

2021

CHEMISTRY (General)

Paper Code : III (A) & IIIB.

[New Syllabus]

Paper Code : I-A

Full Marks : 30

Time : 30 minutes.

Choose the correct answer.

Each question carries 2 marks.

- 1) Which of the following compounds will not give Haloforem reaction
A) Ethanol B) Propopanol C) Benzophenone D) Acetophenone
- 2) A secondary amine is obtained by the reduction of
A) Nitroethane B) Methyl cyanide
C) Nidromethane D) Methyl isocyanide.
- (3) Which of the following compounds will easily take part in S_N^2 reaction
(A) $(CH_3)_3C-F$ (B) $(CH_3)_3C-Cl$ (C) $(CH_3)_3C-Bn$ (D) $(CH_3)_3C-I$
- (4) Which is S.I unit of entropy?
(A) $J\text{K}^{-1}\text{mol}^{-1}$ (B) $J\cdot\text{K mol}^{-1}$ (C) $J\cdot\text{K mol}$ (D) None of the above
- (5) Which isotope is used to treat cancers.
(A) e^{14} (B) U^{238} (C) Co^{60} (D) Pb^{206}
- (6) Which of the following species is not expected to be a ligand.
(A) NO (B) NH_4^+ (C) $NH_2-CH_2-CH_2-NH_2$ (D) CO
- (7) Which of the following compounds reacts fastest with Lucas reagent
(A) 1 Butanol (B) 2-Butanol (C) 2 methyl 2 propanol (D) 2 methyl 1 propanol

- 8) The weakest base among the following is
- NH_3
 - $\text{C}_6\text{H}_5\text{NH}_2$
 - $\text{C}_6\text{H}_5\text{CH}_2\text{NH}_2$
 - CH_3NH_2
- 9) Glucose is oxidised by nitric acid to yield
- Glucuronic Acid
 - Sorbitol
 - Glucuric Acid
 - Formic Acid
- 10) Gabriel phthalimide synthesis can be used to prepare
- Ethylamine
 - Benzylamine
 - p-toluidine
 - N-methylmethanamine.
- 11) Li can be isolated from the electrolysis of
- Li_2SO_4
 - Lepidolite
 - Spodumene
 - LiCl .
- 12) Which of the following is not an example of buffer solution?
- $\text{HNO}_2 + \text{KNO}_2$
 - $\text{HF} + \text{KF}$
 - $\text{PhNH}_2 + \text{PhNH}_3^+ + \text{Cl}^-$
 - $\text{NH}_3\text{Cl} + \text{HCl}$.
- 13) Which one is paramagnetic?
- $[\text{Ni}(\text{H}_2\text{O})_6]^{+2}$
 - $[\text{Ni}(\text{CO})_4]$
 - $[\text{Zn}(\text{NH}_3)_4]^{+2}$
 - $[\text{Co}(\text{NH}_3)_6]^{+3}$
- 14) $\text{CH}_3 - \overset{\text{C}}{\underset{\text{O}}{\text{||}}} - \text{CH}_2 \xrightarrow[\text{(li)}{\text{H}_3\text{O}^+}]{\text{(i)} \text{CH}_3\text{MgCl}} \text{P?}^+ \text{Mg}^{\text{OH}}\text{Cl}$
What is P?
- Isopropyl alcohol
 - Secondary butyl alcohol
 - Tert. butyl alcohol
 - Isobutyl alcohol.
- 15) Which of the following will not give aldol condensation?
- Phenyl Acetaldehyde
 - 2-Methyl pentanal
 - Benzaldehyde
 - 1 phenyl propanone

2021
 CHEMISTRY (General)
 Paper Code : III-B
 (New syllabus)

Full Marks : 60

Time: 2 hours 30 minutes

The figures in the margin indicates full marks.
 Answer total six questions taking two from each group.

Group - A
 [Organic chemistry]

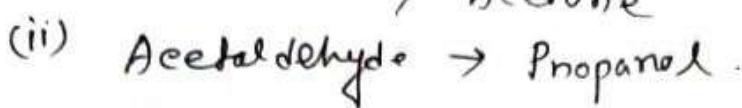
Answer any two questions.

$$10 \times 2 = 20$$

- ① a) What do you mean by 'Keto-Enol tautomerism'? ②
- b) Synthesise the following compounds starting from ethyl acetoacetate.
- (i) 2-pentanone
 - (ii) n-pentanoic acid $2+2=4$
- c) Write short notes on : i) Gabriel phthalimide Synthesis
 ii) Williamson Synthesis. $2+2=4$
- ② a) What is Mutarotation? ②
- b) What type of change in optical activity is observed when sucrose is hydrolysed by dilute acid. Explain. ②
- c) Transform. i) Fructose \rightarrow Fructosazone
- ii) Glucose \rightarrow Fructose. $2+2=4$
- d) Convert an aldopentose to an aldotetroses by using Kiliani-Fischer synthesis. ②

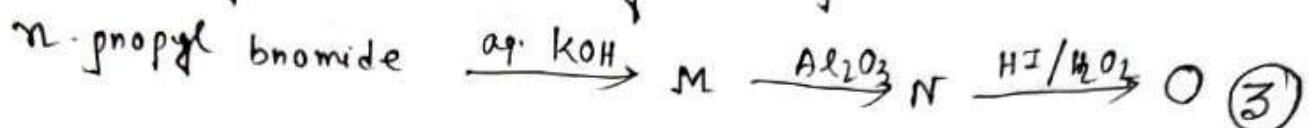
③ a) 2 butanol gives iodide test but not 1 propanol. Explain. (3)

b) Make the following conversion.



2+2 = (4)

c) Identify the following compounds. (M, N, O)

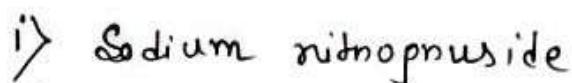


Group - B.

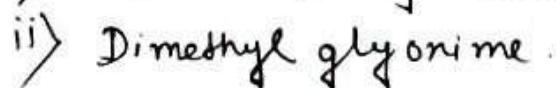
(Inorganic Chemistry)

④ Answer any two questions.

a) Write the preparation and uses of



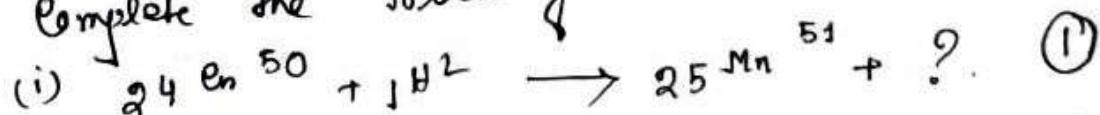
2+2 = (4)



b) Write the difference between nuclear fusion and fission reaction. (3)

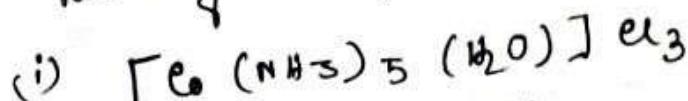
c) What is packing fraction? (2)

d) Complete the following reaction:

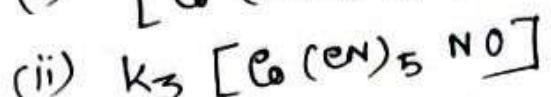


e) Give one example of tetradentate and hexadentate ligand. (2)

b) Write down the IUPAC nomenclature of the following complex salts.



(2)



- c) What is the unit of radioactivity? ①
- d) Discuss the geometrical isomerism of lowe co-ordinated complexes. Give example. ③
- e) What is chelating ligand. Give example. ②

- (6) a) Discuss briefly Werner's theory of co-ordination compound. Citing relevant example. ③
- b) Write the chemical formula of following complex salts.
- i) Potassium trionalennate ①
- ii) Sodium penta cyanidinetyl lennate ②
- c) AgCN easily dissolves in KCN solution though it expected to be less soluble in a solution having common ion explain. ③

- d) What is Lewis acid. ①
- e) Write the name and molecular formula of one ore of Au. ①

Group - e

[Physical chemistry]

Answer any two questions.

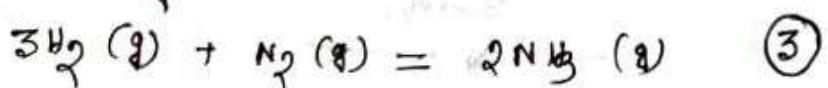
7) a) Write the difference between order and molecularity of a reaction. (2)

b) What is the unit of rate constant of a second order reaction? (1)

c) What do you mean by Pseudo unimolecular reaction? (2)

d) How the rate constant of reaction vary with temperature?

e) Write expression for k_p and K_c for the following reaction.



8) a) Write Kohlrausch's law. (2)

b) A 0.1 molar solution (1:1) type has specific conductance value 0.0092. Calculate the equivalent conductivity and degree of dissociation. ($\lambda^{\circ} = 108.9$) (2)

c) State La Chatelieris principle of chemical equilibrium. (2)

d) Distinguish between physical adsorption and chemical adsorption. (2)

e) Define standard emf (E°) of a cell. (2)

- Q) Write short notes on
i) Langmuir's adsorption isotherm.
ii) Clausius-Clapeyron equation.
iii) Common-ion effect.
iv) Ostwald dilution Law.
v) Solubility product.
- The End.