2021

CHEMISTRY (General)

Paper Code : III (A) & III B.

[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 Haloform reaction

A) Ethanol B) Isopropanol C) Benzophenone D) Acetophenone

2) A secondary amine is obtained by the reduction of

A) Nitroethane B) Methyl cyanide

C) Nitromethane D) Methyl isocyanide.

(3) Which of the following compounds will easily takes part in S_N1 reaction

(A) $(CH_3)_3C-F$ (B) $(CH_3)_3C-Cl$ (C) $(CH_3)_3C-Br$ (D) $(CH_3)_3C-I$

(4) Which is S.I unit of entropy?

(A) $J K^{-1} mol^{-1}$ (B) $J \cdot K mol^{-1}$ (C) $J \cdot K mol$ (D) None of the above.

(5) Which isotope is used to treat cancer.

(A) C^{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) $NH_2CH_2CH_2NH_2$ (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

(A) NH_3 (B) $C_6H_5NH_2$ (C) $C_6H_5CH_2NH_2$ (D) CH_3NH_2

(9) Glucose is oxidised by nitric acid to yield

(A) Gluconic Acid (B) Sorbitol (C) Glucarbic Acid (D) Formic Acid

(10) Gabriel phthalimide synthesis can be used to prepare

(A) Ethanamine (B) Benzanamine (C) p-toluidine

(D) N-methylmethanamine.

(11) Li can be isolated from the electrolysis of

(A) Li_2SO_4 (B) Lepidolide (C) Spodumene (D) LiCl.

(12) Which of the following is not an example of buffer solution?

(A) $HNO_2 + KNO_2$ (B) $HF + KF$

(C) $PhNH_2 + PhNH_3^+Cl^-$ (D) $NH_4Cl + HCl$.

(13) Which one is Paramagnetic?

(A) $[Ni(H_2O)_6]^{+2}$ (B) $[Ni(CO)_4]$

(C) $[Zn(NH_3)_4]^{+2}$ (D) $[Co(NH_3)_6]^{+3}$

(14) $CH_3-\underset{\underset{O}{\|}}{C}-CH_3 \xrightarrow[(ii)\ H_3O^+]{(i)\ CH_3MgCl} P$? + $Mg\begin{matrix}OH\\Cl\end{matrix}$

What is P?

(A) Isopropyl alcohol (B) Secondary butyl alcohol

(C) Tert. butyl alcohol (D) Isobutyl alcohol.

(15) Which of the following will not give aldol condensation?

(A) Phenyl Acetaldehyde (B) 2-Methyl pentanal

(C) Benzaldehyde (D) 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. 10×2=20

① a) What do you mean by 'Keto - Enol tautomerism'? (2)

b) Synthesis 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 hydrolised by dilute acid. Explain. (2)

c) Transform. i) Fructose → Fructosazone

ii) Glucose → Fructose. 2+2=(4)

d) Convert an aldopentose to an aldohexose by using "Kiliani - Fischer synthesis." (2)

(3) a) 2 butanol gives iodoform test but not 1 propanol. explain. (3)

b) Make the following conversion.

(i) Ethanol → Acetone

(ii) Acetaldehyde → Propanol. 2+2 = (4)

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

n-propyl bromide $\xrightarrow{aq.\ KOH}$ M $\xrightarrow{Al_2O_3}$ N $\xrightarrow{HI/H_2O_2}$ O (3)

Group - B.

(Inorganic Chemistry)

Answer any two questions.

(4) a) Write the preparation and uses of

i) Sodium nitroprusside 2+2 = (4)

ii) Dimethyl glyoxime.

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

c) What is packing fraction? (2)

d) Complete the following reaction:

(i) $_{24}Cr^{50} + {}_1H^2 \longrightarrow {}_{25}Mn^{51} + ?$ (1)

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

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

(i) $[Co(NH_3)_5(H_2O)]Cl_3$ (2)

(ii) $K_3[Co(CN)_5NO]$

c) What is the unit of radio activity ? (1)

d) Discuss the geometrical isomerism of four co-ordinated complexes. Give example. (3)

e) What is chelating ligand. Give example. (2)

(6) a) Discuss briefly Warner's theory of co-ordination compound. Citing relevant example. (3)

b) Write the chemical formula of following complex salts.

i) Potassium trioxalo ferrate (III).

ii) Sodium pentacyanonitrosyl ferrate II. (2)

c) AgCN easily dissolves in KCN solution through 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 - C

[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. (2)

$$3H_2(g) + N_2(g) = 2NH_3(g)$$ (3)

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 Chatelier's principle of chemical equilibrium. (2)

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

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

9) Write short notes on 5×2.

i) Langmuir's adsorption isotherm.

ii) Clausius - Clapeyron equation.

iii) Common - Ion effect.

iv) Ostwald dilution Law.

v) Solubility product.

The End.