



Progressive Education Society's
Modern College of Arts, Science & Commerce Ganeshkhind, Pune – 16
End Semester Examination: April 2024
Faculty: Science and Technology
Semester: IV

SET: B

Program: B.Sc.

Program (Specific): B.Sc. General

Class: S.Y.B. Sc.

Name of the Course: Organic and Inorganic Chemistry

Course Code: 23-CH-402

Paper: II

Course Type: Core

Max. Marks : 35

Time: 2Hrs.

Instructions to the candidate:

- 1) *There are 4 sections in the question paper. Write each section on separate page.*
- 2) *All Sections are compulsory.*
- 3) *Figures to the right indicate full marks.*
- 4) *Draw a well labelled diagram wherever necessary.*
- 5) *Atomic number of Fe = 26, Co = 27*

SECTION: A

Q1) Answer the following:

5 x 1 Mark = 5 Marks

- a) Give the electronic configuration of Co.
- b) Explain: ZnSO_4 is a colourless compound.
- c) Write the formula of tetrahydroxoplumbate(II) ion.
- d) Define a ligand.
- e) Define Isomerism.

Q2) Answer any four of the following:

4 x 1 Mark = 4 Marks

- a) Write the structures of 3-hexanone and 2,4-dihydroxybenzaldehyde.
- b) Draw the conformations of methylcyclohexane.
- c) Which of the following aldehydes undergo Cannizzaro's reaction? Justify.
benzaldehyde, ethanal, propionaldehyde and formaldehyde.
- d) Give any one method of synthesis of carboxylic acids RCOOH .
- e) What is Bayer's strain theory?
- f) How can acetyl chloride be synthesized from acetic acid?

SECTION: B

Q3) Answer any four of the following:

4 x 2 Marks = 8 Marks

- i) Write any two characteristics of secondary valency.
- ii) Define a chelate and give an example.
- iii) Explain: d block compounds are mostly paramagnetic. Give an example.
- iv) State whether EAN rule is obeyed by $K_4[Fe(CN)_6]$ complex.
- v) Draw the Werner complex of $CoCl_3 \cdot 5NH_3$. Mention primary and secondary valency.
- vi) Give an example of Coordination isomerism and Hydrate isomerism.

SECTION: C

Q4) Answer any four of the following:

4 x 2 Marks = 8 Marks

- i) Explain Crossed Aldol Condensation with a suitable example.
- ii) Write a note on diazotization of aniline.
- iii) Give an account of ester hydrolysis in acidic and basic medium.
- iv) What is Iodoform Test? Name two ketones which show the test positive.
- v) Write the reaction of conversion of phenyl methyl ketone to ethyl benzene by Wolff Kishner reduction.
- vi) Draw chair conformation of cyclohexane showing axial and equatorial H atoms.

SECTION: D

Q5) Answer any two of the following:

2 x 5 Marks = 10 Marks

- a) Predict the products in the following reactions.
 - i) Reaction of CH_3COCH_3 with ethylene glycol ($HOCH_2CH_2OH$)
 - ii) Reaction of $PhCHO$ with H_2NNH_2
- b) Draw conformations of 1,1-dimethylcyclohexane and comment on the stability.
- c) State five differences between Double salt and Complex compound.
- d) Draw geometrical and optical isomers of $[MA_4B_2]$ complex with an example.