# REVISION TEST SERIES

(*for* NEET-2022)
Test – 2

Topics covered :

Physics **:** Current Electricity

Chemistry **:** Alcohols, Phenols and Ethers

Botany **:** Principles of Inheritance and Variations

Zoology **:** Reproductive Health

Instructions :

(i) There are two sections in each subject, i.e. Section-A & Section-B. You have to attempt all 35 questions from Section-A & only 10 questions from Section-B out of 15.

(ii) Each question carries 4 marks. For every wrong response 1 mark shall be deducted from the total score. Unanswered / unattempted questions will be given no marks.

(iii) Use blue/black ballpoint pen only to darken the appropriate circle.

(iv) Mark should be dark and completely fill the circle.

(v) Dark only one circle for each entry.

(vi) Dark the circle in the space provided only.

(vii) Rough work must not be done on the Answer sheet and do not use white-fluid or any other rubbing material on the Answer sheet.


PHYSICS

Choose the correct answer:

SECTION-A

1. The current (I) voltage (V) graphs for a given ohmic conductor at two different temperatures T_1 and T_2 are shown in the figure. Choose the correct statement. (R_1 and R_2 are the resistance of specimen at temperature T_1 and T_2 respectively)
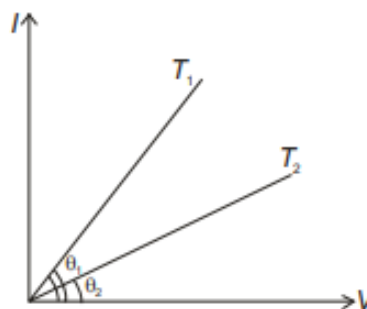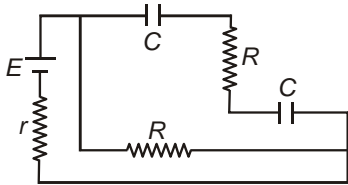

   (1) $R_1 > R_2$ (2) $R_2 > R_1$

   (3) $T_1 = T_2$ (4) $T_2 < T_1$

2. Charge stored on the capacitor of capacitance 10 μF connected in the circuit as shown in figure, in steady state is
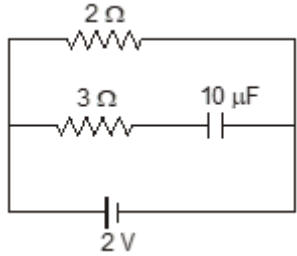
(1) 20 μC (2) 15 μC
(3) 10 μC (4) Zero

3. A circuit consists of a source of emf E and internal resistance r, capacitors each of capacitance C and resistors each of resistance R. Potential drop across any of the capacitor at steady state is


(1) $\dfrac{ER}{2(R+r)}$ (2) $\dfrac{ER}{R+r}$

(3) $\dfrac{E(R+r)}{2R}$ (4) Zero

4. The drift velocity of the electrons in a copper wire of length 2 m under the application of a potential difference 100 V is 0.025 m/s. The mobility of electron (in $m^2V^{-1}s^{-1}$) is

(1) 5×10^2 (2) 2.5×10^{-3}
(3) 5×10^{-4} (4) 2.5×10^{-2}

5. A wire with uniform cross-section and resistance 4 Ω is bent to form a circle as shown in the figure. The resistance between A and B is
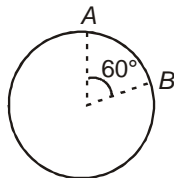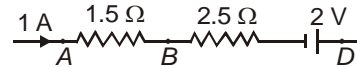

(1) $\dfrac{5}{9}\,\Omega$ (2) $4\,\Omega$

(3) $\dfrac{9}{5}\,\Omega$ (4) $\dfrac{2}{3}\,\Omega$

6. Six equal resistances are connected between points P, Q and R as shown in figure. The net resistance will be maximum across the points
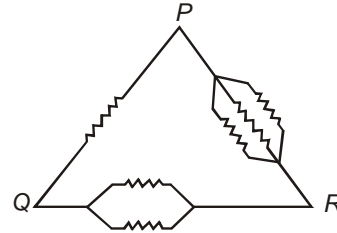

(1) P and Q
(2) Q and R
(3) P and R
(4) Between any two points are equal

7. In the circuit element given here, If the potential at point B is zero, then potential of points A and D can be given as

(1) $V_A = -1.5$ V, $V_D = +2$ V
(2) $V_A = +1.5$ V, $V_D = +2$ V
(3) $V_A = +1.5$ V, $V_D = +0.5$ V
(4) $V_A = +1.5$ V, $V_D = -0.5$ V

8. If the switch S is closed in the circuit shown in figure, how much current will pass through it?
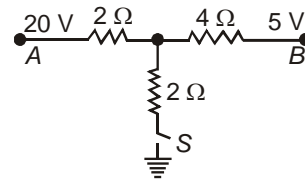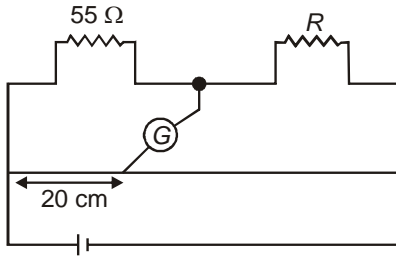

(1) 4.5 A (2) 6.0 A
(3) 3.0 A (4) Zero

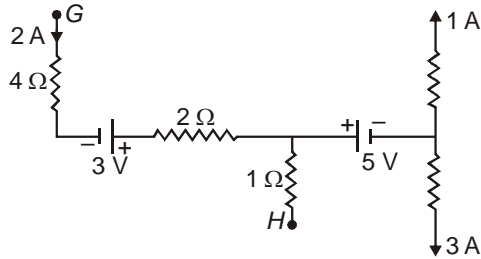9. In the circuit shown in figure, if voltage drop across any of 2 Ω resistance is 2 V, then emf of the cell is
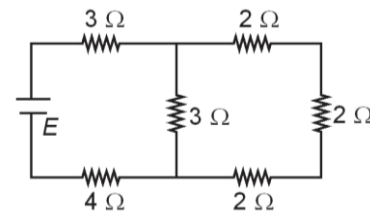

(1) 25 V (2) 27 V
(3) 13 V (4) 30 V

10. The value of unknown resistance for null deflection in galvanometer, as shown in meter bridge circuit is

(1) 220 Ω   (2) 110 Ω

(3) 55 Ω   (4) 13.75 Ω

11. In the part of circuit shown in the figure, the potential difference between points G and H ($V_G - V_H$) is

(1) 0 V   (2) 15 V

(3) 7 V   (4) 3 V

12. All the resistors in given circuit have same resistance and equivalent resistance between A and B is R_0. Now keys are closed, then equivalent resistance can be expressed as
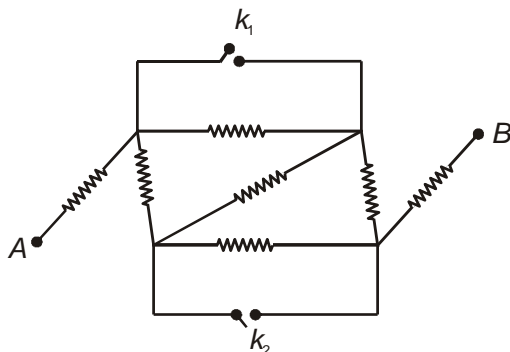
(1) $\dfrac{7R_0}{3}$ (2) $\dfrac{7R_0}{9}$

(3) $7R_0$ (4) $\dfrac{R_0}{3}$

13. On increasing the temperature, the resistivity of the material
(1) Always increases
(2) Always decreases
(3) May increase or decrease
(4) Remains same

14. In the circuit shown in figure if power dissipated in the 9 Ω resistor is 36 W, then potential difference across 2 Ω resistor is
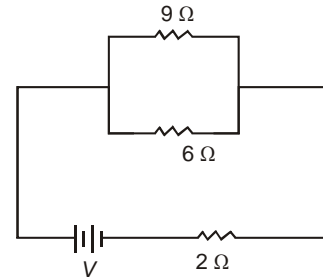
(1) 5 V   (2) 10 V
(3) 18 V   (4) 20 V

15. The charge passing through a resistor is varying with time as shown in the graph. The amount of heat generated with time t is best represented as

(1)

(2)

(3)

(4)

16. Variation of square of current i^2 with time t is plotted in the graph shown in figure for a resistor of resistance 10 Ω. Total heat produced in the resistance in time 6 s is

(1) 80 J   (2) 240 J

(3) 160 J   (4) 320 J

17. In the circuit shown in figure, the resistance of voltmeter is 6 kΩ. The voltmeter reading will be
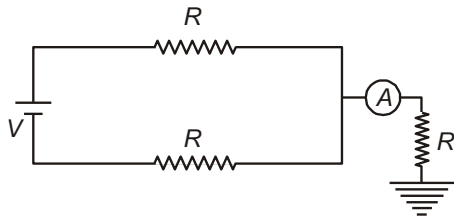

(1) 6 V   (2) 5 V

(3) 4 V   (4) 3 V

18. The value of R for which power across AB is maximum

(1) 6 Ω   (2) 9 Ω

(3) 12 Ω   (4) 3 Ω

19. A 4 V battery with negligible internal resistance is connected across a uniform wire AB of length 2 m. A battery of emf 2 V and internal resistance 2 Ω is joined as shown in figure. If galvanometer shows no deflection, then

(1) $xy > 110$ cm   (2) $xy < 100$ cm

(3) $xy = 100$ cm   (4) $xy = 110$ cm

20. Consider an infinite ladder network as shown in the figure. The effective value of resistance between point A and B is

(1) $4R$ (2) R

(3) $2R$ (4) $8R$

21. Within electric cell, the charge is transported by

(1) Free electrons

(2) Only positive ions

(3) Only negative ions

(4) Both positive and negative ions

22. As shown in figure, two bulbs each 100 W, 220 V connected in series. The heat generated per second when connected in series across 400 V supply is approximately

(1) 50 W   (2) 100 W

(3) 200 W   (4) 165 W

23. The charge flowing through a resistance of 10 Ω varies with time t as $Q = 6t - 3t^2$. The total heat produced is

(1) 60 J   (2) 90 J

(3) 30 J   (4) 120 J

24. A resistance $3R$ of thermal coefficient of resistivity α is connected in parallel with a resistance $6R$ having thermal coefficient 2α, the equivalent thermal coefficient of resistivity is

(1) 3α (2) $\dfrac{4\alpha}{3}$

(3) $\dfrac{3\alpha}{2}$ (4) $\dfrac{5\alpha}{4}$

25. The reading of ammeter in the circuit shown in the figure is

(1) Zero

(2) $\dfrac{2V}{3R}$

(3) $\dfrac{V}{3R}$

(4) $\dfrac{V}{2R}$

26. The charge on the capacitor in the circuit, as shown in the figure, in steady state is
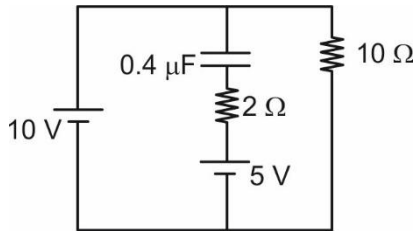
(1) $4\,\mu C$

(2) $5\,\mu C$

(3) $2\,\mu C$

(4) $1\,\mu C$

27. Current (i) through a conductor depends on time (t) as $i = (5t)$ A. If the resistance of the conductor is $2\,\Omega$, then the heat dissipated by the conductor in time duration $t = 2$ s to $t = 4$ s is approximately

(1) 812 J

(2) 16 J

(3) 1500 J

(4) 933 J

28. The equivalent resistance between A and B in the following circuit is

(1) 20 Ω

(2) 3.6 Ω

(3) 4 Ω

(4) 1.2 Ω
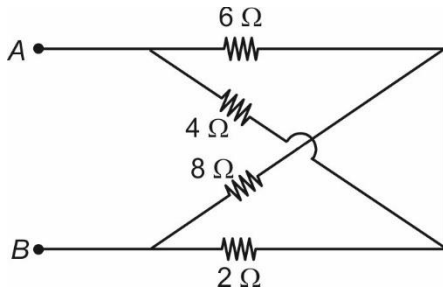
29. The value of current i as shown in the following circuit is
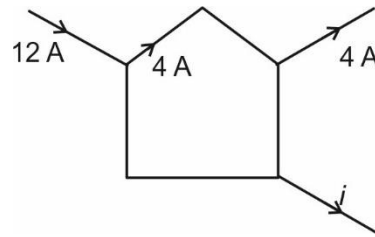
(1) 4 A

(2) 2 A

(3) Zero

(4) 8 A

30. Five identical cells each of internal resistance 0.4 Ω and emf 4 V are connected in series (in support of each other) with an external resistance 2Ω. The current through the external resistance is

(1) 2 A

(2) 10 A

(3) 5 A

(4) 4 A

31. Consider the following circuit diagram involving a potentiometer. The potential gradient across the potentiometer wire is 2 V/m. Calculate the distance AJ, for which the ammeter shows zero deflection.
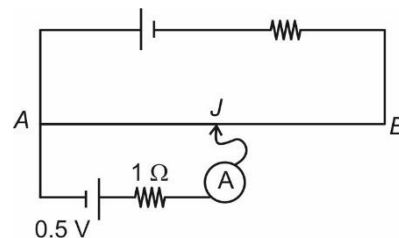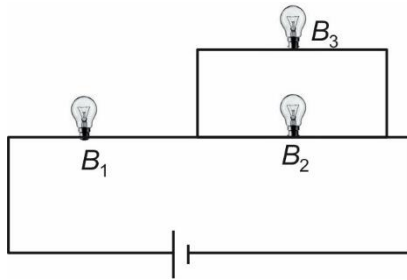

(1) 0.25 m

(2) 0.5 m

(3) 1 m

(4) None of the above

32. Which of the following graphs best represents the variation of terminal potential difference across a cell as function of current through it, in case of charging?
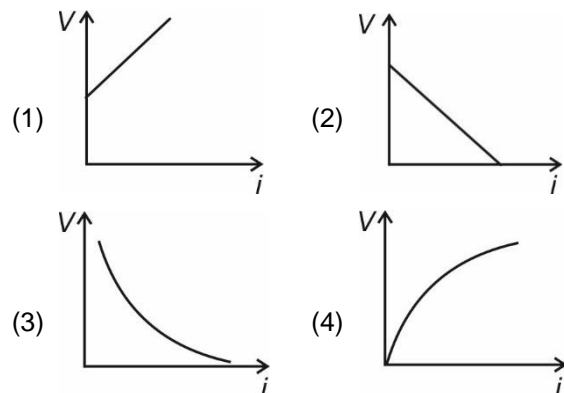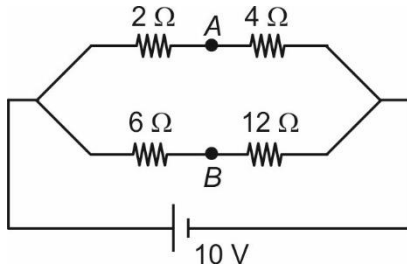
33. Three identical bulbs are connected in a circuit as shown in figure. Rank the bulbs in decreasing order of brightness.

(1) $B_1 > B_2 > B_3$
(2) $B_2 > B_1 > B_3$
(3) $B_1 > B_2 = B_3$
(4) $B_2 = B_3 > B_1$

34. A battery of emf 10 V is connected to resistances as shown in the figure. The potential difference between points A and B is
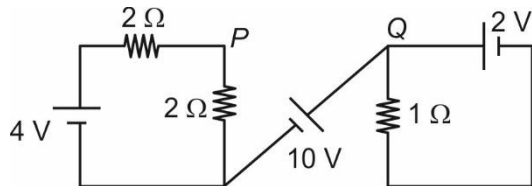

(1) 5 V
(2) 3 V
(3) 6 V
(4) Zero

35. For a conductor of constant volume, the graph between resistance and length of the conductor is
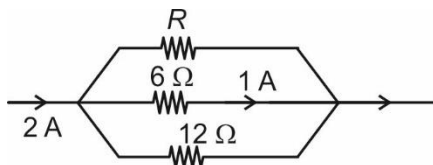
(1) Parabola
(2) Hyperbola
(3) Ellipse
(4) Straight line

SECTION-B

36. The potential difference between points P and Q in the circuit shown in the figure is

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

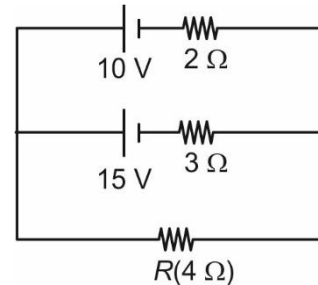37. In the given circuit, the value of resistance of resistor R is

(1) 18 Ω
(2) 6 Ω
(3) 12 Ω
(4) 24 Ω

38. Two bulbs A and B are respectively rated as (25 W – 220 V) and (100 W – 220 V). The ratio of resistance of bulb A to that of bulb B i.e. $R_A : R_B$ is

(1) 1 : 4
(2) 4 : 1
(3) 16 : 1
(4) 1 : 16

39. The current through the load resistance R in the circuit as shown in the figure is

(1) $\dfrac{30}{13}$ A
(2) $\dfrac{30}{7}$ A
(3) $\dfrac{6}{83}$ A
(4) $\dfrac{7}{20}$ A

40. The relaxation time of electrons in conductors

(1) Decrease with decrease in temperature
(2) Decrease with increase in temperature
(3) Is independent of temperature
(4) First increase then decrease with increase in temperature

41. In a neutral wire carrying electric current density $\vec{J}$ is given by (ρ_- is negative charge density, $\vec{v}$ is drift velocity)

(1) $\vec{J} = \rho_- \vec{v}$
(2) $\vec{J} = \dfrac{\vec{v}}{\rho_-}$
(3) $\vec{J} = \dfrac{\rho_-}{\vec{v}}$
(4) Both (2) and (3)

42. Equivalent resistivity of two wires of equal radii and of resistivities ρ_1 and ρ_2 and length l_1 and l_2 respectively joined in series, is

(1) $\dfrac{\rho_1 l_1 + \rho_2 l_2}{l_1 + l_2}$
(2) $\dfrac{\rho_1 l_2 + \rho_2 l_1}{l_1 - l_2}$
(3) $\dfrac{\rho_1 l_2 + \rho_2 l_1}{l_1 + l_2}$
(4) $\dfrac{\rho_1 l_1 - \rho_2 l_2}{l_1 - l_2}$

43. Figure shows a 2.0 V cell connected in a potentiometer used for determination of internal resistance of 1.5 V cell. The balance point of the cell in open circuit is 76.0 cm. When a resistor of 9.0 Ω is used in the external circuit of the cell, the balance point shifts to 72.0 cm length of potentiometer wire. The internal resistance of the cell is

(1) 0.2 Ω (2) 0.3 Ω

(3) 1.7 Ω (4) 0.5 Ω
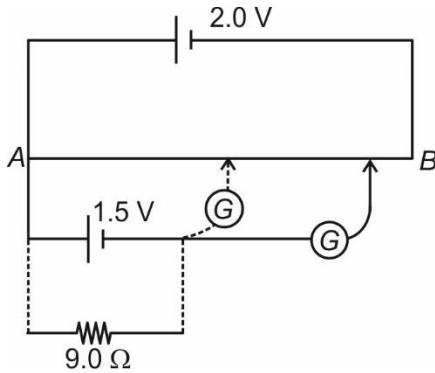
44. A cell has an emf of 4 V and internal resistance 0.6 Ω. The maximum power which it can deliver to any external resistor is

(1) 2.86 W   (2) 6.67 W

(3) 4.87 W   (4) 4.13 W

45. A galvanometer of resistance $G = 50\,\Omega$ is connected to a battery 3 V along a resistance of 2950 Ω in series. A full scale deflection of 30 divisions is obtained in the galvanometer. In order to reduce this deflection to 20 divisions, the resistance R that should be connected in series with G will be

(1) 4450 Ω (2) 5050 Ω

(3) 5550 Ω (4) 6050 Ω

46. Value of current i in the following circuit is
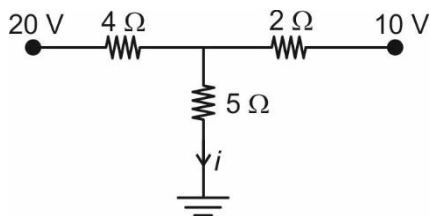
(1) $\dfrac{4}{43}$ A   (2) 16 A

(3) $\dfrac{6}{91}$ A   (4) $\dfrac{40}{19}$ A

47. Mobility of free electrons in a conductor, in presence of external electric field E is μ. If the external electric field changed to $2E$, then mobility will be

(1) 2μ (2) μ

(3) 3μ (4) $\dfrac{\mu}{2}$

48. A cell of emf E and internal resistance r is connected in series with an external resistance nr. The terminal potential difference across the cell will be

(1) $\dfrac{E}{n+1}$ (2) $\dfrac{E}{n}$

(3) $\dfrac{(n+1)E}{n}$ (4) $\left(\dfrac{n}{n+1}\right)E$

49. The equivalent resistance between points A and B in the infinite ladder circuit is
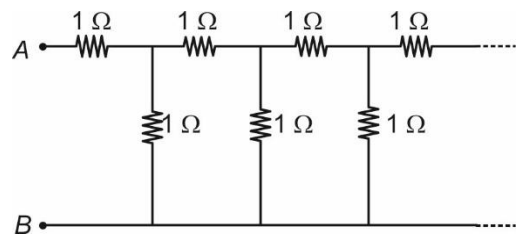
(1) $\dfrac{\sqrt{5}+1}{2}\,\Omega$ (2) $\dfrac{\sqrt{5}-1}{2}\,\Omega$

(3) $3\,\Omega$ (4) $\sqrt{5}\,\Omega$

50. Effective temperature coefficient of series combination of two resistors with respective temperature coefficient of resistance α_1 and α_2 is (The resistance of two conductors at 0°C is same)
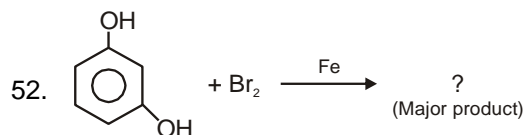
(1) $2(\alpha_1 + \alpha_2)$

(2) $\dfrac{\alpha_1\alpha_2}{\alpha_1 + \alpha_2}$

(3) $\dfrac{\alpha_1 - \alpha_2}{2}$
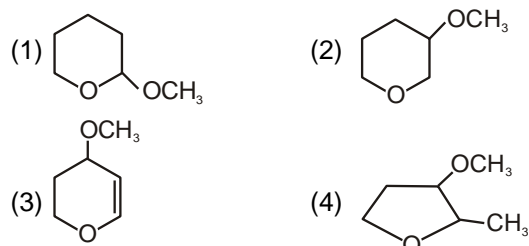
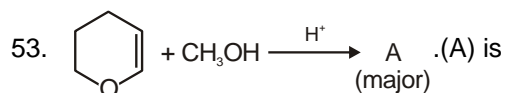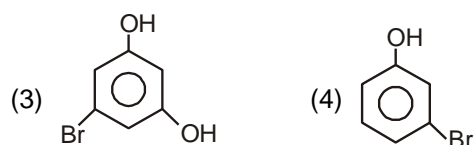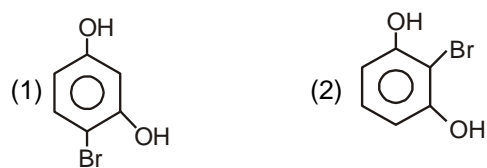(4) $\dfrac{\alpha_1 + \alpha_2}{2}$

CHEMISTRY

SECTION-A

51. Epoxyethane reacts with ethylmagnesium bromide, followed by hydrolysis, the compound formed is
    (1) Isopropyl alcohol
    (2) n-butyl alcohol
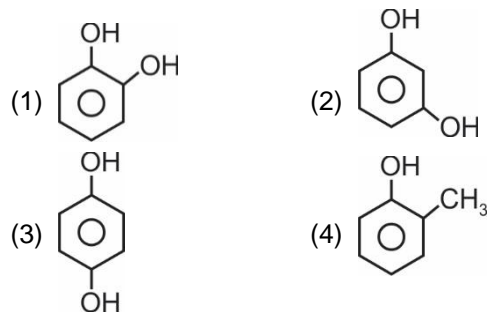   (3) Tert butyl alcohol
    (4) n-propyl alcohol

52.

Major product is

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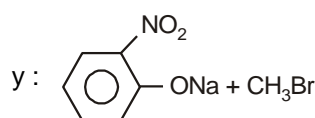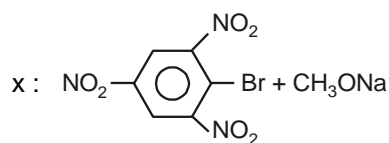(2)
(3)
(4)

53.

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

54. When C_2H_5MgI is made to react with acetone and the addition product is hydrolysed, we get
    (1) A primary alcohol
    (2) A secondary alcohol
    (3) A tertiary alcohol
    (4) An ether

55. Which among the following is resorcinol?

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

56. Which of the reactants given below is/are suitable for the preparation of 1-methoxy-2-nitrobenzene?

x :

y :

(1) Only x
(2) Only y
(3) Both x and y
(4) Neither x nor y

57. Most acidic compound among the following is

(1)
(2)
(3)
(4)
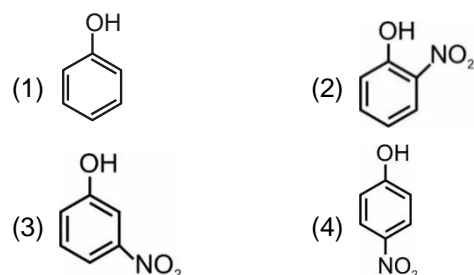
58. Which of the following will be dehydrated most easily in acidic medium?

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

59. Choose the **incorrect** match.

(1) : 4-Methylcyclohex-3-en-1-ol

(2) : 4-Chloro-3-methylpent-3-en-5-ol

(3) : 4-Chlorobut-3-en-2-ol

(4) : Cyclohex-2-en-1-ol

60. $CH_3CH = CH_2$

$\xrightarrow{H_3O^+}$ A (Major)

$\xrightarrow[\text{(ii) } H_2O_2/OH^-]{\text{(i) } BH_3/THF}$ B (Major)

Product A and B are related as

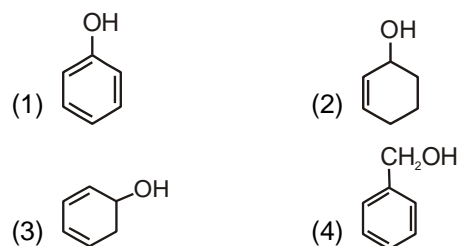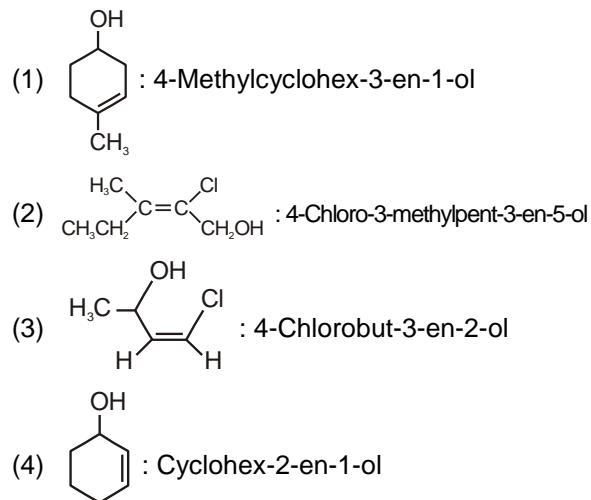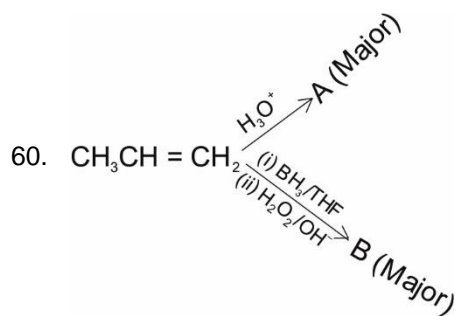(1) Chain isomers   (2) Stereoisomers

(3) Functional isomers   (4) Position isomers

61. In which of the following, product will be racemic mixture?

(1) $\xrightarrow[\text{Alcohol}]{NaBH_4}$

(2) $CH_3 - \overset{O}{\overset{||}{C}} - CH_2CH_3 \xrightarrow[\text{Alcohol}]{NaBH_4}$

(3) $\xrightarrow[\text{(Raney nickel)}]{Ni-H_2}$

(4) $CH_3CHO \xrightarrow[\text{Alcohol}]{NaBH_4}$

62. $\xrightarrow[\text{THF}]{BH_3} A \xrightarrow{H_2O_2/OH^-} B$

Identify the compound B.

(1)

(2)

(3)

(4)

63. $\xrightarrow[\text{(ii) Zn, } H_2O]{\text{(i) } O_3 \text{ (2 equivalents)}} X \xrightarrow[H^+]{KMnO_4} Y \xrightarrow[\text{(major)}]{\Delta} Z$
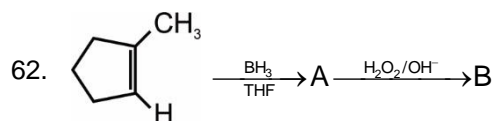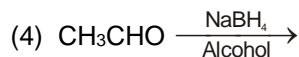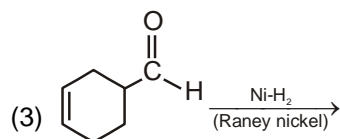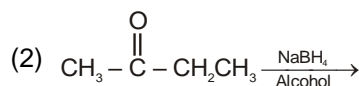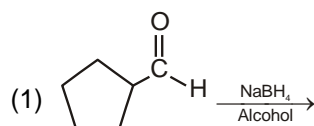
Z is

(1) CH_3CHO (2) CH_3COOH

(3) C_2H_5CHO (4) C_2H_5COOH

64. Identify the chemical reaction in which tert-butylmethylether is formed as the major product.

(1) $CH_3O^- Na^+ + (CH_3)_3C - Br \xrightarrow{\text{Dry ether}}$

(2) $(CH_3)_2CH - O^-K^+ + CH_3 - Br \xrightarrow{\text{Dry ether}}$

(3) $(CH_3)_3C - O^-K^+ + H_3C - Br \xrightarrow{\text{Dry ether}}$

(4) $CH_3CH_2 - O^- Na^+ + (CH_3)_2CH - Br \xrightarrow{\text{Dry ether}}$

65. Identify the most stable carbocation involved in following conversion

$H_3C - \overset{OH}{\underset{CH_3}{\overset{|}{C}}} - \overset{OH}{\underset{CH_3}{\overset{|}{C}}} - CH_3 \xrightarrow{H^+} H_3C - \overset{O}{\overset{||}{C}} - \overset{CH_3}{\underset{CH_3}{\overset{|}{C}}} - CH_3 + H_2O$
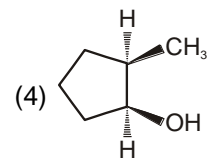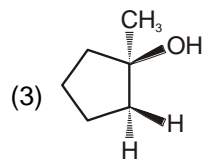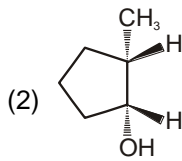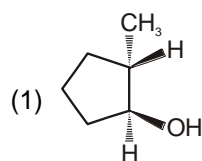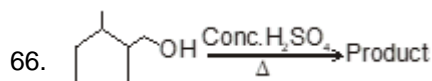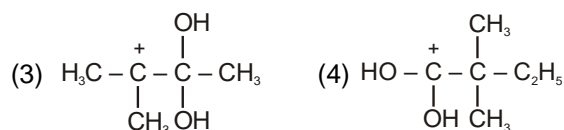
(1) $H_3C - \overset{+}{\underset{CH_3}{\overset{|}{C}}} - \overset{OH}{\underset{CH_3}{\overset{|}{C}}} - CH_3$

(2) $H_3C - \overset{CH_3}{\underset{CH_3}{\overset{|}{C}}} - \overset{OH}{\overset{|}{\underset{+}{C}}} - CH_3$

(3) $H_3C - \overset{+}{\underset{CH_3}{\overset{|}{C}}} - \overset{OH}{\underset{OH}{\overset{|}{C}}} - CH_3$

(4) $HO - \overset{+}{\underset{OH}{\overset{|}{C}}} - \overset{CH_3}{\underset{CH_3}{\overset{|}{C}}} - C_2H_5$

66. $\xrightarrow[\Delta]{\text{Conc.} H_2SO_4}$ Product
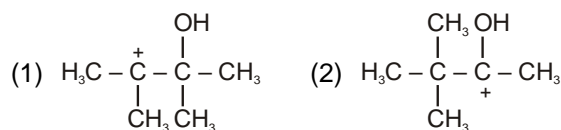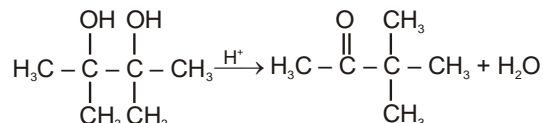
Which of the following will not form in the above reaction?

(1)   (2)

(3)   (4)
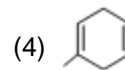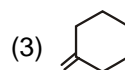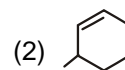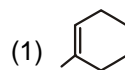
67. Given reaction, $C_2H_5Br + NaOH \rightarrow C_2H_5OH + NaBr$ is called

(1) Electrophilic substitution

(2) Nucleophilic substitution

(3) Electrophilic addition

(4) Nucleophilic addition

68. How many isomers of $C_5H_{11}OH$ will be primary alcohol? (excluding stereoisomers)

(1) 2   (2) 3

(3) 4   (4) 5

69. HI reacts fastest with

(1) 2-methyl propan-2-ol

(2) Propan-2-ol

(3) Propan-1-ol

(4) 2-methyl propan-1-ol

70. The compound which will react with aqueous KOH at fastest rate is

(1) OH

(2) OH

(3) CH_2-OH

(4) OH
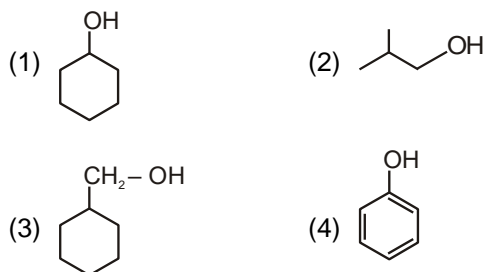
71. Which among the following compounds is most easily dehydrated in acidic medium?

(1) OH

(2) OH

(3) OH

(4) OH

72. Consider the following reaction

 $\xrightarrow[\text{(ii) PhCH}_2\text{Br}]{\text{(i) NaOH}}$ P (Major)

Product P is

(1)

(2)

(3)

(4)
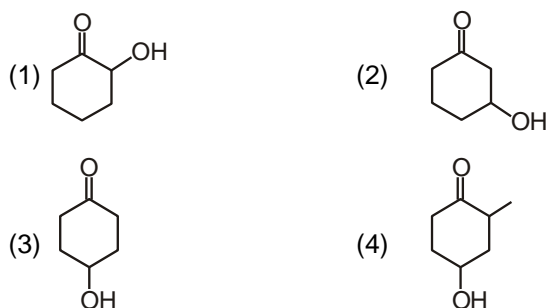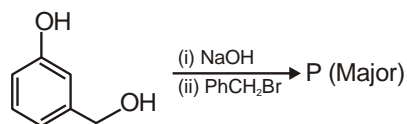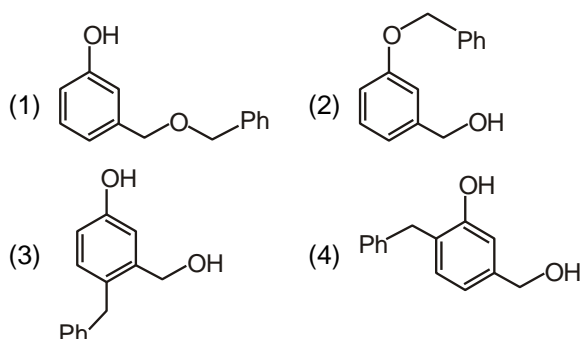
73. When anisole is treated with one equivalent HI, the products formed are

(1) and CH_3OH

(2) and CH_3OH

(3) and CH_3I

(4) and C_2H_5OH
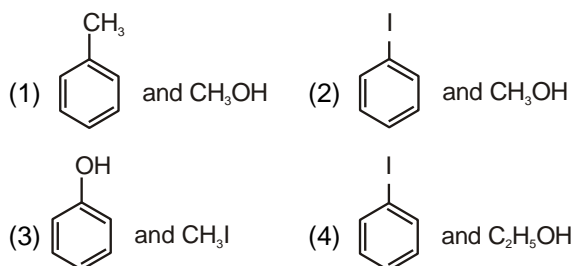
74. Which among the following compounds does not liberate hydrogen gas on reaction with sodium?

(1) OH

(2) OH

(3) OH

(4)
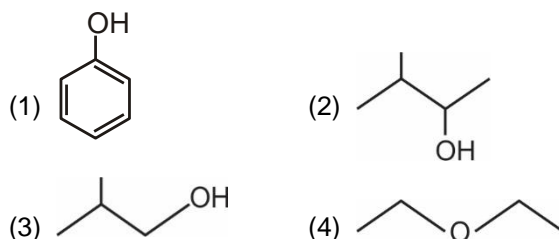
75. The compound which will give iodoform test is
(1) Methanol
(2) Ethanol
(3) Propan-1-ol
(4) 2-methylpropan-2-ol
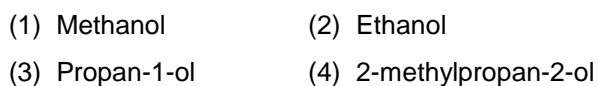
76. The incorrect statement for methoxymethane (X) and ethanol (Y) is
(1) X and Y are functional isomers
(2) X and Y have same boiling point
(3) X is polar aprotic solvent
(4) Y shows intermolecular H-bonding

77. Benzenediazonium chloride on warming with water gives

(1) Cl

(2) NH_2

(3) Cl OH

(4) OH
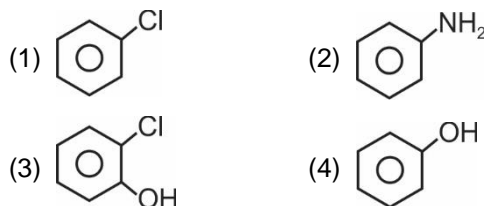
78. Fermentation of glucose in presence of Zymase gives
(1) CH_3OH
(2) CH_3OCH_3
(3) CH_3COOH
(4) CH_3CH_2OH

79. The decreasing order of boiling point of the following compounds is
(I)   Butan-1-ol
(II) Tert-butyl alcohol
(III) Diethyl ether
(1) II > I > III
(2) I > III > II
(3) I > II > III
(4) III > I > II

80. Glycerol reacts with $KHSO_4$ to produce
(1) Dihydroxy glycerine
(2) Acrolein
(3) Glyceraldehyde
(4) Formic acid

81. $\xrightarrow[\Delta]{H_2SO_4}$ Product(s), Major product

is

(1)

(2)

(3)

(4)
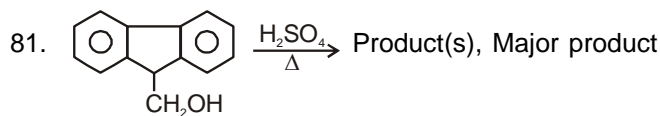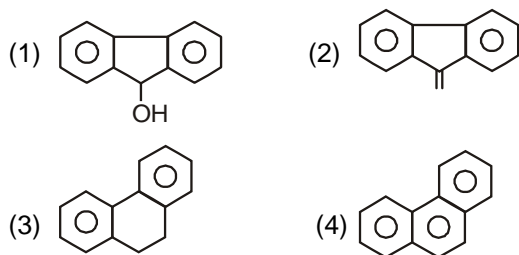
82. Phenol on reaction with CCl_4 in presence of NaOH will produce

(1) Picric acid

(2) Salicylaldehyde

(3) Salicylic acid

(4) Benzoic acid

83.

(A)   (B)   (C)
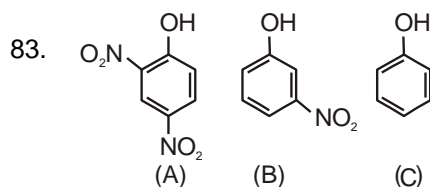
The order of the C–O bond lengths among these compounds is

(1) (A) > (B) > (C)

(2) (C) > (B) > (A)

(3) (B) > (A) > (C)

(4) (C) > (A) > (B)

84.
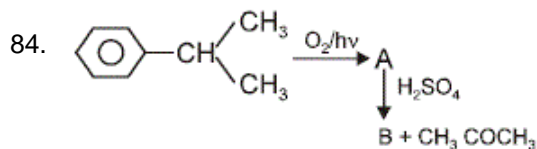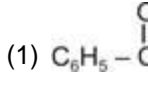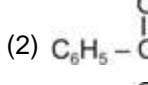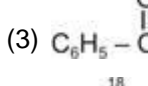
A and B respectively are

(1)

(2)

(3)

(4)
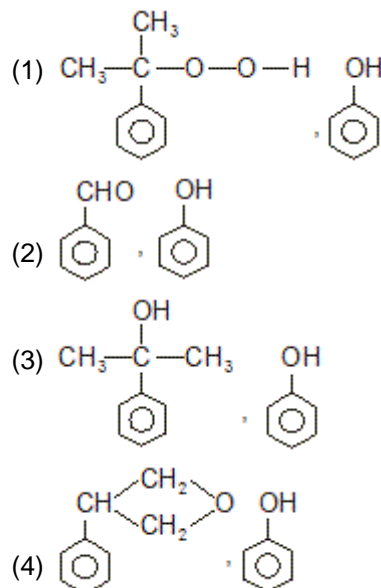
85. The products formed in the reaction are

$$C_6H_5 - \overset{O}{\underset{||}{C}} - OH + CH_3\overset{18}{O}H \xrightarrow[\text{Heat}]{H_2SO_4}$$

(1) $C_6H_5 - \overset{O}{\underset{||}{C}} - \overset{18}{O}CH_3$ and H_2O

(2) $C_6H_5 - \overset{O}{\underset{||}{C}} - OCH_3$ and $H_2\overset{18}{O}$
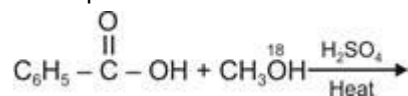
(3) $C_6H_5 - \overset{O}{\underset{||}{C}} - CH_2OH$ and H_2O

(4) $C_6H_5\overset{18}{O}CH_3$, CO and H_2O

SECTION-B

86. In the reaction
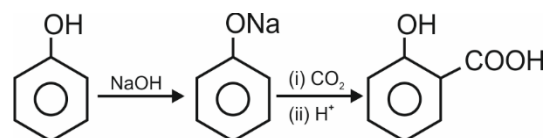
The electrophile involved is

(1) CO_2

(2) CO

(3) H^+

(4) $\overset{+}{C}OOH$

87. The heating of benzyl methyl ether with HI produces majorly

(1) Benzyl iodide and methanol

(2) Benzyl alcohol and iodomethane

(3) Benzyl alcohol and methanol

(4) Benzyl iodide and methane

88. In a given reaction
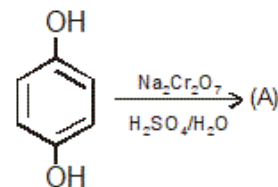
Which of the following is correct option about (A)?

(1) (A) contains 5 membered ring

(2) (A) does not show tautomerism

(3) (A) is carboxylic acid

(4) (A) is an aromatic compound

89. Consider the reactions.

a. $CH_3-CH=CH_2 \xrightarrow[\text{(ii) } H_2O_2/OH^-]{\text{(i) } BH_3/THF} A \xrightarrow[\text{(in } CH_2Cl_2)]{PCC} B$

b. $CH_3-CH=CH_2 \xrightarrow[\text{(ii) } NaBH_4, \overline{O}H]{\text{(i) } Hg\,(OAc)_2} C \xrightarrow[\text{(in } CH_2Cl_2)]{PCC} D$
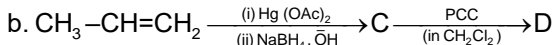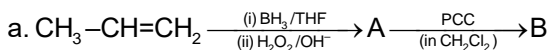
Product B and D are related as

(1) Functional isomers (2) Positional isomers

(3) Chain isomers (4) Metamers

90. Ethanol with acetic anhydride gives

(1) Methyl acetate (2) Methyl propionate

(3) Ethyl propionate (4) Ethyl acetate

91. Which among the following alcohols will give red colour in Victor Meyer test?

(1) $(CH_3)_2CHOH$ (2) $(CH_3)_3COH$

(3) C_6H_5OH (4) CH_3CH_2OH

92. Which of the following compounds reacts with sodium bicarbonate?

(1) Phenol (2) Ethanol

(3) Acetylene (4) Picric acid

93. The reaction of Lucas reagent is fastest with

(1) CH_3—OH (2) CH_3CH_2OH

(3) $(CH_3)_2CHOH$ (4) $(CH_3)_3COH$

94. The order of reactivity of following alcohols with acetic acid in the presence of H^+ ion towards ester formation is

(i) ⬡—OH

(ii) ⬡—CH_2OH

(iii) ⬡ with CH_3 and OH
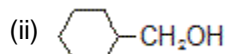
(1) (ii) > (i) > (iii) (2) (ii) > (iii) > (i)

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

95. The correct IUPAC name of the following compound (with H_3C, CH_3, —OC_2H_5 on cyclohexane) is
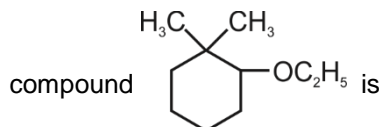
(1) 1-Ethoxy-2,2-dimethylcyclohexane

(2) 2-Ethoxy-1,1-dimethylcyclohexane

(3) 1-Ethoxy-6,6-dimethylcyclohexane

(4) 6-Ethoxy-1,1-dimethylcyclohexane

96. All of the following are correct/valid for ethers, except

(1) They generally have low boiling points

(2) They are less soluble in water

(3) The R-O-R bond angle in ethers is large (>110°)

(4) Solubility of ethers in water increases with increase in molar mass

97. Neutral $FeCl_3$ gives purple colour with

(1) CH_3OH (2) CH_3CH_2OH

(3) phenol (OH on benzene) (4) benzyl alcohol (CH_2OH on benzene)

98. Consider the reaction

$CH_3(CH_2)_8CH_2OH \xrightarrow{CrO_3-H_2SO_4} A$
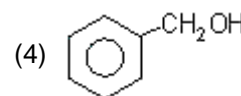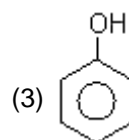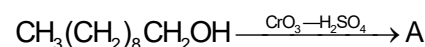
A is

(1) $CH_3(CH_2)_8CHO$ (2) $CH_3(CH_2)_8COOH$

(3) $CH_3CO(CH_2)_7CH_3$ (4) $HOOC(CH_2)_8COOH$

99. Which of the following is not the possible product of dehydration of (cyclohexane with CH(OH)CH$_3$) in acidic medium?

(1) cyclohexane with vinyl group

(2) cyclohexane with =CH group

(3) cyclohexene with ethyl group

(4) cyclohexene with ethyl group
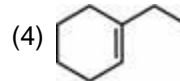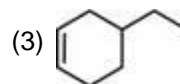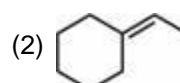
100. Consider the following reaction sequence

$Propan-1-ol \xrightarrow{SOCl_2} X \xrightarrow[\Delta]{alc.KOH}$

$Y \xrightarrow[\text{(ii) } H_2O_2/NaOH]{\text{(i) } B_2H_6/THF} Z(Major)$
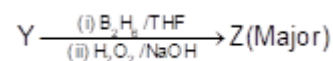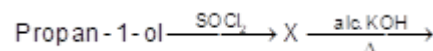
product Z is

(1) CH_3CH_2COOH (2) $CH_3CH_2CH_2OH$

(3) $CH_3CH_2OCH_3$ (4) $CH_3CH(OH)CH_3$

BOTANY

101. Due to non-disjunction, an extra copy of a chromosome is observed in an individual. It is

    (1) Monosomy   (2) Nullisomy

    (3) Trisomy   (4) Tetrasomy

102. Sickle cell anaemia

    a. Is an example of transversion mutation.

    b. Is caused by mutation of the gene which synthesise the β chain of haemoglobin.

    c. Involves replacement of amino acid valine by glutamic acid.

    The **correct** ones are

    (1) All a, b and c   (2) a and c

    (3) a and b   (4) b and c

103. Identify the disorder on the basis of given features of a male

    a. Development of breast

    b. Small testes

    c. Sterility

    d. Feminine piched voice

    (1) Turner's syndrome

    (2) Haemophilia

    (3) Klinefelter's syndrome

    (4) Myotonic dystrophy

104. A woman with normal vision marries a man who is colourblind. If their son is with normal vision then what percentage of their daughter will be colourblind?

    (1) 100%   (2) 0%

    (3) 75%   (4) 25%

105. Which one is a physical mutagen?

    (1) Nitrous acid   (2) Acridine

    (3) X-rays   (4) 5-Bromouracil

106. Mendel experimented on garden pea for

    (1) Six years   (2) Fourteen years

    (3) Ten years   (4) Seven years

107. In which of the following organisms, sperm will decide the sex of progenies?

    (1) *Drosophila*   (2) Birds

    (3) Moths   (4) Butterfly

108. Chromosome complement of an individual inflicted with Klinefelter's syndrome is

    (1) 45 + XY   (2) 44 + XXY

    (3) 44 + XO   (4) 45 + XO

109. Graphical representation to calculate the probability of all possible genotypes of offsprings in a genetic cross was given by

    (1) R.C. Punnett   (2) G.J. Mendel

    (3) Bateson   (4) Johannsen

110. In grasshopper, the male sex in progeny is decided by

    (1) Ova with (A + X) genotype

    (2) Sperm with (A + X) genotype

    (3) Sperm with (A + O) genotype

    (4) Sperm with (A + Z) genotype

111. Mark the **incorrect** pair

    (1) Sickle cell anaemia – Autosomal recessive trait

    (2) Colourblindness – X-linked recessive trait

    (3) Phenylketonuria – Autosomal recessive trait

    (4) Thalassemia – Shows criss-cross inheritance

112. Most frequent skin colour seen in a human population is

    (1) Dark

    (2) Fairly light

    (3) Very light

    (4) Intermediate skin colour

113. Trisomy **cannot** be associated with

(1) Increase in number of chromosomes

(2) Non-disjunction of chromosomes

(3) Triple fusion

(4) Aneuploidy

114. What percentage of offsprings would have genotype AabbCcDd if parents are AaBbccDd and AAbbCcDD?

(1) 25   (2) 6.25

(3) 12.5   (4) 0.625

115. Term recombination was proposed by

(1) Morgan   (2) Sturtevant

(3) Mendel   (4) Hugo de Vries

116. A classical example of point mutation in human is

(1) Colourblindness   (2) Sickle cell anaemia

(3) Phenylketonuria   (4) Haemophilia

117. Total number of different phenotypes in F_2 generation in a typical Mendelian dihybrid cross is

(1) 8   (2) 16

(3) 3   (4) 4

118. Select the **wrong** statement regarding mutations.

(1) Frame-shift mutation may be due to deletion or insertion of one or more bases in a nucleotide chain

(2) When a purine base is substituted by another purine base then it is transition mutation

(3) Transfer of gene segment during crossing over between homologous chromosome results in chromosomal aberration

(4) Many chemical and physical factors can be mutagens

119. In human beings, which of the following disorders occur due to the dominant allele?

(1) Sickle cell anaemia   (2) Cystic fibrosis

(3) Myotonic dystrophy   (4) Haemophilia

120. Which of the following traits is expressed only in homozygous condition in pea plant?

(1) Tall height

(2) Violet flower

(3) Green pod

(4) Terminal flower position

121. One of the reasons for adopting garden pea for experiment by Mendel was

(1) Flowers show cross pollination naturally

(2) It is a leguminous plant

(3) It is a dicot plant

(4) It has many distinct alternative traits

122. Study the given pedigree chart and select the statement which is **true** for this family.

(1) The trait is X–linked recessive

(2) All the unaffected individuals in generation Q are heterozygous for that trait

(3) This pedigree chart can explain the inheritance of myotonic dystrophy

(4) The trait in this pedigree chart is Y-linked

123. How many different types of gametes will be produced by the organism with genotype PpQQrrssTt?

(1) 8   (2) 4

(3) 32   (4) 9

124. Term 'X-body' was given by

(1) Henking   (2) Stevens

(3) Carl Correns   (4) A.H. Sturtevant

125. Select the option in which the combination will result Turner's Syndrome

(1) Egg (22 + 0) × sperm (22 + 0)

(2) Egg (21 + X) × sperm (22 + Y)

(3) Egg (22 + XX) × sperm (22 + 0)

(4) Egg (22 + X) × sperm (22 + 0)

126. Some feature of *Drosophila* are given below

(a) Males are smaller than females

(b) It has a short life cycle

(c) It has smaller number of morphologically distinct chromosomes

(d) It is found over ripe fruits.

Which features are considered suitable for experimental genetics?

(1) (a), (c) and (d)   (2) (b) and (c)

(3) (b), (c) and (d)   (4) (a) and (c)

127. In honey bee males are

(1) Diploid

(2) Infertile

(3) Parthenogenetically produced

(4) Produced by worker bees

128. In garden pea, gene controlling starch synthesis is related to all of the given phenomenon, **except**

(1) Pleiotropy

(2) Incomplete dominance

(3) Codominance

(4) Complete dominance

129. Which one is a test cross?

(1) TT x TT   (2)   tt x tt

(3) Tt x TT   (4)   Tt x tt

130. Mark the statement **incorrect** for chromosomal theory of inheritance.

(1) Both chromosomes and genes retain their number and individuality throughout the life of an organism

(2) Chromosomes are carriers of Mendelian factors which segregate and assort independently during meiosis

(3) The two alleles of a gene pair are located on homologous sites of non-homologous chromosomes

(4) A gamete carries only one chromosome of a type and one of two alleles of a gene

131. A woman has AB blood group. She marries to a man with blood group B whose mother had blood group O. Calculate the probability of their child to be with blood group AB.

(1) $\dfrac{1}{2}$ (2) $\dfrac{1}{4}$

(3) $\dfrac{1}{8}$ (4) $\dfrac{1}{16}$

132. Which of the following symptoms is **not** in a person suffering with Down's syndrome?

(1) Furrowed tongue

(2) Short stature

(3) Palm crease

(4) Gynaecomastia

133. Genes responsible for eye and body colour in *Drosophila* are present on

(1) Two different autosomes

(2) The same chromosome

(3) An autosome and a X-chromosome respectively

(4) Both X and Y-chromosomes

134. Butterfly is different from grasshopper as each somatic cell of the former has

(1) Only one sex chromosome in male individual

(2) Two sex chromosomes in female individual

(3) Only one sex chromosome in female individual

(4) Only autosomes in male individual

135. Which one of the following Mendelian disorders is concerned with below given pedigree chart?
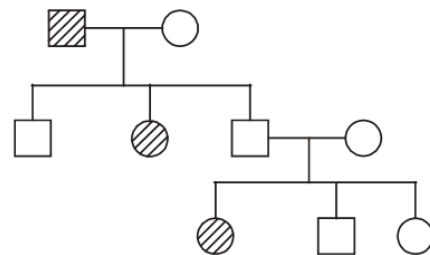
(1) Colour blindness   (2) Haemophilia

(3) Cystic fibrosis   (4) Myotonic dystrophy

SECTION-B

136. Select the **odd** one w.r.t. dominant traits of pea.

(1) Green pod colour

(2) Green seed colour

(3) Inflated pod shape

(4) Round seed shape

137. How many true-breeding pea plant varieties were selected by Mendel?

(1) 7   (2) 36

(3) 14   (4) 24

138. In a dihybrid cross of Mendel's experiment, what will be the proportion of plants which are homozygous only for one trait in F_2 generation?

(1) 1/4   (2) 1/2

(3) 1/16   (4) 1/8

139. According to the concept of dominance, the modified allele is equivalent to the unmodified allele when

   (1) It produces normal enzyme

   (2) It produces the same phenotype

   (3) It produces non-functional enzyme

   (4) Both (1) and (2)

140. Mark the **odd** one w.r.t. pleiotropy.

   (1) It is due to effect of the gene on two or more inter-related metabolic pathways

   (2) In humans, its example is phenylketonuria

   (3) It occurs in human beings only

   (4) Pleiotropic gene affects several characters simultaneously

141. Select the **incorrect** statement w.r.t incomplete dominance.

   (1) Genotypic and phenotypic ratios are the same in F_2 generation

   (2) Test cross can produce two phenotypes

   (3) Phenotype of F_1 hybrid resembles both the parents

   (4) Flower colour in *Antirrhinum majus* is the example of this phenomenon

142. Choose the example of codominance

   (1) Phenylketonuria

   (2) Flower colour in 4O' clock plant

   (3) AB blood group in human

   (4) Skin colour in human

143. Which of the given crosses will produce maximum possible phenotypes in offsprings?

   (1) AABb × aabb   (2) AABB × aabb

   (3) AaBb × aabb   (4) AaBB × aabb

144. Which of the following can express themselves in both F_1 and F_2 generation in a monohybrid cross?

   (1) Green seeds   (2) Violet flower colour

   (3) Terminal flowers   (4) Yellow pods

145. Relationship between Mendelian factors and chromosomes was found by

   (1) Sutton and Boveri

   (2) Morgan and Sturtevant

   (3) Bateson and Punnett

   (4) Johannsen

146. Proportion of recombinant phenotypes in F_2 generation in Mendelian dihybrid cross is

   (1) $\dfrac{6}{16}$ (2) $\dfrac{3}{16}$

   (3) $\dfrac{9}{16}$ (4) $\dfrac{10}{16}$

147. In Mendel's hybridization experiment, Rr × rr gives rise to the progeny in the genotypic ratio of

   (1) 2 : 1   (2) 1 : 1

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

148. In the following statements

   Statement-A : Dominance is not an autonomous feature of gene

   Statement-B : Mendelian dihybrid test cross will have same genotypic and phenotypic ratio

   (1) Statement A is incorrect

   (2) Statement B is incorrect

   (3) Statements A and B both are correct

   (4) Statements A and B both are incorrect

149. When a cross is made between red flowered and white flowered snapdragon plants, the percentage of offsprings having pink and white flowers respectively in F_2 generation will be

   (1) 25% and 50%   (2) 50% and 25%

   (3) 50% and 0%   (4) 25% and 0%

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

	Column I		Column II
a.	Alleles	(i)	A single gene exhibiting more than one phenotypic expression.
b.	Genes	(ii)	The units of inheritance
c.	Pleiotropy	(iii)	Forms of a gene which codes for a pair of contrasting traits.
d.	Multiple allelism	(iv)	Presence of more than two alleles for a gene

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

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

ZOOLOGY

151. Which of the following statements is **'incorrect'** about 'Saheli'?

    (1) It is once a week pill

    (2) It is non-steroidal preparation

    (3) It checks ovulation

    (4) Its chemical compound is centchroman

152. If a person is suffering from male infertility due to very few sperms in the ejaculate, the technique adopted for assistance in reproduction is

    (1) ZIFT   (2) GIFT

    (3) AI   (4) IVF

153. Medical termination of pregnancy is considered safe up to how many weeks of pregnancy?

    (1) 6 weeks   (2) 12 weeks

    (3) 20 weeks   (4) 8 weeks

154. The most effective contraceptive method in males is

    (1) IUDs

    (2) Oral contraceptive pills

    (3) Vasectomy

    (4) Periodic abstinence

155. Contraceptive method that is generally advised for the females as a terminal method to prevent any more pregnancies is

    (1) Vasectomy   (2) Tubectomy

    (3) Oophorectomy (4) Hysterectomy

156. IUD is an effective and popular contraceptive method. Select the option which is an example of non-medicated IUD?

    (1) LNG-20   (2) Lippes loop

    (3) Multiload 375 (4) Cu7

157. Amniocentesis is the insertion of a needle through the abdominal and uterine walls into the amniotic cavity to withdraw fluid for the examination of certain defects. Which of the following **cannot** be diagnosed by this method?

    (1) Turner's syndrome   (2) Cleft lip

    (3) Klinefelter syndrome (4) Cystic fibrosis

158. In which method of contraception, does the couple abstain from coitus during fertile period

    (1) IUDs

    (2) Coitus interruptus

    (3) Periodic abstinence

    (4) Lactational amenorrhea

159. Oral contraceptive pills generally contain combination of two hormones. Which of the following factors are affected by them?

    a. Secretion of gonadotropins

    b. Follicular development and ovulation

    c. Quality of cervical mucus

    Select the **correct** option.

    (1) a only   (2) a and b only

    (3) b and c only   (4) a, b and c

160. Select the hormone releasing IUDs.

    (1) CuT   (2) Cu7

    (3) Progestasert   (4) Multiload 375

161. Voluntary termination of pregnancy

    (1) Is relatively unsafe before first trimester than after 2nd trimester

    (2) Is to get rid of unwanted pregnancies due to unprotected intercourse.

    (3) Is always surgical and is effective only within 72 hours of coitus

    (4) Requires confirmation by two qualified registered medical practitioner before three months

162. Match the following and choose the **correct** option.

Column-I		Column-II
a. ZIFT	(i)	Transferring of ovum and sperm into oviduct of female
b. IUT	(ii)	Early embryo (up to 8-blastomeres) is transferred into fallopian tube
c. GIFT	(iii)	Embryo with more than eight blastomeres is transferred into uterus
d. ICSI	(iv)	Sperm directly injected into the ovum

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

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

163. Which one is **not** applicable for Multiload 375?

    (1) Suppresses sperm motility

    (2) Promotes phagocytosis of sperms within uterus

    (3) Copper ions reduce the fertilizing capacity of sperms

    (4) Inhibits ovulation

164. Select the **incorrect** statement.

    (1) Infertility is a condition in which female is unable to conceive even after two years of unprotected sexual cohabitation

    (2) $\dfrac{1}{5}$ of all pregnancies *i.e.* 45–50 million pregnancies are aborted per year all over the world

    (3) Trichomoniasis is a fungal STI

    (4) In IVF-ET, embryo upto 8-celled stage is transferred into fallopian tube

165. Factor which **did not** contribute to increase in population size of India during last few decades is

    (1) Decline in death rate

    (2) Increase in maternal mortality rate (MMR)

    (3) Decline in infant mortality rate (IMR)

    (4) Increase in number of people in reproducible group

166. Select the **mismatch** w.r.t. function of contraceptives.

    (1) Oral contraceptive pills – Prevent ovulation

    (2) Barrier methods – Prevent physical meeting of gametes

    (3) Lactational amenorrhoea – Prevents lactation

    (4) Vasectomy – Prevents gamete transport

167. *In-vitro* fertilization and ET is a technique that involves transfer of which one of the following into the fallopian tube?

    (1) Only embryo up to eight-celled stage

    (2) Zygote or early embryo up to eight celled stage

    (3) Only zygote

    (4) Only embryo more than 32 celled stage

168. Action of which hormone is blocked by the use of mifepristone?

    (1) hCG   (2) Progesterone

    (3) FSH   (4) LH

169. All of the following STIs are curable if detected early and treated properly, **except**

    (1) Genital warts   (2) Chlamydia

    (3) Chancroid   (4) Genital herpes

170. Choose the **correct** match.

    (1) Syphilis   – *Haemophilus ducrei*

    (2) Genital warts   – *Treponema pallidum*

    (3) AIDS   – Human Papilloma Virus

    (4) Malaria   – *Plasmodium vivax*

171. In case of a female who suffers from anovulation but has normal physiological conditions suitable for carrying out fertilization and embryonic development; the preferred ART should be

    (1) ZIFT   (2) GIFT

    (3) ET   (4) ICSI

172. Lactational amenorrhoea is due to the high level of

    (1) Follicle stimulating hormone

    (2) Luteinizing hormone

    (3) Prolactin

    (4) Progesterone

173. Syphilis, a bacterial STI, is

    (1) Preventable by using non-medicated IUDs

    (2) Communicable from an infected mother to the developing foetus across the placenta

    (3) Characterized by painful chancres on external genitals which have necrotic basis

    (4) Incurable at all stages in an affected human

174. Steroidal oral contraceptive pills are consumed by females

    (1) Only on the day of ovulation

    (2) Continuously for 21 days starting within 1st five days of menstruation

    (3) Only during follicular phase of menstrual cycle

    (4) Once a week for first 4 months

175. In an ART, the ova collected from a donor is transferred into the fallopian tube. This technique is __X__ and the fertilisation is then taking place __Y__.

Choose the **correct** option w.r.t. 'X' and 'Y'

	X	**Y**
(1)	ZIFT;	*in vitro*
(2)	IUT;	*in vitro*
(3)	AI;	*in vivo*
(4)	GIFT;	*in vivo*

176. Which of the following oral contraceptive pill is progesterone only pill?
(1) Mala D
(2) Saheli
(3) POPs
(4) Orthonovum

177. Which of the following statement is **wrong** about test tube baby?
(1) Fusion of sperm and ovum is done outside the body of female
(2) The zygote or early embryo up to eight blastomeres is transferred into the fallopian tube
(3) The embryo more than eight blastomeres is transferred into the uterus
(4) Gamete Intra Fallopian Transfer is one of the method included in this programme

178. Select the correct pair among the following given options w.r.t. methods of contraception.

(1) Natural methods	–	Periodic abstinence, coitus interruptus
(2) Barrier methods	–	Multiload 375, vault
(3) Intra uterine device	–	Implants, Lippes' loop
(4) Sterilization methods	–	Castration, vasectomy

179. __A__ alone or in combination with __B__ can be used by females as injections or small silicon devices under the skin as effective contraceptives. Choose the option that fill the blanks correctly.
(1) A-FSH, B-LH
(2) A-Estrogen, B-LH
(3) A-Progestogen, B-Estrogen
(4) A-LH, B-Inhibin

180. If vas deferens of both sides are cut and ligated in a mature human male, then all of the following may be observed except
(1) Continuation of male sex hormone secretion
(2) Semen is without sperms
(3) Transport of sperms to ejaculatory duct is blocked
(4) Increase in sperm count

181. Though all persons are vulnerable to STIs but their incidences are reported to be very high among persons of age group
(1) 40-50 years
(2) 15-24 years
(3) 35-40 years
(4) 5-10 years

182. According to 2011 census report, the population growth rate in India was _____ percent.
(1) More than 3
(2) More than 6
(3) Less than 2
(4) More than 4

183. Which of the following is possibly the most widely accepted method of contraception in India?
(1) IUDs
(2) Femidoms
(3) Coitus interruptus
(4) Rhythm method

184. Among the given contraceptives, which one has minimum average failure rate?
(1) Calendar method
(2) Barrier method
(3) Withdrawal method
(4) Oral contraceptive

185. A correct statement regarding the type of birth control called implant
(1) Allows ovulation but does not allow fertilisation
(2) Makes cervical mucus thin in consistency
(3) Effective only for short duration i.e., few months
(4) Retards entry of sperms in female genital tract

SECTION-B

186. The family planning programme in India was initiated in year
(1) 1972
(2) 1951
(3) 1964
(4) 1981

187. Population growth can be controlled by all except
    (1) Encouraging couples to use contraceptive methods
    (2) Giving incentives to couples with smaller families
    (3) Raising the marriageable age of males and females
    (4) Promoting unprotected sexual co-habitation

188. Read the given statements and select the correct option.

    Statement-A : As long as the mother breast feeds the child fully, chances of conception are almost nil but this is effective only upto six months following parturition.

    Statement-B : Natural methods of contraception work on the principle of non-formation of gametes.

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

189. Which of the following is not used effectively as emergency contraception after coitus?
    (1) IUDs
    (2) Only progestogen pills
    (3) Combined pills
    (4) Only estrogen pills

190. How many of the contraceptives given in the box below does not require expert/nurse intervention for their use or placement?

    Norplant, Injections, Femidom, Nirodh, Foams

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

191. Which one of the following groups include all venereal diseases?
    (1) AIDS, Genital warts, Cholera
    (2) HIV, Malaria, Chlamydiasis
    (3) Gonorrhoea, AIDS, Chlamydiasis
    (4) Haemophilia, Hepatitis, AIDS

192. Select the incorrect match.
    (1) RTIs – Reproductive tract infections
    (2) ART – Assisted reproductive technologies
    (3) PID – Pelvic inflammatory diseases
    (4) RCH – Regional child health care

193. Condoms are not
    (1) Easy to use
    (2) Reusable
    (3) Made up of thin rubber
    (4) Available for females

194. Hormonal intra uterine device does not suppress
    (1) Implantation of blastocyst
    (2) Sperm motility through cervix
    (3) Fertilising capacity of sperms
    (4) Spermatogenesis

195. When did the medical termination of pregnancy act in India got legalised?
    (1) 1984   (2) 1951
    (3) 2002   (4) 1971

196. Opinion of how many registered medical practitioners are required for MTP, if the pregnancy has lasted more than 12 weeks, but fewer than 24 weeks?
    (1) One   (2) Three
    (3) Two   (4) Four

197. All of the following contraceptive methods inhibit ovulation except
    (1) Saheli   (2) Norplant
    (3) Mala-D   (4) Injectable

198. If a female menstrual cycle is of 40 days, then the fertile period in which a couple should avoid coitus is from
    (1) $10^{th} – 17^{th}$ day   (2) $22^{nd} – 29^{th}$ day
    (3) $40^{th} – 47^{th}$ day   (4) $30^{th} – 37^{th}$ day

199. The technique that involves fertilisation of egg outside the female body, followed by its insertion into oviduct is
    (1) GIFT   (2) ZIFT
    (3) AI   (4) IUI

200. Which of the following is used as male contraceptive?
    (1) Diaphragm   (2) Vault
    (3) Lippes' loop   (4) Nirodh

❑ ❑ ❑

MM : 720

REVISION TEST SERIES

Time : 3.00 Hrs.

(*for* NEET-2022)
Test - 2

Answers

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

Answers & Solutions

PHYSICS

SECTION-A

1. Answer (2)

$$R = \frac{V}{I} \propto \cot\theta$$

$R = R_0(1 + \alpha\Delta t)$

Here $\theta_1 > \theta_2$

$\therefore$ $R_1 < R_2$

$T_1 < T_2$

2. Answer (1)

Current will not flow in capacitor branch. Hence there is no potential drop across $3\,\Omega$ resistor.

$\therefore$ Potential across capacitor

$V = 2$ V

$\therefore$ $Q = CV = 10\,\mu\text{F} \times 2\,\text{V} = 20\,\mu\text{C}$

3. Answer (1)

Total voltage drop across both capacitors

$$V = \left(\frac{E}{R+r}\right)R$$

$\therefore$ Voltage across one capacitor

$$= \frac{ER}{2(R+r)}$$

4. Answer (3)

$$\mu = \frac{v_d}{E} = \frac{0.025 \times 2}{100} = 5 \times 10^{-4}\ \text{m}^2\text{V}^{-1}\text{s}^{-1}$$

5. Answer (1)
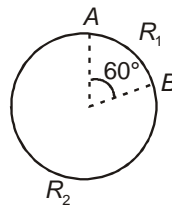
$R_1 + R_2 = 4\,\Omega$

$$R_1 = \left(\frac{60°}{360°}\right)(R_1 + R_2)$$

$$R_1 = \frac{4}{6} = \frac{2}{3}\Omega$$

$$R_2 = 4 - \frac{2}{3} = \frac{10}{3}\Omega$$

$$\therefore\ R_{\text{eq}} = \frac{R_1 R_2}{R_1 + R_2} = \frac{20}{3 \times 12} = \frac{5}{9}\ \Omega$$

6. Answer (1)

Let each resistance is of R

$$R_{PQ} = \frac{5}{11}R$$

$$R_{PR} = \frac{3}{11}R$$

$$R_{QR} = \frac{4R}{11}$$

$\therefore$ R_{PQ} is maximum.

7. Answer (4)

$V_A - 1.5 = V_B$

$\Rightarrow V_A = 1.5 + V_B$

$\Rightarrow V_A = 1.5\text{ V}$

$V_B - 2.5 + 2 = V_D$

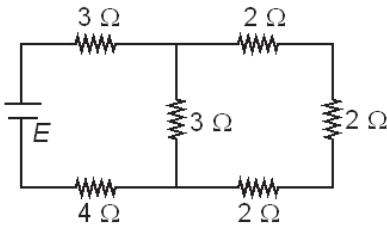$\Rightarrow V_D = 0 - 2.5 + 2 = -0.5\text{ V}$

8. Answer (1)
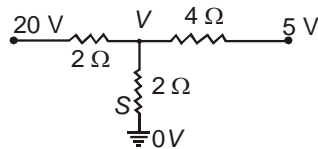
$= \dfrac{20 - V}{2} + \dfrac{5 - V}{4} = \dfrac{V - 0}{2}$

$\therefore V = 9\text{ V}$

$\therefore$ Current through switch
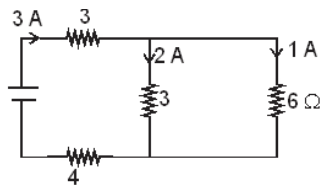
$I = \dfrac{V - 0}{2} = \dfrac{9 - 0}{2} = 4.5\text{ A}$

9. Answer (2)

as voltage drop is 2 V

$2 = i \times 2$

$\Rightarrow i = 1\text{ A}$

$\Rightarrow E = 3 \times 3 + 3 \times 2 + 4 \times 3$

$= 9 + 6 + 12$

$= 27\text{ V}$

10. Answer (1)

$\dfrac{55}{R} = \dfrac{20}{100 - 20} = \dfrac{1}{4}$

$\therefore R = 220\ \Omega$

11. Answer (3)

$V_G - 8 + 3 - 4 + 2 = V_H$

$V_G - V_H = 8 + 2 - 3 = 7\text{ V}$

12. Answer (2)

Let R be the resistance of each resistor.

$R_0 = 3R$

R' be the resistance after closing switch.

$R' = \dfrac{7R}{3}$

$R' = \dfrac{7}{3} \times \dfrac{R_0}{3} = \dfrac{7R_0}{9}$

13. Answer (3)

On increasing the temperature the resistivity of semiconductor decreases while of conductor resistivity increases.

14. Answer (2)

$P_{9\Omega} = \dfrac{V^2}{R} \Rightarrow 36 = \dfrac{V_1^2}{9}$

$V_1 = 18\text{ V}$

$I_{2\Omega} = 2\text{A} + 3\text{A} = 5\text{A}$

$V_{2\Omega} = 2 \times 5 = 10\text{ V}$

15. Answer (3)

$i = \dfrac{dq}{dt}$ = Slope of charge-time graph

$i = -5\text{ A}$

$H = i^2 Rt$

$\Rightarrow H \propto t$

16. Answer (3)

Heat produced

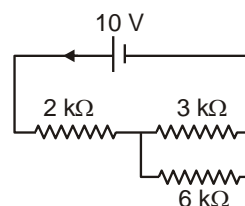$H = \int i^2 R\,dt = R\int i^2\,dt$

$H = R \times$ Area under i^2-t graph

Area $= \dfrac{1}{2} \times (6 + 2) \times 4 = 16$

$\therefore H = 10 \times$ area $= 10 \times 16 = 160\text{ J}$

17. Answer (2)

R_{eq} of 3 kΩ and 6 kΩ = 2 Ω

∴ Potential drop across 2 kΩ will be 5 V and across combinations of 3 kΩ and 6 kΩ would also be 5 V. Hence, reading = 5 V

18. Answer (3)

For maximum power

$R_{eq} = r = 6\ \Omega$
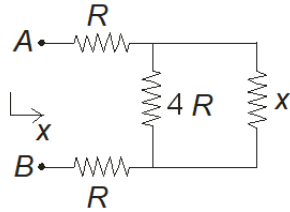
$2R||2R||\ R = 6$

$\dfrac{R}{2} = 6$

$R = 12\ \Omega$

19. Answer (3)

As 4 volt will drop across AB which is 2 m hence for two volt drop $xy = 1$m

20. Answer (1)

Let equivalent resistance between point A and B is X.

$x = 2R + \dfrac{4Rx}{4R+x}$

$\Rightarrow\ 4Rx + x^2 = 8R^2 + 2Rx + 4Rx$

$\Rightarrow\ x^2 - 2Rx - 8R^2 = 0$

$\Rightarrow\ x = \dfrac{2R \pm \sqrt{4R^2 + 32R^2}}{2}$

$\Rightarrow\ x = 4R$

21. Answer (4)

In electric cell, the charge is transported by both the positive and negative ions.

22. Answer (4)

$100 = \dfrac{220^2}{R}$

$P_1 = \dfrac{200^2}{R}$

$\Rightarrow\ P_1 = 82.6$ W

$\Rightarrow$ Total power = 2 × 82.6 = 165.2 W

23. Answer (4)

$Q = 6t - 3t^2$

$i = \dfrac{dQ}{dt} = 6 - 6t$

$i = 0$, at $t = 1$ s

$H = \int i^2 R\, dt = \int_0^1 (6-6t)^2\, 10dt$

$= 360 \int_0^1 (1 + t^2 - 2t)\, dt$

$= 360 \left(1 + \dfrac{1}{3} - 1\right)$

$H = 120$ J

24. Answer (2)

$\dfrac{1}{R_{eq}} = \dfrac{1}{3R} + \dfrac{1}{6R} \Rightarrow R_{eq} = 2R$

$\dfrac{1}{R_{eq}} = \dfrac{1}{R_1} + \dfrac{1}{R_2}$

$-\dfrac{dR_{eq}}{R_{eq}^2} = -\dfrac{dR_1}{R_1^2} - \dfrac{dR_2}{R_2^2}$

$\dfrac{dR_{eq}}{R_{eq}} = \dfrac{R_{eq}}{R_1}\dfrac{dR_1}{R_1} + \dfrac{R_{eq}}{R_2}\dfrac{dR_2}{R_2}$

$dR = R\, \alpha\, d\theta$

$\alpha_{eq}\Delta\theta = \dfrac{2R}{3R}\alpha\Delta\theta + \dfrac{2R}{6R}2\alpha\Delta\theta$

$\alpha_{eq} = \dfrac{2\alpha}{3} + \dfrac{2\alpha}{3} = \dfrac{4\alpha}{3}$

25. Answer (1)

No current will pass through the grounded resistor. Hence reading of ammeter will be zero.

26. Answer (3)

At steady state, no current flows through the capacitive arm
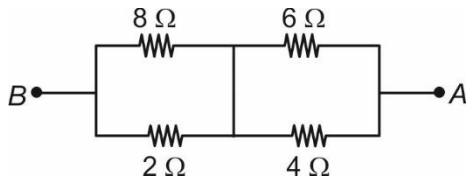
∴ $Q = (10-5) \times 0.4 = 2\ \mu C$

27. Answer (4)

$\int i^2 R\, dt = H \Rightarrow H = \int_2^4 25t^2 \times 2dt$

$H = 50 \left. \dfrac{t^3}{3} \right|_2^4 = 933.33$ J

28. Answer (3)

Simplified circuit diagram :

$$R = \left(\frac{8 \times 2}{8 + 2}\right) + \left(\frac{6 \times 4}{6 + 4}\right)$$

$$R = 4 \ \Omega$$

29. Answer (4)

$i_{incoming} = i_{outgoing}$

$12 = 4 + i \Rightarrow i = 8$ A

30. Answer (3)

$$i = \frac{5 \times E}{5r + R} = \frac{5 \times 4}{5 \times 0.4 + 2} = \frac{20}{2 + 2} = 5\,\text{A}$$

31. Answer (4)

The negative terminal of battery is connected to point A and thus no null point will be obtained.

32. Answer (1)

Terminal potential difference across cell while charging.

$V = E + iR$

So, graph will be a straight line.

33. Answer (3)

If current through B_1 is i, then current through B_3 and B_2 will be $i/2$.

$\therefore \quad B_2 = B_3 < B_1$

34. Answer (4)

Given circuit is like a balanced wheatstone bridge.

$\therefore \quad V_A = V_B$

35. Answer (1)

$$R = \frac{\rho l}{A} = \frac{\rho l}{(V/l)} = \frac{\rho}{V} l^2 \rightarrow \text{Parabola}$$

SECTION-B

36. Answer (4)

Current through $2\,\Omega$ resistor $= \dfrac{4}{4} = 1$ A

$V_P - 2(1) + 10 = V_Q$

$Q_Q - V_P = 8$ V

37. Answer (3)

Let current through $12\,\Omega$ resistor be x

$$12x = 1 \times 6 \Rightarrow x = \frac{1}{2}\,\text{A}$$

Remaining current $i.e.$ $2 - \left(1 + \dfrac{1}{2}\right)$ flows through

$$R = \frac{1}{2}\,\text{A}$$

Now, $\dfrac{1}{2} \times R = 1 \times 6 \Rightarrow R = 12\,\Omega$

38. Answer (2)

$$P = \frac{V^2}{R} \Rightarrow R \propto \frac{1}{P}$$

$$\frac{R_1}{R_2} = \frac{P_2}{P_1} = \frac{100}{25}$$

$$\therefore \quad \frac{R_1}{R_2} = \frac{4}{1}$$

39. Answer (1)

$$E = \frac{\Sigma E_i / r_i}{\Sigma 1 / r_i} = \frac{10/2 + 15/3}{1/2 + 1/3} = \frac{10}{5/6} = 12\,\text{V}$$

$$r_{eq} = \frac{2 \times 3}{2 + 3} = \frac{6}{5}\,\Omega$$

$$i = \frac{12}{\dfrac{6}{5} + 4} = \frac{12}{26/5} = \frac{12 \times 5}{26} = \frac{30}{13}\,\text{A}$$

40. Answer (2)

Relaxation time of electrons in conductors decreases with increase in temperature.

41. Answer (1)

$$\vec{J} = \rho_- \vec{v}$$

42. Answer (1)

$$\frac{\rho(l_1 + l_2)}{A} = \frac{\rho_1 l_1}{A} + \frac{\rho_2 l_2}{A}$$

$$\rho = \frac{\rho_1 \ell_1 + \rho_2 \ell_2}{\ell_1 + \ell_2}$$

43. Answer (4)

Internal resistance of cell is

$$r = \left(\frac{l_1 - l_2}{l_2}\right) \times R = \frac{76 - 72}{72} \times 9 = 0.5\,\Omega$$

44. Answer (2)

Maximum power will be delivered when external resistor = 0.6 Ω

$$\text{Power} = \left(\frac{4}{1.2}\right)^2 \times 0.6 = 6.67 \text{ W}$$

45. Answer (1)

$$I_g = \frac{3}{50 + 2950} = 1 \text{ mA}$$

Now, $I = \frac{2}{3} I_g$

So, $\dfrac{2}{3} = \dfrac{3}{50 + R}$

$R = 4450 \ \Omega$

46. Answer (4)

Let x be then potential of junction point

$$\frac{0-x}{5} + \frac{20-x}{4} + \frac{10-x}{2} = 0 \Rightarrow x = \frac{200}{19}$$

$$\therefore \quad i = \frac{x}{5} = \frac{40}{19} A$$

47. Answer (2)

$$\mu = \frac{v}{E}$$

as $v \propto E$

$\mu \propto E^0$

48. Answer (4)

$$i = \frac{E}{(n+1)r}$$

Now, terminal potential difference across the cell

$$V = E - ir = E - \frac{E}{n+1} = \frac{nE}{n+1}$$

49. Answer (1)

Let equivalent resistance of the circuit between points A and B is x.
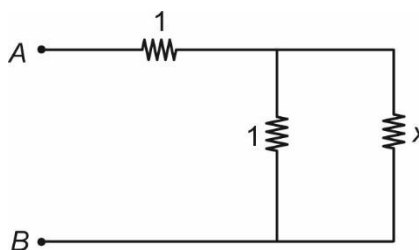
$$\frac{x(1)}{x+1} + 1 = x$$

$\Rightarrow \quad x + x + 1 = x^2 + x$

$\Rightarrow \quad x^2 - x - 1 = 0$

$\Rightarrow \quad x = \dfrac{1 \pm \sqrt{1+4}}{2} = \dfrac{1+\sqrt{5}}{2}$

50. Answer (4)

At any temperature, for series combination

$R = R_1 + R_2$

$2R_0(1 + \alpha T) = R_0(1 + \alpha_1 T) + R_0(1 + \alpha_2 T)$

On solving

$$\alpha = \frac{\alpha_1 + \alpha_2}{2}$$
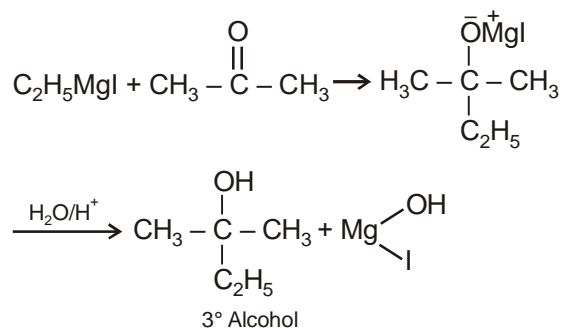
CHEMISTRY

SECTION-A

51. Answer (2)
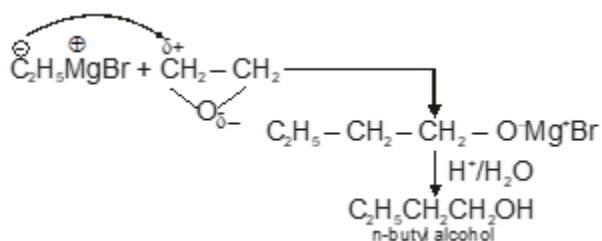
52. Answer (1)

Attack of $Br^\oplus$ will be most favoured on the site where +M effect of both –OH group operates and steric hindrance for the electrophilic attack is least.
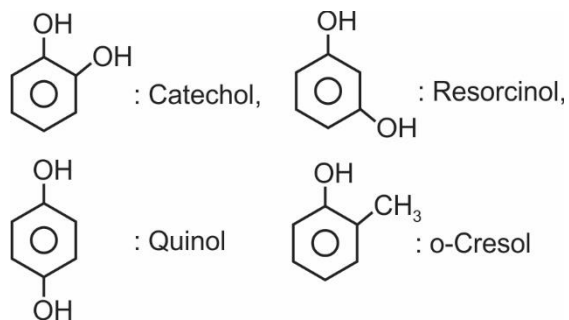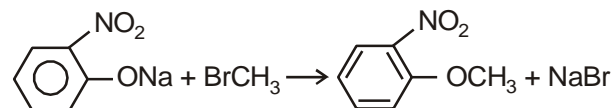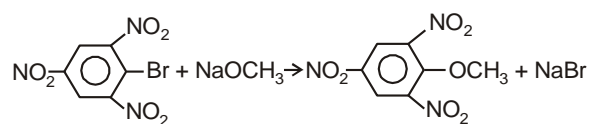
53. Answer (1)

54. Answer (3)

$$C_2H_5MgI + CH_3 - \overset{\overset{O}{\|}}{C} - CH_3 \longrightarrow H_3C - \overset{\overset{\bar{O}\overset{+}{M}gI}{|}}{\underset{\underset{C_2H_5}{|}}{C}} - CH_3$$

$$\xrightarrow{H_2O/H^+} CH_3 - \overset{\overset{OH}{|}}{\underset{\underset{C_2H_5}{|}}{C}} - CH_3 + Mg\overset{OH}{\underset{I}{<}}$$
3° Alcohol

55. Answer (2)

OH / OH : Catechol,   OH / OH : Resorcinol,

OH / OH : Quinol   OH / CH₃ : o-Cresol

56. Answer (2)

NO₂ ... -Br + NaOCH₃ → NO₂ ... -OCH₃ + NaBr

NO₂ ... -ONa + BrCH₃ → NO₂ ... -OCH₃ + NaBr
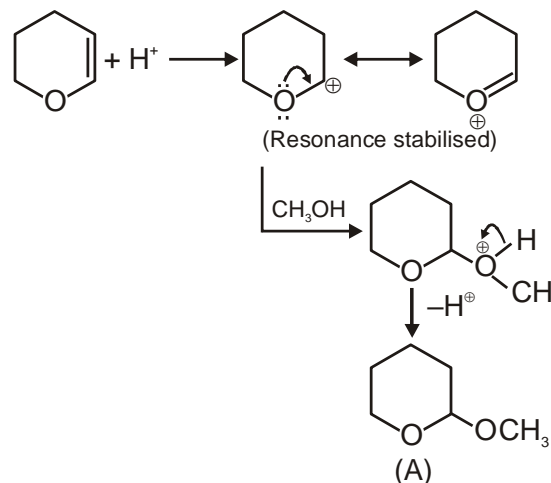
57. Answer (4)

When electron withdrawing group present at ortho or para position then acidic strength increases due to –R effect. Because of hydrogen bonding acidic strength of ortho-nitrophenol decreases slightly.

58. Answer (3)

Those alcohol which give stable product after dehydration, can be dehydrated most easily in acidic medium.
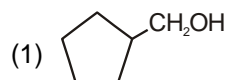
59. Answer (2)

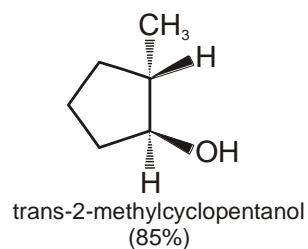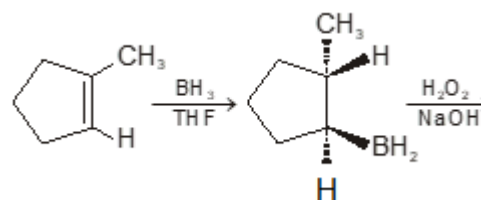The correct name of the compound is 2-chloro-3-methylpent-2-en-3-ol.

60. Answer (4)

A is propan-2-ol

B is propan-1-ol

61. Answer (2)

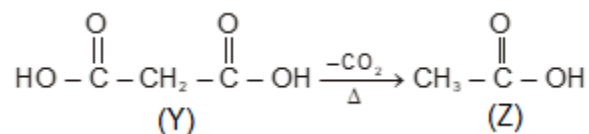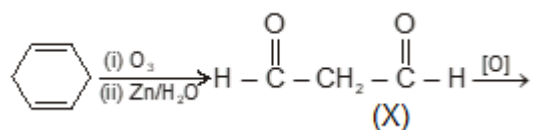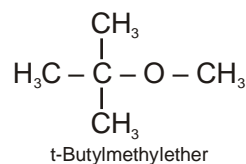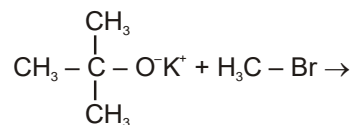(1) ⬠–CH₂OH

(2) $CH_3 - \overset{\overset{OH}{|}}{CH} - CH_2 - CH_3$
(±)-Butan-2-ol (100%)

(3) ⬡–CH₂OH

(4) CH_3CH_2OH

62. Answer (1)

... $\xrightarrow[THF]{BH_3}$ ... $\xrightarrow[NaOH]{H_2O_2}$

trans-2-methylcyclopentanol
(85%)

63. Answer (2)

⬡ $\xrightarrow[\text{(ii) Zn/H}_2\text{O}]{\text{(i) O}_3}$ $H - \overset{\overset{O}{\|}}{C} - CH_2 - \overset{\overset{O}{\|}}{C} - H$ $\xrightarrow{[O]}$
(X)

$HO - \overset{\overset{O}{\|}}{C} - CH_2 - \overset{\overset{O}{\|}}{C} - OH$ $\xrightarrow[\Delta]{-CO_2}$ $CH_3 - \overset{\overset{O}{\|}}{C} - OH$
(Y)   (Z)

64. Answer (3)

$CH_3 - \overset{\overset{CH_3}{|}}{\underset{\underset{CH_3}{|}}{C}} - \bar{O}K^+ + H_3C - Br \rightarrow$

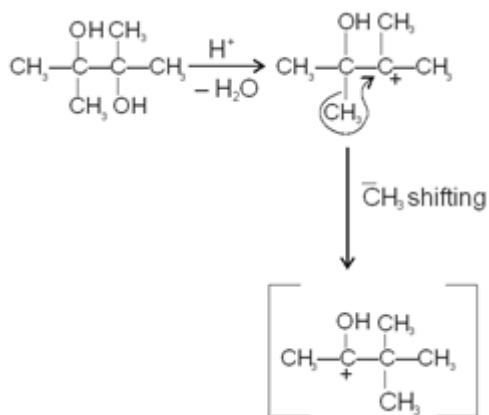$H_3C - \overset{\overset{CH_3}{|}}{\underset{\underset{CH_3}{|}}{C}} - O - CH_3$
t-Butylmethylether
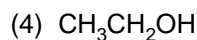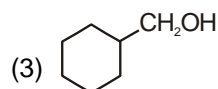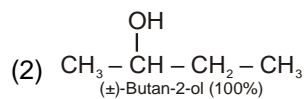
65. Answer (2)

most stable carbocation due to + R effect of –OH group.

66. Answer (4)

Elimination reaction occurs in the presence of conc. H_2SO_4 and only one double bonded species will formed.
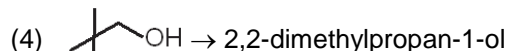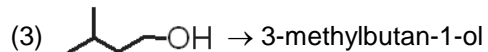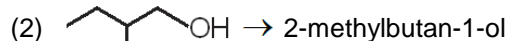
67. Answer (2)

The reaction in which an electron rich nucleophile attacks a positively charged electrophile to replace a learning group is called Nucleophilic substitution reaction.

$$\overset{\delta+}{C_2H_5}-\overset{\delta-}{Br}+\overset{+}{Na}\overset{-}{OH}\rightarrow C_2H_5OH+NaBr$$
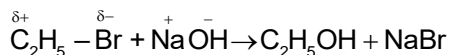
68. Answer (3)

When functional group (–OH) remains attached to primary carbon then it is called as primary alcohol.

(1) → Pentan-1-ol

(2) → 2-methylbutan-1-ol

(3) → 3-methylbutan-1-ol

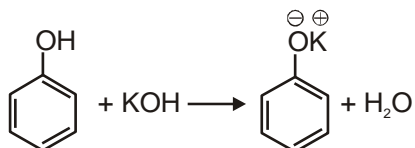(4) → 2,2-dimethylpropan-1-ol

69. Answer (1)
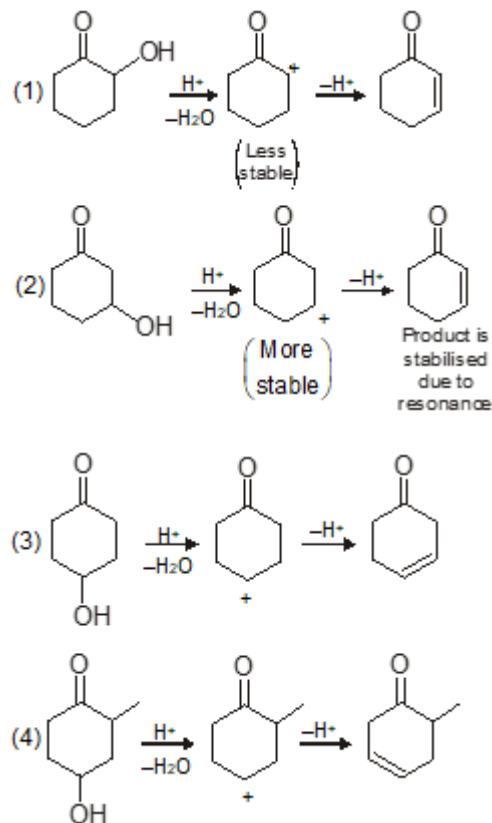
3° alcohols are more reactive with HI.

70. Answer (4)

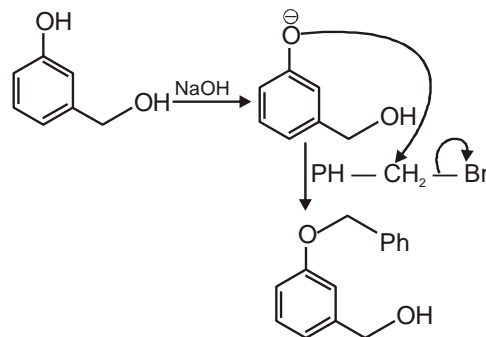Stronger is the acidic strength faster will be the reaction.

71. Answer (2)

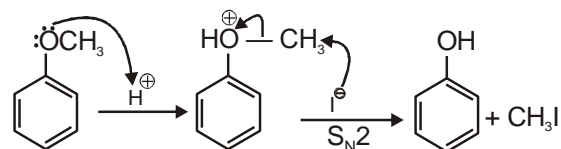The ease of dehydration is decided by the stability of carbonium ion and the product form.

72. Answer (2)

Phenolic hydrogen is easily abstracted by aqueous alkali and phenoxide ion is formed.
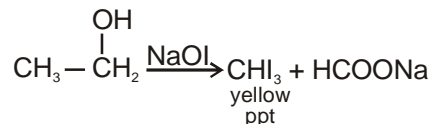

73. Answer (3)

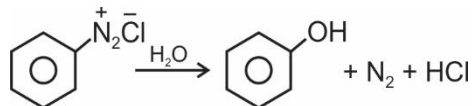

74. Answer (4)

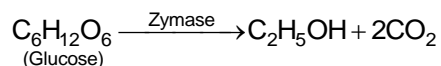Ethers do not react with Na to give H_2 gas.

75. Answer (2)

$$CH_3-\underset{\underset{\displaystyle OH}{|}}{CH_2} \xrightarrow{NaOI} \underset{\underset{\displaystyle ppt}{\underset{\displaystyle yellow}{}}}{CHI_3} + HCOONa$$

76. Answer (2)

Methoxymethane is an ether therefore it has lower boiling point than ethanol.

77. Answer (4)

$$+ N_2 + HCl$$

78. Answer (4)
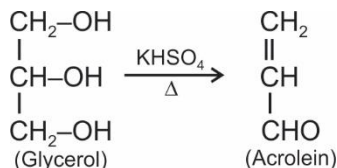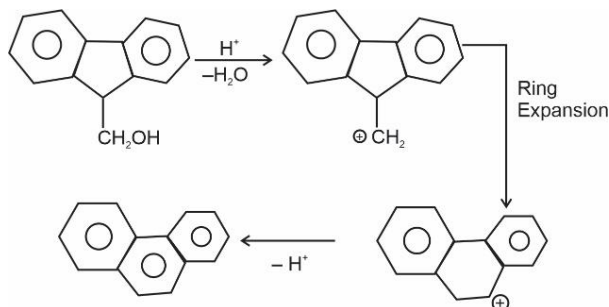
$$\underset{(Glucose)}{C_6H_{12}O_6} \xrightarrow{Zymase} C_2H_5OH + 2CO_2$$

79. Answer (3)

Boiling Point :

$$\underset{118°C}{Butan\text{-}1\text{-}ol} > \underset{82°C}{t\text{-Butyl alcohol}} > \underset{35°C}{Diethyl\ ether}$$
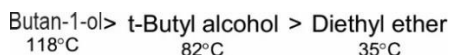
80. Answer (2)

81. Answer (4)

82. Answer (3)

$$C_6H_5OH + CCl_4 \xrightarrow{NaOH}$$
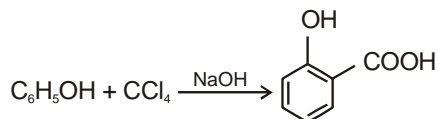
83. Answer (2)

Lesser is the electron density on the ring, greater is the bond order of C–O bond and shorter is the bond length of C–O bond of phenol.

84. Answer (1)

$$+ CH_3COCH_3$$

(B)
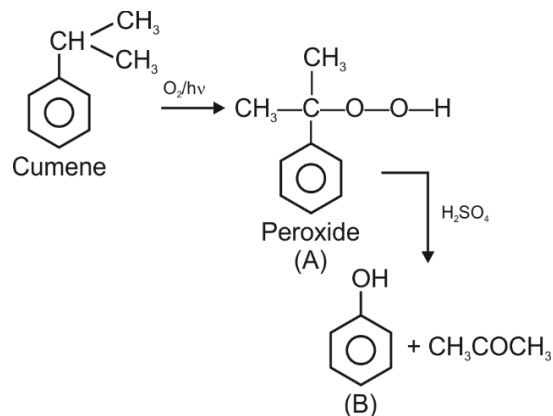
85. Answer (1)

Esterification reaction
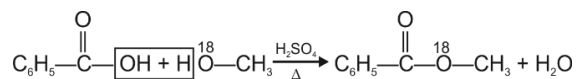
SECTION-B

86. Answer (1)

CO_2 is the electrophile in the given reaction.

87. Answer (1)

The reaction proceeds by S_N1 mechanism.

88. Answer (2)

Oxidation of 1, 4-Dihydroxy benzene.

89. Answer (1)

(a) $CH_3-CH=CH_2 \xrightarrow[\text{(ii) } H_2O_2/OH^-]{\text{(i) } BH_3/THF}$

(b) $CH_3-CH=CH_2 \xrightarrow[\text{(ii) } NaBH_4/OH]{\text{(i) } Hg/(OAc)_2}$
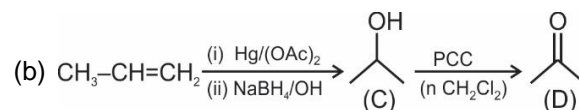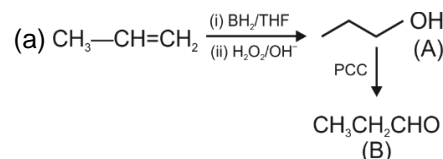
∴ B and D are functional isomers of each other.

90. Answer (4)

91. Answer (4)

1°-alcohol gives red colour in Victor Meyer test.

92. Answer (4)

93. Answer (4)

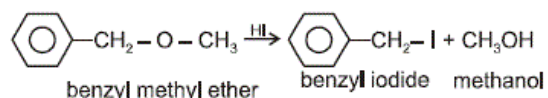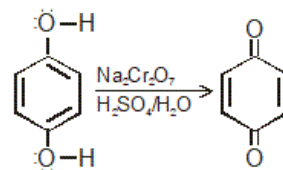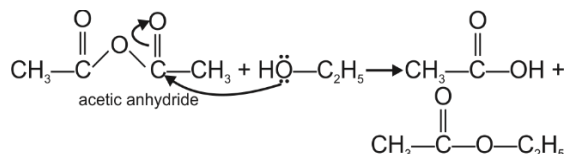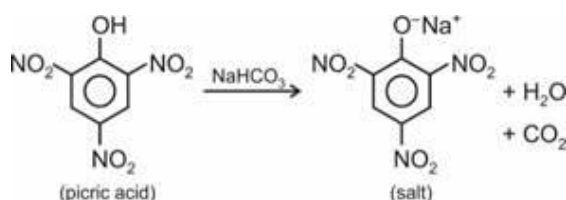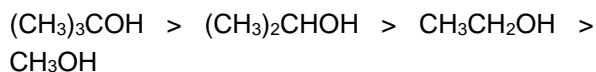More is the stability of carbocation more will be the reactivity of alcohol towards Lucas reagent.

∴ Correct order of reactivity of alcohol towards Lucas reagent is

$(CH_3)_3COH > (CH_3)_2CHOH > CH_3CH_2OH > CH_3OH$

94. Answer (1)

Reactivity of alcohols towards esterification on the basis of steric hindrance is 1° > 2° > 3°.

95. Answer (2)
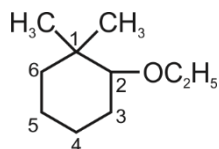
2-Ethoxy-1,1-dimethylcyclohexane

96. Answer (4)

Solubility of ethers in water decreases with increase in molar mass.

97. Answer (3)

When phenol reacts with $FeCl_3$ gives purple colour.

98. Answer (2)

$$CH_3(CH_2)_8CH_2OH \xrightarrow[\text{Jones reagent}]{CrO_3-H_2SO_4} CH_3(CH_2)_8COOH$$
1-Decanol   Decanoic acid
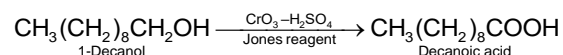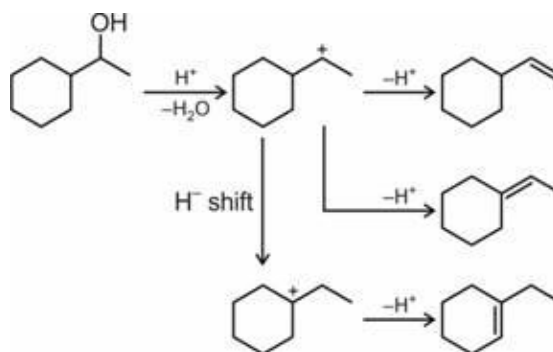
99. Answer (3)

100. Answer (2)
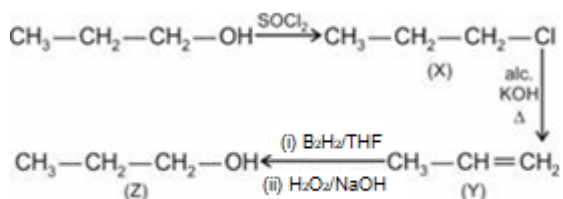
BOTANY

101. Answer (3)

Down's syndrome is an example of non-disjunction. It is failure of two homologous chromosomes to pass to separate cells during first meiotic division, or of the two chromatids of a chromosome to pass to separate cells during mitosis or during the second meiotic division.

Non disjunction results in an embryo with three copies of particular chromosome instead of usual two.

102. Answer (3)

Sickle cell anaemia occurs due to altered amino acid at 6th position of β-chain of globin protein.

It occurs by point mutation *i.e.,* transversion of A by T in DNA which replaces amino acid glutamic acid by valine.

103. Answer (3)

A male individual affected with Klinefelter's syndrome are sterile with overall masculine development and some female characteristics (*e.g.* Feminine pitched voice, development of breast or gynaecomastia).

104. Answer (2)

Genotype of woman = XX

Genotype of man = X^CX

$$XX \;—\!\!\top\!\!—\; X^CY$$

$X^CX \qquad X^CX \qquad XY \qquad XY$

Normal vision
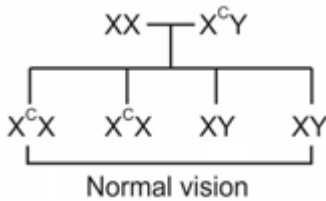
105. Answer (3)

X-rays is a physical mutagen

106. Answer (4)

Mendel experimented on garden pea for seven years.

107. Answer (1)

Drosophila – Males are heterogametic.

Birds and moths – Females are heterogametic.

108. Answer (2)

Chromosome complement of an individual inflicted with Klinefelter's syndrome is 44 + XXY.

109. Answer (1)

R. C. Punnett proposed Punnett square.

110. Answer (3)

Male genotype = AA + XO

Female $\qquad\qquad$ Male

AA + XX $\qquad\qquad$ AA + XO

A + X $\quad$ A + X $\qquad$ A + X $\quad$ A + O

Male progeny = AA + XO

Female progeny = AA + XX

111. Answer (4)

Thalassemia is an autosomal recessive disorder. While crisscross inheritance is shown by X-linked recessive disorder.
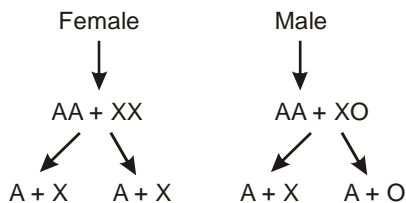
112. Answer (4)

Intermediate phenotypes are frequent in polygenic inheritance.

113. Answer (3)

Trisomy is a type of aneuploidy in which a particular chromosome is three in number.

Triple fusion results triploid condition of endosperm in angiosperm plants.

114. Answer (2)

By the cross between AbBbccDd and AAbbCcDD the probability of

$$Aa = \frac{1}{2}$$

$$bb = \frac{1}{2}$$

$$Cc = \frac{1}{2}$$

$$Dd = \frac{1}{2}$$

∴ Percentage of AabbCcDd $= \dfrac{1}{2} \times \dfrac{1}{2} \times \dfrac{1}{2} \times \dfrac{1}{2} \times 100$

$$= \frac{100}{16} = 6.25$$

115. Answer (1)

Morgan proposed term linkage and recombination.

116. Answer (2)

A classical example of point mutation is sickle cell anaemia.

117. Answer (4)

Four different phenotypes are possible in F_2 generation of a typical Mendelian dihybrid cross.

118. Answer (3)

Loss or gain of segment of DNA or chromosome results in alteration in chromosomes. This results in chromosomal aberration.

119. Answer (3)

Myotonic dystrophy is a dominant autosomal.

120. Answer (4)

Terminal flower position is a recessive trait in pea plant.

121. Answer (4)

Pea plants show self-pollination in nature.

122. Answer (2)

All unaffected individuals in generation Q are heterozygous for the trait and are carriers of trait.

123. Answer (2)

Number of heterozygous locus (n) = 2

Types of gametes = $2^n = 2^2 = 4$

124. Answer (1)

Term "X-body" was given by Henking.

125. Answer (4)

Chromosome compliment in Turner's syndrome is 44 + XO.

126. Answer (2)

Short life cycle and smaller number of morphologically distinct chromosomes in *Drosophila* are suitable characters for experimental genetics.

127. Answer (3)

Honey bee males are haploid and fertile.

128. Answer (3)

Gene controlling starch synthesis in pea shows

(1) Pleiotropy.

(2) Incomplete dominance (Bb form intermediate size starch grains).
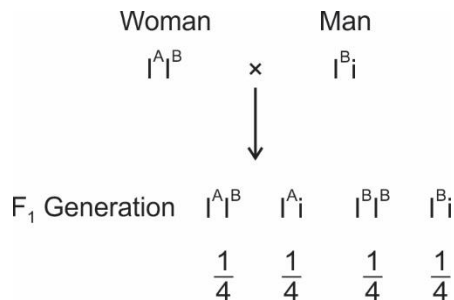
(3) Complete dominance (Bb, seed shape is round).

129. Answer (4)

Tt x tt is a test cross

130. Answer (3)

Alleles of a gene will always be situated on homologous sites of homologous chromosomes.

131. Answer (2)

Probability of getting AB blood group = $\frac{1}{4}$

132. Answer (4)

Klinefelter's male show gynecomastia.

133. Answer (2)

Genes responsible for eye colour and body colour are linked genes and are present on X-chromosome.

134. Answer (3)

In butterfly, sex determination is $\overset{\male}{ZZ} - \overset{\female}{ZO}$.

In grasshopper, sex determination is $\overset{\male}{XO} - \overset{\female}{XX}$.

135. Answer (3)

The inheritance pattern in given pedigree exhibits autosomal recessive trait.

SECTION-B

136. Answer (2)

In pea plant, green seed colour is a recessive trait

Dominant traits are :

Green pod colour.

Full pod shape.

Yellow seed colour.

137. Answer (3)

Initially Mendel took 34 varieties of pea plants then 22 but ultimately worked with only 7 pairs of varieties or 14 true breeding pea plants.

138. Answer (2)

RRYy, rrYy, RrYY and Rryy plants are homozygous for only one trait. They are produced in 2 : 2 : 2 : 2 ratio so their proportion among F_2

population is = $\frac{8}{16} = \frac{1}{2}$

139. Answer (4)

If the modified allele produces non-functional enzyme or no enzyme at all, it will be not equivalent to unmodified allele.

140. Answer (3)

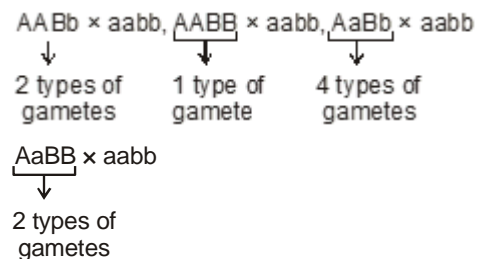Pleiotropy can be observed in different organisms.

141. Answer (3)

Phenotype of hybrid in incomplete dominance is intermediate of the parents.

142. Answer (3)

AB blood group in humans is a good example of codominance.

143. Answer (3)

Since one parent in all given options is aabb (test cross). Thus types of gamete will depend only on 2nd parent.

144. Answer (2)

Violet flower colour is a dominant trait.

145. Answer (1)

Sutton and Boveri found that there is a striking relationship between Mendelian factors and the chromosomes.

146. Answer (1)

Mendelian dihybrid phenotypic ratio is 9 : 3 : 3 : 1, out of which $\frac{9+1}{16}$ is parental proportion $\left(\frac{10}{16}\right)$ and $\frac{3+3}{16}$ is recombinant proportion $\left(\frac{6}{16}\right)$.

147. Answer (2)

Genotypic as well as phenotypic ratio is 1:1 for F_1 generation.

148. Answer (3)

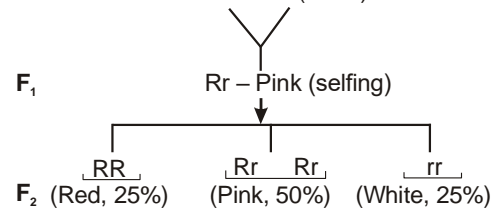Mendelian dihybrid test cross gives 1:1:1:1 as phenotypic as well as genotypic ratio.

149. Answer (2)

F_2 phenotypic ratio in incomplete dominance is

1 : 2 : 1

(Red : Pink : White)

Parents: RR (red) × rr (white)

F_1 Rr – Pink (selfing)

F_2 RR   Rr   Rr   rr
(Red, 25%)   (Pink, 50%)   (White, 25%)

150. Answer (1)

Alleles are two contrasting forms of a gene.

A pleiotropic gene may affect more than one phenotypes.

ZOOLOGY

SECTION-A

151. Answer (3)

Saheli checks implantation.

152. Answer (3)

Male infertility due to low sperm count can be overcome by AI.

153. Answer (2)

MTP is safe up to first trimester of pregnancy.

154. Answer (3)

Vasectomy is most effective method of contraception because male gametes are not part of the ejaculate released into the female reproductive system. In vasectomy, vas deferens is cut and the two ends are ligated.

155. Answer (2)

In tubectomy fallopian tubes are cut and tied.

156. Answer (2)

Cu 7 and multiload 375 are IUDs which releases copper ions that increase phagocytosis of sperms. LNG-20 is also an example of medicated IUD which releases progesterone.

157. Answer (2)

Genetic defects and biochemical defects are diagnosed by amniocentesis.

158. Answer (3)

In menstrual cycle, chances of fertilisation are higher from day (10-17) in a fertile female. The absence of copulation during this period is known as periodic abstinence/rhythm method/calendar method.

159. Answer (4)

Higher concentration of estrogen and progesterone during luteal phase give negative feedback to hypothalamus, thereby inhibiting the release of GnRH from hypothalamus and LH, FSH from pituitary

160. Answer (3)

CuT, Cu7 and Multiload 375 are copper releasing IUDs.

161. Answer (2)

Indian government legalised MTP in 1971.

162. Answer (1)

Embryo more than 8 blastomers are transferred into uterus (IUT) and less than 8 blastomeres are transferred into fallopian tube (ZIFT).

163. Answer (4)

Oral pills inhibit ovulation and implantation.

164. Answer (3)

Trichomoniasis is caused by protozoa *Trichomonas vaginalis.*

165. Answer (2)

Increase in MMR can lead to decline in population size.

166. Answer (3)

During lactation, plasma concentration of prolactin increases which acts as GnRH inhibitor, preventing follicular development and ovulation resulting into amenorrhoea, named lactational amenorrhoea.

167. Answer (2)

In IVF, zygote or embryo upto 8 celled stage are transferred into fallopian tube.

168. Answer (2)

Mifepristone is antagonistic to action of progesterone.

169. Answer (4)

HIV, AIDS and genital herpes are non-curable diseases in humans.

170. Answer (4)

Syphilis – *Treponema pallidum*

Genital warts – Human Papilloma Virus

AIDS – Human Immunodeficiency Virus

171. Answer (2)

GIFT – Gamete Intra Fallopian Transfer.

172. Answer (3)

Concentration of prolactin hormone is high during lactation which inhibits GnRH.

173. Answer (2)

Syphilis is curable in primary stage and its chancres are painless.

174. Answer (2)

Steroidal oral contraceptive pills are consumed for a period of 21 days starting preferably within the first five days of menstrual cycle but nonsteroidal oral contraceptive pills like Saheli is taken only once in a week.

175. Answer (4)

'X'-GIFT

'Y' - *in vivo*

176. Answer (3)

Saheli is a non-steroidal preparation.

177. Answer (4)

In-vitro fertilization is carried out in test tube baby programme.

178. Answer (1)

Barrier method includes condoms, diaphragms, vaults, cervical caps etc.

179. Answer (3)

Progestogens alone or in combination with estrogen can be used by females as injections or implants under the skin.

180. Answer (4)

The formation of sperm is not affected by vasectomy

181. Answer (2)

The incidence of STIs are reported to be very high among persons of age group 15-24 years.

182. Answer (3)

According to 2011 census report, the population growth rate in India was less than 2 per cent, i.e., 20/1000/year.

183. Answer (1)

IUD is one of the most widely accepted method of contraception in India

184. Answer (4)

Pills are very effective with lesser side effects and are well accepted by the females.

185. Answer (4)

Implants contains progestins as active ingredient. They inhibit ovulation and implantation as well as alter the quality of cervical mucus to prevent/retard the entry of sperms.

SECTION-B

186. Answer (2)

Family planning programmes in India were initiated in 1951

187. Answer (4)

For population growth, unprotected sexual co-habitation is not promoted.

188. Answer (3)

Natural methods of contraception work on the principle of avoiding chances of ovum and sperms meeting.

189. Answer (4)

Administration of progestogens or progestogen-estrogen combinations or IUDs within 72 hours of coitus have been found to effective as emergency contraceptives.

190. Answer (2)

Noreplant is an example of implant.

191. Answer (3)

Haemophilia, cholera and malaria are not sexually transmitted diseases.

192. Answer (4)

RCH – Reproductive and child healthcare.

193. Answer (2)

Condoms are not reusable. Condoms are made up of thin rubber/latex sheath that are used to cover the penis in the males and vagina in the females.

194. Answer (4)

The hormone releasing IUDs make the uterus unsuitable for implantation and the cervix hostile to the sperms.

195. Answer (4)

Government of India legalised MTP in 1971 with some strict conditions to avoid its misuse.

196. Answer (3)

Opinion of one registered medical practitioner is required for MTP, if the pregnancy has lasted less than 12 weeks.

197. Answer (1)

Saheli is a non-steroidal pill and it does not inhibit ovulation

198. Answer (2)

Day of ovulation = Number of menstrual days – 14

= 40 – 14

= 26

Range of fertile period

= 26 + 3 = 29

= 26 – 4 = 22

22nd to 29th days

199. Answer (2)

GIFT – Gametic intra fallopian transfer

AI – Artificial insemination

200. Answer (4)

Nirodh is a popular brand for male condom.

❑   ❑   ❑