with 'endonuclease' and rejoining them with 'ligase'
  - (3) Cleaving DNA segments with 'ligase' and rejoining them with 'endonuclease'
  - (4) Cleaving and rejoining DNA segments with 'ligase' alone

## ZOOLOGY

151. Which of the following statement is not true ?
- (1) Industrial melanism supports evolution by natural selection
  - (2) Bacterial population having mutation can become resistant to antibiotics
  - (3) Excess use of herbicide, pesticides has, resulted in selection of resistant varieties in much larger time scale
  - (4) Evolution is not a directed process in sense of determinism
152. *Drosophila pseudoobscura* and *Drosophila persimilis* are
- (1) Sibling species
  - (2) Can cross-fertilize
  - (3) Morphological dissimilar
  - (4) All of these
153. In which type of natural selection, individuals at both extremes of the distribution are rejected ?
- (1) Normalizing selection
  - (2) Directional selection
  - (3) Diversifying selection
  - (4) Progressive selection
154. Which of the following statement is not true ?
- (1) Evolution will occur in a population following Hardy-Weinberg law
  - (2) Study of frequency of genes in population is called population genetics
  - (3) Application of Mendelian genetics to Darwinian natural selection is population genetics
  - (4) Concept of adaptive radiation in evolution was developed by H.F. Osborn
155. Kettlewell found more dark moths in areas affected by industrial pollution than the light moths. This is due to
- (1) Increased frequency of recessive allele responsible for dark colour which had more selective advantage
  - (2) Lethal mutation
  - (3) Increased frequency of dominant allele responsible for dark coloured moth which had more selective advantage
  - (4) High fecundity
156. The sickle-cell (S) allele has a relatively high frequency in central Africa, even though individuals homozygous for this allele usually die before they reach reproductive age. Why has this allele persisted in the population in high frequencies when there appears to be such strong natural selection against it ? Which of the following are correct statements ?
- A. Because of its role in malaria resistance in heterozygotes
  - B. Because individuals homozygous for this characteristic are resistant to malaria
  - C. Because females heterozygous for this allele are more fertile than are those who lack it
  - D. Because females homozygous for this allele are more fertile than those who lack it
- (1) A only
  - (2) B and C
  - (3) A and C
  - (4) B and D
157. Sickle cell anaemia is a clear evidence of, which of following changes in natural populations
- (1) Balancing selection and microevolutionary changes
  - (2) Balancing selection and macroevolutionary changes
  - (3) Disruptive selection
  - (4) Disruptive selection and macroevolutionary changes
158. When natural selection acts to eliminate rather than favour intermediate phenotypes, it is called as
- (1) Balancing selection
  - (2) Stabilising selection
  - (3) Disruptive selection
  - (4) Non-directional selection
159. The phrase 'Survival of Fittest' was given by
- (1) Charles Darwin
  - (2) Herbert Spencer
  - (3) Jean Baptiste Lamarck
  - (4) Hugo de Vries
160. The different varieties of pigeon like Pouter, Jacobin, Fantail are the examples of
- (1) Natural selection
  - (2) Artificial selection
  - (3) Allopatric speciation
  - (4) Geographical isolation
161. The best description of natural selection is
- (1) The survival of the fittest
  - (2) The struggle for existence
  - (3) The reproductive success of the members of a population best adapted to the environment
  - (4) The overproduction of offspring in environments with limited natural resources
162. Genetic drift is likely to be seen in a population
- (1) That has a high migration rate
  - (2) That has a low mutation rate
  - (3) In which there is assortative mating
  - (4) That is very small

163. Gene flow often results in
- (1) Populations that are better adapted to the environment
  - (2) An increase in sampling error in the formation of the next generation
  - (3) Adaptive microevolution
  - (4) A reduction of the allele frequency differences between populations
164. The existence of two distinct phenotypic forms in a species is known as
- (1) Geographic variation
  - (2) Stabilizing selection
  - (3) Heterozygote advantage
  - (4) Polymorphism
165. Mutations are rarely the cause of microevolution because
- (1) They are most often harmful and do not get passed on
  - (2) They may be masked in diploid individuals and are not able to be selected for
  - (3) They occur very rarely
  - (4) All of the above
166. What prevents horses and donkeys from hybridizing to form a new species?
- (1) Gametic isolation
  - (2) Reduced hybrid viability
  - (3) Mechanical isolation
  - (4) Reduced hybrid fertility
167. Sexual selection may lead indirectly to reproductive barriers because
- (1) Isolated populations are exposed to different selection pressures
  - (2) Natural selection acts on characteristics that maximize successful mating within a species
  - (3) Hybrids may be reproductively less fit
  - (4) Prezygotic barriers are more likely to evolve before postzygotic barriers
168. A scientist measures the average tail length of a wild population of birds over a period of 10 generations. During this period, he observes a gradual increase in average tail length. Which process could account for this increase ?
- |                         |                               |
|-------------------------|-------------------------------|
| (i) Genetic drift       | (ii) Emigration               |
| (iii) Natural selection | (iv) Immigration              |
| (1) (i) only            | (2) (i) and (iii) only        |
| (3) (ii) and (iv) only  | (4) (i), (ii), (iii) and (iv) |
169. In which of the following selection regimes is speciation most likely to occur ?
- (1) Stabilizing selection
  - (2) Directional selection
  - (3) Disruptive selection
  - (4) No selection
170. A new characteristic usually appears in evolution as a result of :
- (1) Accumulation of point mutation in a gene which originally encoded for something else
  - (2) Duplication of a gene and accumulation of point mutations in one of the copies coming from that duplication
  - (3) A mutation in a regulator gene
  - (4) Genotypical recording of favourable phenotypical adaptation
171. Natural selection is a process that may result in evolution. If evolution is to occur, which of the following must be true ?
- (i) Individuals within a species are variable
  - (ii) Some of the variations within species are passed on to the offspring (i.e., they are inherited).
  - (iii) More individuals are produced than the environment can support; only a fraction of the offspring produced in each generation survive to reproduce
  - (iv) The survival and reproduction of individuals are not random; the individuals who survive and go on to reproduce, or who reproduce the most, are those with the most favourable variations
- |                       |                  |
|-----------------------|------------------|
| (1) i, ii and iii     | (2) i, ii and iv |
| (3) i, ii, iii and iv | (4) iii only     |
172. Speciation is most likely to occur in a species with a number of populations when there is a:
- (1) Large population living in a niche with an environment like that of other populations
  - (2) Small population living in a niche with an environment like that of other population
  - (3) Small population living in an isolated niche
  - (4) Large population living in an isolated niche
173. Which of the following is not required for the size of a given trait to evolve by natural selection ?
- (1) The size of the trait varies among individuals in population
  - (2) There is a relationship between the size of the trait and the fitness (reproductive success) of the bearer of the trait
  - (3) The size of the trait has genetic basis
  - (4) Individuals with larger value of traits live longer

174. Which of the following was not part of Darwin's explanation of natural selection ?
- (1) Organisms commonly produce more offspring than can possibly survive
  - (2) Variations exist within each species
  - (3) Members of a species compete with each other for food and space
  - (4) Genes are passed on from parent to offspring
175. Which of the following are necessary for evolution by natural selection to take place?
- (i) Offspring resemble their parents more than to other individuals in the population
  - (ii) Differences among individuals exist and lead to different numbers of successful offspring being produced
  - (iii) Individuals adjust their development depending on the environment
  - (iv) Every individuals has a desire to have many offspring
  - (v) Populations tend to grow faster than their food supplies
- (1) i and ii                      (2) i and v
  - (3) ii, iii and iv                (4) ii and v
176. A population is in genetic equilibrium when genotype and allele frequencies remain the same from one generation to the next. Genetic equilibrium will occur when :
- (1) Populations are small, thus more likely to be affected by genetic drift
  - (2) Beneficial mutations arise
  - (3) There is no immigration and emigration
  - (4) There is mating between close relatives
177. Which form of natural selection can lead to differentiation in species and to polymorphism ?
- (1) Directional selection
  - (2) Stabilizing selection
  - (3) Disruptive selection
  - (4) Density dependent selection
178. A botanist is studying leaf size in a natural population of plants. The second season is particularly dry, and the following year, the average leaf size in the population is smaller than the year before. But, the amount of overall variation is the same and the population size has not changed. Also, he did experiments which show that small leaves are better adapted to dry conditions than the large leaves. Which of the following has occurred ?
- (1) Genetic drift                (2) Directional selection
  - (3) Stabilizing selection      (4) Disruptive selection
179. Directional selection
- (1) Shifts character traits in a specific direction
  - (2) Acts against individuals who deviate too far from the average
  - (3) Adapts individuals within a population to different habitats
  - (4) None of the above
180. Stabilizing selection
- (1) Shifts character traits in a specific direction
  - (2) Acts against individuals who deviate too far from the average
  - (3) Favours individuals who possess an average value for a trait
  - (4) Both (2) and (3)
181. Sexual selection will
- (1) Select for traits that enhance an individual's chances of mating
  - (2) Increase assortative mating
  - (3) Result in individuals better adapted to the environment
  - (4) Result in stabilizing selection
182. Most of the time, species are identified by their appearances. Why ?
- (1) If two organisms look alike, they must be the same species
  - (2) This is the criterion used to define a biological species
  - (3) If two organisms look different, they must be different species
  - (4) This is the most convenient way of identifying species
183. A deleterious allele decreases more rapidly in frequency, if it is
- (1) Recently mutated      (2) Rare
  - (3) Dominant                (4) Recessive
184. In some birds such as the peacock and pheasant, the males are more colourful than the females. The selective agent producing the evolution of such conspicuous features is
- (1) Females                      (2) Predators
  - (3) Humans                      (4) Climate
185. Which of the following changes in the gene pool results in adaptation to the environment ?
- (1) Non-random mating      (2) Genetic drift
  - (3) Natural selection        (4) Gene flow

186. Which of the following processes is adaptive ?  
 (1) Genetic drift (2) Mutation  
 (3) Gene flow (4) Natural selection
187. All the members of a bird population have the same intermediate green colouration. What type of selection is likely taking place ?  
 (1) Disruptive (2) Directional  
 (3) Stabilizing (4) Diversifying
188. Evolution works on the  
 (1) Genes of an individual  
 (2) Phenotypes of individual organisms  
 (3) Allele frequencies in a population  
 (4) Birds with small beaks
189. Balancing selection is connected with successful reproduction of  
 (1) Homozygous recessives  
 (2) Homozygous dominants  
 (3) Heterozygous individuals  
 (4) All of the above
190. Random genetic drift in a population probably results from  
 (1) Highly genetically variable individuals  
 (2) Inter-breeding within these populations  
 (3) Constant low mutation rate  
 (4) Large population size
191. Industrial melanism is an example of  
 (1) Drug resistance  
 (2) Darkening of skin due to smoke from industries  
 (3) Protective resemblance with the surroundings  
 (4) Defensive adaptation of skin against ultraviolet radiations
192. Which of the following influenced Darwin in formulating the theory of "Natural selection"  
 (1) Charles Lyell's Principles of Geology  
 (2) Finches of Galapagos islands  
 (3) T.R. Malthus's Principles of population  
 (4) All of these
193. Who produced different varieties of pigeon like Jacobin, Pouter etc.  
 (1) Darwin (2) Wallace  
 (3) Spencer (4) Dobzhansky
194. Sudden change in gene frequency due to some chance event like natural calamity is called  
 (1) Centripetal selection (2) Centrifugal selection  
 (3) Genetic drift (4) Normalising selection
195. Frequency of a particular allele increases among offsprings of colonizers inhabiting isolated islands. This is an example of  
 (1) Bottleneck effect (2) Founder effect  
 (3) Heterosis (4) Genetic polymorphism
196. Mutation theory was given by  
 (1) Hugo de Vries  
 (2) Theodosius Dobzhansky  
 (3) August Weismann (4) Alfred Wallace
197. Hunting of cheetahs has resulted in reduced genetic variability among their population. This is an example of  
 (1) Heterosis  
 (2) Balanced polymorphism  
 (3) Bottleneck effect (4) Founder effect
198. Which of the following statement is false  
 (1) Genetic drift operates in small as well as large population  
 (2) Genetic drift is a non random process  
 (3) *Oenothera lamarckiana* plant is a complex heterozygote with abnormal chromosomal behaviour  
 (4) Trait selected by natural selection is favourable or beneficial to entire species
199. Natural selection is a process by which organisms which are ..... better adapted, survive reproduce & produce more number of offsprings  
 (1) Physically & physiologically  
 (2) Physiologically & behaviorally  
 (3) Physically & behaviorally  
 (4) Physically, physiologically & behaviorally
200. Neonates with birth weight 7.5 pounds have better chances of survival as compared to babies with birth weight less than 5 pounds or more than 10 pounds. This is an example of  
 (1) Normalizing selection  
 (2) Progressive selection  
 (3) Directional selection  
 (4) Disruptive selection

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**TEST NO. : 10****ANSWERS**

1. (2)	41. (3)	81. (1)	121. (1)	161. (3)
2. (4)	42. (2)	82. (3)	122. (4)	162. (4)
3. (2)	43. (4)	83. (3)	123. (2)	163. (4)
4. (1)	44. (3)	84. (3)	124. (1)	164. (4)
5. (2)	45. (2)	85. (2)	125. (2)	165. (4)
6. (3)	46. (2)	86. (1)	126. (2)	166. (4)
7. (4)	47. (2)	87. (4)	127. (2)	167. (2)
8. (2)	48. (1)	88. (3)	128. (2)	168. (4)
9. (2)	49. (2)	89. (1)	129. (1)	169. (3)
10. (3)	50. (4)	90. (4)	130. (3)	170. (2)
11. (2)	51. (2)	91. (4)	131. (2)	171. (3)
12. (1)	52. (1)	92. (2)	132. (2)	172. (3)
13. (3)	53. (1)	93. (4)	133. (4)	173. (4)
14. (2)	54. (4)	94. (3)	134. (3)	174. (4)
15. (1)	55. (1)	95. (2)	135. (3)	175. (4)
16. (3)	56. (4)	96. (2)	136. (2)	176. (3)
17. (3)	57. (2)	97. (3)	137. (3)	177. (3)
18. (3)	58. (1)	98. (1)	138. (3)	178. (2)
19. (2)	59. (3)	99. (2)	139. (4)	179. (1)
20. (3)	60. (4)	100. (1)	140. (3)	180. (4)
21. (4)	61. (2)	101. (3)	141. (3)	181. (1)
22. (3)	62. (2)	102. (2)	142. (2)	182. (4)
23. (3)	63. (2)	103. (1)	143. (2)	183. (3)
24. (2)	64. (1)	104. (4)	144. (2)	184. (1)
25. (4)	65. (3)	105. (2)	145. (2)	185. (3)
26. (3)	66. (4)	106. (2)	146. (1)	186. (4)
27. (4)	67. (2)	107. (3)	147. (4)	187. (3)
28. (3)	68. (2)	108. (3)	148. (3)	188. (3)
29. (1)	69. (4)	109. (1)	149. (4)	189. (3)
30. (1)	70. (1)	110. (1)	150. (2)	190. (2)
31. (1)	71. (1)	111. (2)	151. (3)	191. (3)
32. (4)	72. (2)	112. (4)	152. (1)	192. (4)
33. (3)	73. (3)	113. (3)	153. (1)	193. (1)
34. (1)	74. (3)	114. (3)	154. (1)	194. (3)
35. (3)	75. (2)	115. (1)	155. (3)	195. (2)
36. (4)	76. (2)	116. (2)	156. (3)	196. (1)
37. (3)	77. (4)	117. (3)	157. (1)	197. (3)
38. (1)	78. (1)	118. (4)	158. (3)	198. (2)
39. (1)	79. (1)	119. (2)	159. (2)	199. (4)
40. (3)	80. (4)	120. (4)	160. (2)	200. (1)