GUJCET-PCE-2024

Test Booklet No. 1300618

Test Booklet Set No 13

This booklet contains 32 pages.

DO NOT open this Test Booklet until you are asked to do so.

Important Instructions :

1) The Physics and Chemistry test consists of 80 questions. Each question carries 1 mark. For each correct response, the candidate will get **1** mark. For each incorrect response ¼ mark will be deducted. The maximum marks are **80**.
2) This Test is of **2 hours** duration.
3) Use **Black Ball Point Pen only** for writing particulars on OMR Answer Sheet and marking answers by darkening the circle '●'.
4) Rough work is to be done on the space provided for this purpose in the Test Booklet only.
5) **On completion of the test, the candidate must handover the Answer Sheet to the Invigilator in the Room / Hall. The candidates are allowed to take away this Test Booklet with them.**
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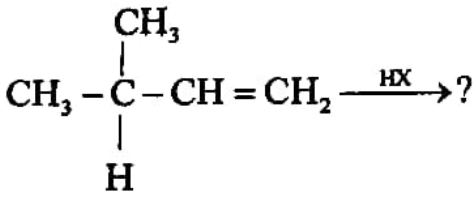
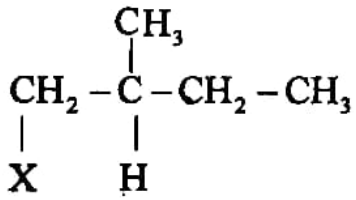
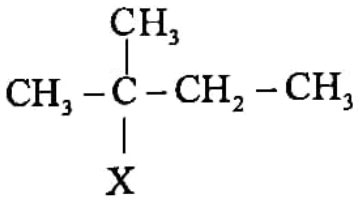
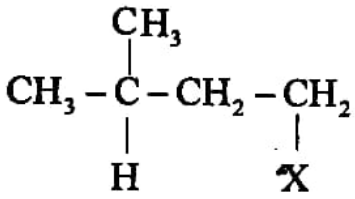
CHEMISTRY

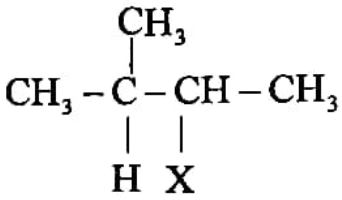
41) What is the major product in the following reaction?



(A) 

(B) 

(C) 

(D) 

42) Predict the order of reactivity of the following compounds in S_N1 reaction.

(i) $C_6H_5 \cdot CH_2Br$

(ii) $C_6H_5 \cdot CH \cdot (C_6H_5)Br$

(iii) $C_6H_5 \cdot CH(CH_3)Br$

(iv) $C_6H_5 \cdot C \cdot (CH_3)(C_6H_5)Br$

(A) (ii) > (iii) > (iv) > (i)

(B) (ii) > (iv) > (iii) > (i)

(C) (iv) > (iii) > (ii) > (i)

(D) (iv) > (ii) > (iii) > (i)

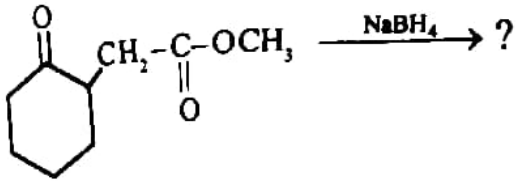
(Space for Rough Work)

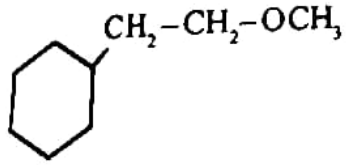
43) Match the reactions given in column - I with the names given in column - II.

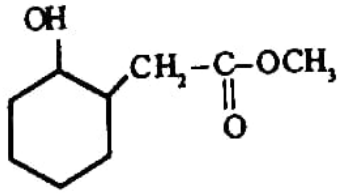
Column - I	Column - II
i) $R-Cl+NaI \xrightarrow[\text{acetone}]{\text{dry}} R-I+NaCl$	a) Swarts reaction
ii) $CH_3-Br+AgF \xrightarrow{\Delta} CH_3-F+AgBr$	b) Wurtz reaction
iii) $R-X+Mg \xrightarrow[\text{ether}]{\text{dry}} R-Mg-X \xrightarrow{H_2O} RH+Mg(OH)X$	c) Finkelstein reaction
	d) Grignard reaction

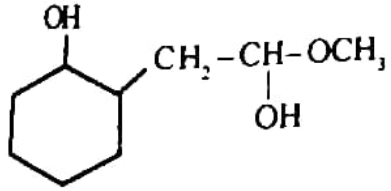
(A) (i) → (c); (ii) → (a); (iii) → (d)
(B) (i) → (d); (ii) → (c); (iii) → (b)
(C) (i) → (a); (ii) → (c); (iii) → (d)
(D) (i) → (b); (ii) → (a); (iii) → (d)

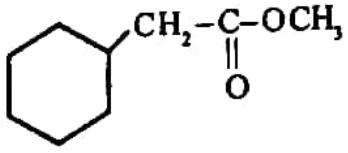
44) Which product will be obtained in the following reaction _____.



(A) 

(B) 

(C) 

(D) 

(Space for Rough Work)

45) Predict the major product of acid catalysed dehydration of butan–1–ol.

(A) $2CH_2 = CH_2$

(B) $CH_3 - \overset{\overset{CH_3}{|}}{C} = CH_2$

(C) $CH_3 - CH = CH - CH_3$

(D) $CH_3 - CH_2 - CH = CH_2$

46) Give the major product formed by heating

$$CH_3 - CH_2 - CH_2 - O - \overset{\overset{CH_3}{|}}{\underset{\underset{CH_3}{|}}{C}} - CH_2 - CH_3 \quad \text{With HI}$$

(A) $CH_3 - CH_2 - CH_2 - OH + CH_3 - CH_2 - \overset{\overset{CH_3}{|}}{\underset{\underset{CH_3}{|}}{C}} - I$

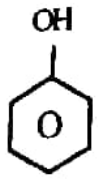
(B) $CH_3 - CH_2 - CH_2 - OI + CH_3 - CH_2 - \overset{\overset{CH_3}{|}}{\underset{\underset{CH_3}{|}}{CH}}$

(C) $CH_3 - CH_3 + I - CH_2 - O - \overset{\overset{CH_3}{|}}{\underset{\underset{CH_3}{|}}{C}} - CH_2 - CH_3$

(D) $CH_3CH_2CH_2I + CH_3 - CH_2 - \overset{\overset{CH_3}{|}}{\underset{\underset{CH_3}{|}}{C}} - OH$

(Space for Rough Work)

47) Arrange the following compounds in decreasing order of their acidic strength

i) 

ii) 

iii) 

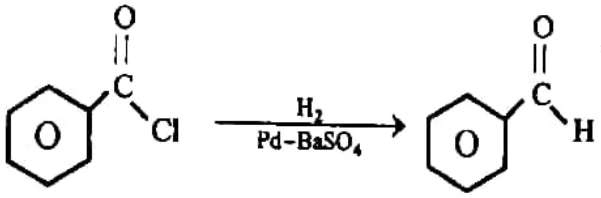
(A) (ii) > (iii) > (i)

(B) (iii) > (i) > (ii)

(C) (i) > (ii) > (iii)

(D) (ii) > (i) > (iii)

48) Name the following reaction.



(A) Clemmensen reduction

(B) Stephen reaction

(C) Etard reaction

(D) Rosenmund reduction

49) 'R' + $CH_3-CO-CH_3 \xrightarrow{H^+}$ Schiff's base what is 'R' in this reaction?

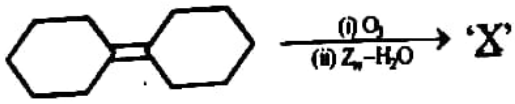
(A) C_6H_5–NH–NH_2

(B) NH_2–NH_2

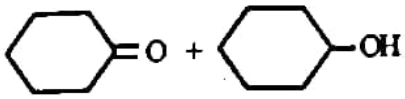
(C) CH_3–NH_2

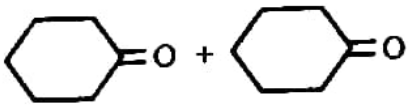
(D) NH_2OH

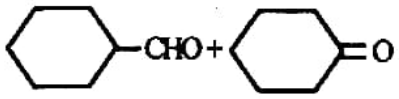
(Space for Rough Work)

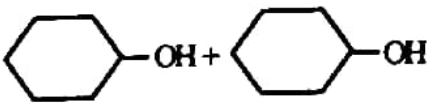
50)  'X'

What is X in this reaction?

(A) 

(B) 

(C) 

(D) 

51) Which of the following carboxylic acid has least pKa value among all?

(A) $NO_2 \cdot CH_2 \cdot COOH$

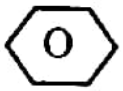
(B) $CH_3 \cdot COOH$

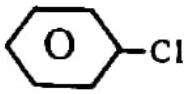
(C) $HCOOH$

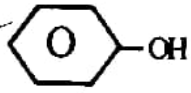
(D) $C_6H_5 \cdot COOH$

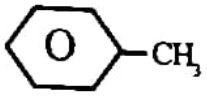
52) Identify 'C' in the following reaction.

$$C_6H_5NO_2 \xrightarrow{Fe/HCl} 'A' \xrightarrow[273K]{NaNO_2+HCl} B \xrightarrow[283K]{H_2O} 'C'$$

(A) 

(B) 

(C) 

(D) 

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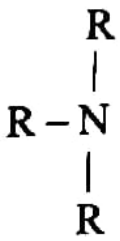
53) Which amine is prepared by Gabriel phthalimide synthesis?

(A) $Ar-NH_2$

(B) $R-NH-R$

(C) 

(D) $R-NH_2$

54) Which is the correct order of the basic strength of given amines?

(A) $(C_2H_5)_2NH > C_2H_5NH_2 > C_6H_5NH_2 > NH_3$

(B) $(C_2H_5)_2NH > C_2H_5NH_2 > NH_3 > C_6H_5NH_2$

(C) $NH_3 > C_6H_5NH_2 > (C_2H_5)_2NH > C_2H_5NH_2$

(D) $C_6H_5NH_2 > (C_2H_5)_2NH > C_2H_5NH_2 > NH_3$

55) Which diazonium salt is water insoluble and stable at room temperature?

(A) $C_6H_5 \cdot N_2^+BF_4^-$

(B) $C_6H_5N_2^+Br^-$

(C) $C_6H_5N_2^+HSO_4^-$

(D) $C_6H_5N_2^+Cl^-$

56) Lactose is composed of which units?

(A) α-D-Glucose and α-D-Glucose

(B) α-D-Glucose and β-D-Fructose

(C) β-D-Galactose and β-D-Glucose

(D) α-D-Glucose and β-D-Galactose

(Space for Rough Work)

57) Which of the following gives Zwitter ion in its aqueous solution?

(A) $COOH-CH_2-COOH$

(B) NH_2-CH_2-COOH

(C) $NH_2-CH_2-CH_2-NH_2$

(D) $CH_3CH_2\dot{N}H_2$

58) Deficiency of which vitamin is responsible for RBC deficient in haemoglobi

(A) Vitamin B_{12}

(B) Vitamin B_6

(C) Vitamin B_2

(D) Vitamin B_1

59) Which of the following statement is <u>incorrect</u> for the structure of Nucleic ac

(A) Nucleotides are joined together by phosphodiester linkage

(B) In DNA molecule, the sugar moiety is β-D-2-deoxyribose

(C) A unit formed by the attachment of a base 1' position of sugar is know nucleoside

(D) RNA contains four bases adenine, guanine, cytosine and thymine

(Space for Rough Work)

60) Calculate the mass of Glucose ($C_6H_{12}O_6$) required in making 2.5 kg of 0.25 molal aqueous solution.

[Atomic wt : H = 1, O = 16, C = 12 amu]

(A) 135.0 g
(B) 107.65 g
(C) 90.0 g
(D) 112.5 g

61) The vapour pressure of pure liquids 'P' and 'Q' are 450 and 750 mm of Hg respectively at 350 K. If total vapour pressure is 600 mm of Hg, the mole fractions of 'P' and 'Q' respectively will be _____ and _____.

(A) 0.7 and 0.3
(B) 0.4 and 0.6
(C) 0.6 and 0.4
(D) 0.5 and 0.5

62) The freezing point depression of 645 g of aqueous solution of ethylene glycol ($C_2H_6O_2$) is 2.25 K. Find weight of ethylene glycol in the solution.

[K_f = 1.86 K kg mol^{-1} ; H = 1, C = 12, O = 16 amu]

(A) 45.0 g
(B) 42.50 g
(C) 48.375 g
(D) 50 g

63) Van't Hoff factor (i) for dilute aqueous solution of $K_4[Fe(CN)_6]$, $Fe_4[Fe(CN)_6]_3$ and $[CoCl_2(en)_2]Cl_2$ are respectively ____,____,____.

(A) 2, 7, 5
(B) 2, 5, 7
(C) 5, 7, 2
(D) 7, 5, 2

64) Calculate the potential of hydrogen electrode in contact with a solution whose pH is 10.

(A) + 0.059 V
(B) – 0.059 V
(C) + 0.59 V
(D) – 0.59 V

(Space for Rough Work)

C6H12O6

= 12 + 12 + 96

180 × 0.

=

C2H6O2

12(2) + 6(1) + 16(2)

24 + 6 + 32

= 62

65) Which of the statements for solution of electrolyte is not correct?

(A) Conductivity of solution depends on the concentration of electrolyte

(B) Conductivity of solution depends on the nature of electrolyte

(C) Conductivity of solution does not depend upon temperature

(D) Conductivity of solution depends on the nature of solvent and its viscosity

66) During the electrolysis of higher concentration of H_2SO_4, the product obtained anode is _____.

(A) $O_{2(g)}$

(B) $S_2O_{8(aq)}^{2-}$

(C) $SO_{2(g)}$

(D) $SO_{3(aq)}^{2-}$

67) How much Faraday of electricity is required to reduce 1.5 mole $KMnO_4$ into Mn(in basic medium?

(A) 4.5 F

(B) 7.5 F

(C) 6.0 F

(D) 3.0 F

68) For any reaction the rate constant $K = 2.3 \times 10^{-5}\ mol^{-3/2}\ L^{3/2}S^{-1}$; then the order reaction will be _____.

(A) 0.0 (zero)

(B) 1.5

(C) 0.5

(D) 2.5

69) Which of the following statements is incorrect for a reaction carried out in presenc of catalyst?

(A) Potential energy of reactants and products change

(B) Equilibrium constant of the reaction does not change

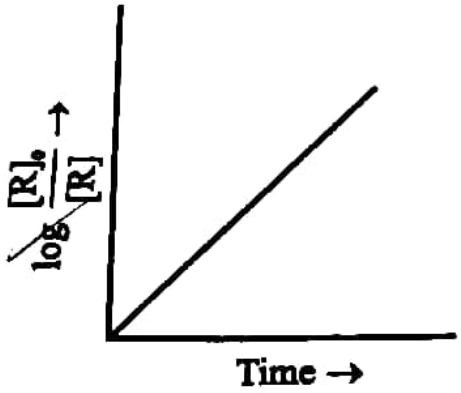
(C) There is no change in Gibbs energy of the reaction

(D) The activation energy of the reaction decreases

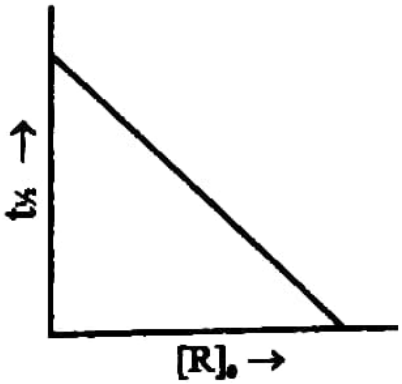
(Space for Rough Work)

70) Which of the following graphs is correct for a first order reaction R → P?

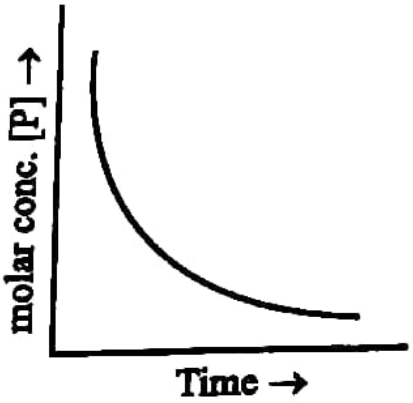
(A)



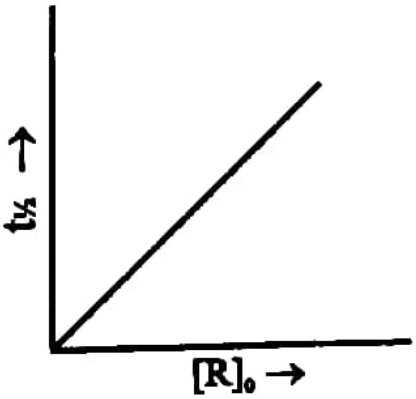
(B)



(C)



(D)



71) Reaction $2A \rightarrow B + 3C$ is zero order reaction. If $K = 3.5 \times 10^{-4}$ mol L^{-1} S^{-1}; What will be the rate of production of 'C'?

(A) 1.167×10^{-4} mol L^{-1} S^{-1}

(B) 10.5×10^{-4} mol L^{-1} S^{-1}

(C) 3.5×10^{-4} mol L^{-1} S^{-1}

(D) 7.0×10^{-4} mol L^{-1} S^{-1}

(Space for Rough Work)

72) $KMnO_4$ acts as on oxidising agent in acidic medium. The number of moles of $KMnO_4$ that will be needed to react with one mole of sulphide ion in acidic solution is _____.

(A) 1/5 (B) 3/5

(C) 4/5 (D) 2/5

73) Which one of the following is amphoteric oxide?

(A) V_2O_3 (B) CrO

(C) Cr_2O_3 (D) CrO_3

74) Which of the following ion show highest spin only magnetic moment value?

(A) Co^{2+} (B) Mn^{2+}

(C) Ti^{2+} (D) Fe^{2+}

75) Name the member of lanthanide series which is well known to exhibit + 4 oxidation state?

(A) Cerium (B) Thulium

(C) Gadolinium (D) Samarium

76) Which one is the correct formula for coordination compound

tris [ethane – 1, 2– diamine] cobalt (III) sulphate

(A) $[Co(en)_3]_3(SO_4)_2$ (B) $[Co(en)_3]_2(SO_4)_3$

(C) $[Co(en)_3](SO_4)_2$ (D) $[Co(en)_3]SO_4$

(Space for Rough Work)

77) Hybridizations in $[Ni(CO)_4]$ and $[Ni(CN)_4]^{-2}$ are respectively _____.

(A) sp^3 and dsp^2

(B) sp^3 and sp^3

(C) dsp^2 and sp^3

(D) dsp^2 and dsp^2

78) Identify the optically active compound from the following.

(A) $[Pt(NH_3)_2Cl_2]$

(B) $[Co(NH_3)_6]Cl_2$

(C) $[Co(en)_3]Cl_3$

(D) $[Co(NH_3)_5Cl]Cl$

79) In the complex $K[Cr(H_2O)_2(C_2O_4)_2].3H_2O$, oxidation state and co-ordination number of the central metal ion is _____ and _____.

(A) + 4, 4

(B) + 3, 4

(C) + 4, 6

(D) + 3, 6

80) Which reagent will be used for the following reaction?

$$CH_3CH_2CH_2CH_3 \xrightarrow{?} CH_3-CH_2-CH_2CH_2Cl + CH_3-CH_2-\underset{\displaystyle Cl}{\underset{|}{CH}}-CH_3$$

(A) Cl_2, air, Fe/dark

(B) $NaCl + H_2SO_4$

(C) Cl_2/UV light

(D) Cl_2, air/dark

(Space for Rough Work)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