GUJCET-PCE-2024

Test Booklet No. 1300618

Test Booklet Set No. 13

This booklet contains 32 pages.

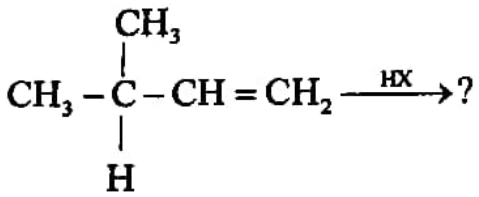
DO NOT open this Test Booklet until you are asked to do so.

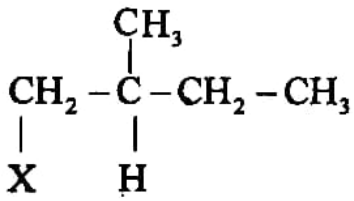
Important Instructions :

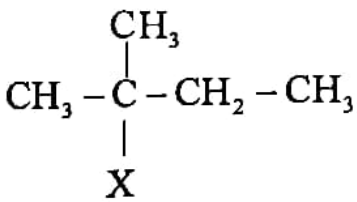
1) The Physics and Chemistry test consists of 80 questions. Each question carries 1 mark. For each correct response, the candidate will get **1** mark. For each incorrect response ¼ mark will be deducted. The maximum marks are **80**.
2) This Test is of **2 hours** duration.
3) Use **Black Ball Point 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.**
6) The Set No. for this Booklet is 13. Make sure that the Set No. printed on the Answer Sheet is the same as that on this booklet. In case of discrepancy, the candidate should immediately report the matter to the Invigilator for replacement of both the Test Booklet and the Answer Sheet.
7) The candidate should ensure that the Answer Sheet is not folded. Do not make any stray marks on the Answer Sheet.
8) Do not write your Seat No. anywhere else, except in the specified space in the Test Booklet / Answer Sheet.
9) Use of White fluid for correction is not permissible on the Answer Sheet.
10) Each candidate must show on demand his / her Admission Card to the Invigilator.
11) No candidate, without special permission of the Superintendent or Invigilator, should leave his / her seat.
12) Use of Simple (Manual) Calculator is permissible.
13) The candidate should not leave the Examination Hall without handing over their Answer Sheet to the Invigilator on duty and must sign the Attendance Sheet (Patrak - 01). Cases where a candidate has **not** signed the Attendance Sheet (Patrak - 01) will be deemed not to have handed over the Answer Sheet and will be dealt with as an unfair means case.
14) The candidates are governed by all Rules and Regulations of the Board with regard to their conduct in the Examination Hall. All cases of unfair means will be dealt with as per Rules and Regulations of the Board.
15) No part of the Test Booklet and Answer Sheet shall be detached under any circumstances.
16) The candidates will write the Correct Test Booklet Set No. as given in the Test Booklet / Answer Sheet in the Attendance Sheet. (Patrak - 01)

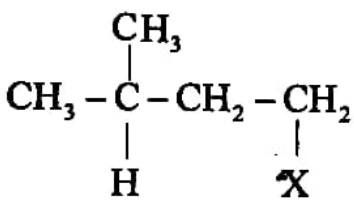
CHEMISTRY

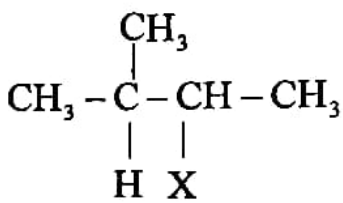
41) What is the major product in the following reaction?



(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)

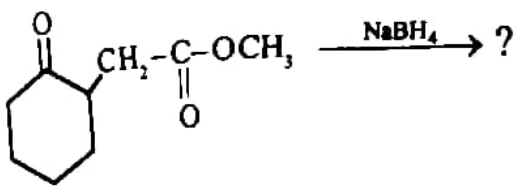
(Space for Rough Work)

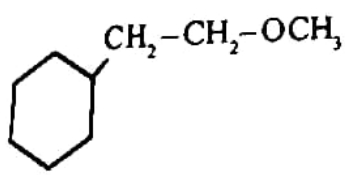
43) Match the reactions given in column - I with the names given in column - II.

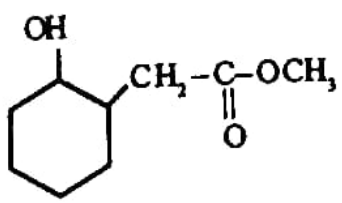
Column - I	Column - II
i) $R-Cl+NaI \xrightarrow[\text{acetone}]{\text{dry}} R-I+NaCl$	a) Swarts reaction
ii) $CH_3-Br+AgF \xrightarrow{\Delta} CH_3-F+AgBr$	b) Wurtz reaction
iii) $R-X+Mg \xrightarrow[\text{ether}]{\text{dry}} R-Mg-X \xrightarrow{\downarrow H_2O} RH+Mg(OH)X$	c) Finkelstein reaction
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

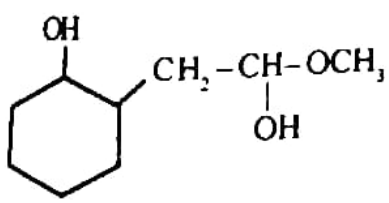
(A) (i) → (c); (ii) → (a); (iii) → (d)
(B) (i) → (d); (ii) → (c); (iii) → (b)
(C) (i) → (a); (ii) → (c); (iii) → (d)
(D) (i) → (b); (ii) → (a); (iii) → (d)

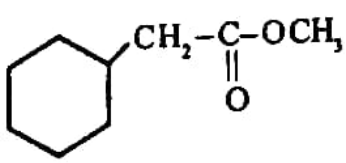
44) Which product will be obtained in the following reaction _____.



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

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

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

46) Give the major product formed by heating

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

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

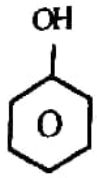
(B) $CH_3 - CH_2 - CH_2 - OI + CH_3 - CH_2 - \overset{CH_3}{\overset{|}{\underset{CH_3}{\underset{|}{CH}}}}$

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

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

(Space for Rough Work)

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

i) 

ii) 

iii) 

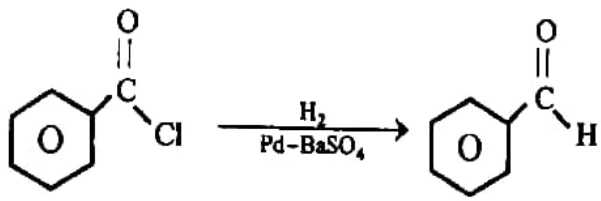
(A) (ii) > (iii) > (i)

(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) '<u>R</u>' + $CH_3 - CO - CH_3 \xrightarrow{H^+}$ Schiff's base what is 'R' in this reaction?

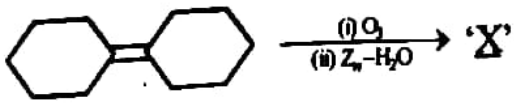
(A) C_6H_5–NH–NH_2

(B) NH_2–NH_2

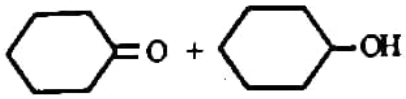
(C) CH_3–NH_2

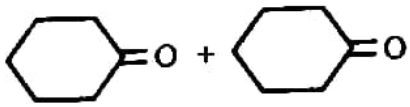
(D) NH_2OH

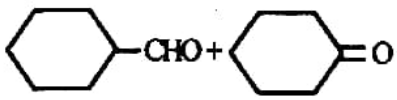
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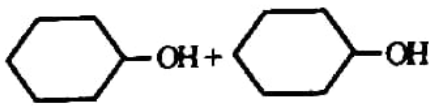
50)  'X'

What is X in this reaction?

(A) 

(B) 

(C) 

(D) 

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

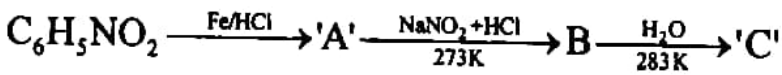
(A) $NO_2 \cdot CH_2 \cdot COOH$

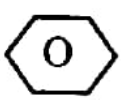
(B) $CH_3 \cdot COOH$

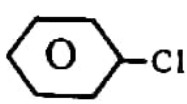
(C) HCOOH

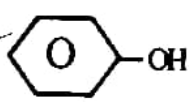
(D) $C_6H_5 \cdot COOH$

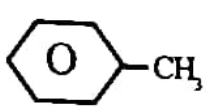
52) Identify 'C' in the following reaction.



(A) 

(B) 

(C) 

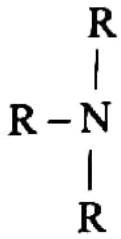
(D) 

(Space for Rough Work)

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 a

(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 kno 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

= 72 + 12 + 96

180 x 0.

=

C2H6O2

24 + 6 + 32

= 162

65) Which of the statements for solution of electrolyte is <u>not correct</u>?

(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 viscosit

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 <u>incorrect</u> for a reaction carried out in presen of catalyst?

(A) Potential energy of reactants and products change

(B) Equilibrium constant of the reaction does not change

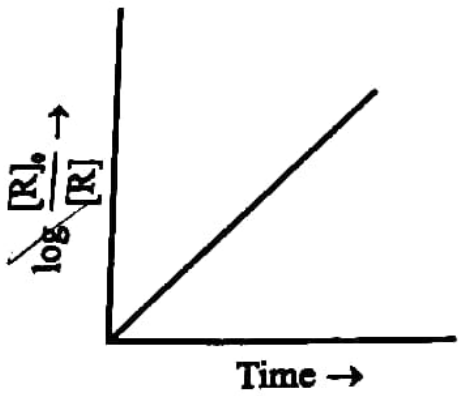
(C) There is no change in Gibbs energy of the reaction

(D) The activation energy of the reaction decreases

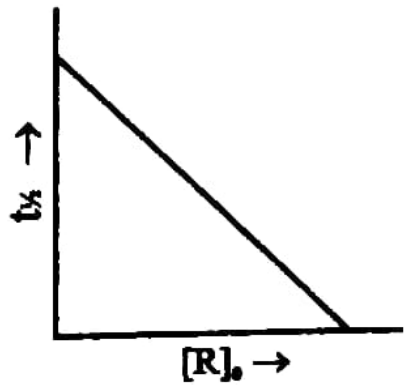
(Space for Rough Work)

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

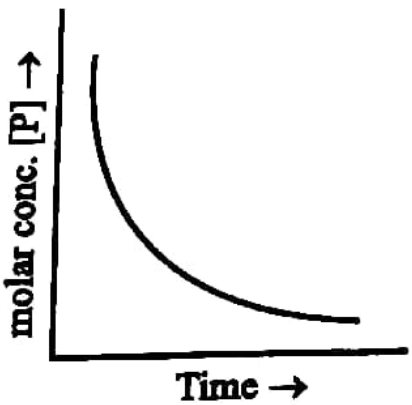
(A)



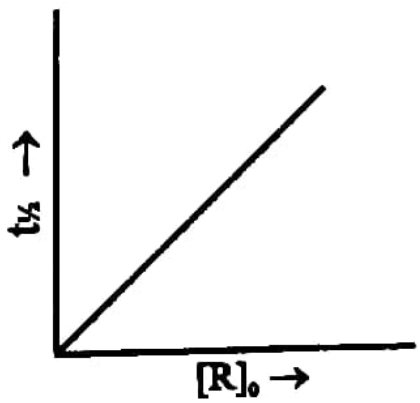
(B)



(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)