No. of Printed Pages : 3

Sem-V-Chem-CC-11
(Reg&Back)

2020-21

Time - 3 hours

Full Marks - 60

*Answer **both groups** as per instructions.*
Figures in the right hand margin indicate marks.
Candidates are required to answer
in their own words as far as practicable.

GROUP - A

1. Answer any five questions. [2 × 5

(a) Discuss the Zwitter ion structure of α-amino acid.

(b) What is dipeptide ? Give an example.

(c) Write two important differences between soap and detergent.

(d) What is Fries reaction ?

(e) Find the number of stereoisomers for aldohexose ($C_6H_{12}O_6$).

(f) Convert glucose to mannose.

(g) What are vat dyes ?

(h) Discuss the colour change of methyl orange in acidic and basic medium.

P.T.O.

GROUP - B

*Answer **ALL** questions.*

2. (a) How is α-amino acid prepared by Strecker, Gabriel phthalide and azlactone method ? [6

(b) Write notes on : [2 × 2

(i) Isoelectric point

(ii) Acid-base behaviour of amino acid

OR

(a) Discuss the peptide structure determination by end group analysis. [5

(b) Write a note on solid phase peptide synthesis. [5

3. Discuss the mechanism and applications of

(a) Demzanov rearrangement [5

(b) Benzillic acid rearrangement [5

OR

Write mechanism and applications of

(a) Reformatsky reaction [5

(b) Mannich reaction [5

4. (a) Discuss about the iodic value and acid value of fats and oils. [6

(b) Write notes on : [2 × 2

(i) Soaps and detergents

(ii) Saponification of oil and fat

OR

Write notes on : [6 + 4

(a) Micelle formation and CMC

(b) Hydrogenation of oils

5. (a) Briefly discuss about the cyclic structure of D(+)-glucose. [6

(b) Write down the mechanism of mutarotation. [4

OR

(a) Discuss the mechanism of osazone formation. [5

(b) Explain the formation of ethers and esters. [5

6. (a) Discuss about the chemistry of dyeing. [5

(b) Write synthesis and applications of Triphenyl methane dye. [5

OR

Write notes on : [5 × 2

(a) Colour and constitution

(b) Azo dyes

No. of Printed Pages : 3

Sem-V-Chem-CC-12
(Reg&Back)

2020-21

Time - 3 hours

Full Marks - 60

*Answer **both groups** as per instructions.*
Figures in the right hand margin indicate marks.
Candidates are required to answer
in their own words as far as practicable.

GROUP - A

1. Answer any five questions. [2 × 5

(a) Give two limitations of Valence Bond theory.

(b) Find magnetic moment of $[CoF_6]^{3-}$ complex.

(c) Explain the colour of $K_2Cr_2O_7$ although chromium has d^0 configuration.

(d) State and explain effective atomic number rule.

(e) Explain the structure of $Mn_2(CO)_{10}$.

(f) Give two nuclear reactions induced by $_0n^1$.

(g) What is carbon dating ?

P.T.O.

GROUP - B

*Answer **ALL** questions.*

2. (a) Discuss the crystal field splitting of 'd' orbitals in tetrahedral field. [8

(b) Explain $\Delta_0 > \Delta_t$. [2

OR

(a) Discuss the factors affecting the crystal field splitting of d-orbitals in complex. [6

(b) Calculate CFSE of Fe^{3+} ion complex in both strong and weak octahedral field. [4

3. Write notes on :

(a) Selection rules for d-d transition [5

(b) Discuss about L-S coupling. [5

OR

(a) Discuss about different types of electronic transitions. [6

(b) Explain colour and magnetic character of $[Ti(H_2O)_6]^{3+}$ complex. [4

4. (a) Discuss about thermodynamic and kinetic stability of complexes. [6

(b) What is Ligand field effect ? [4

OR

Write notes on : [5 + 5

(a) Trans effect

(b) Mechanism of substitution in octahedral complexes

5. Discuss the preparation and bondings of $Fe(CO)_5$ and $Fe_2(CO)_9$ complexes. [10

OR

Discuss baout the preparation and bondings of alkyl and aryl Lithium. Write two applications of Lithium complex. [8 + 2

6. Write notes on : [5 + 5

(a) Natural and artificial radioactivity

(b) Hydrogen bond

OR

Write notes on : [5 + 5

(a) Nuclear fusion

(b) Liquid drop model

No. of Printed Pages : 3

Sem-V-Chem-DSE-1
(Reg&Back)

2020-21

Time - 3 hours

Full Marks - 60

*Answer **both groups** as per instructions.*
Figures in the right hand margin indicate marks.
Candidates are required to answer
in their own words as far as practicable.

GROUP - A

1. Answer any five questions. [2 × 5

(a) What are natural and synthetic polymers ?

(b) What is the difference between a macro molecule and a polymer ?

(c) Name the catalysts used for cationic polymerisation.

(d) What do you understand by number average molecular weight of polymers ?

(e) What is a co-polymer and give examples of it.

(f) Write the uses of PVC.

(g) How is Nylon-6 prepared ?

(h) What is tenacity ?

P.T.O.

(i) Differentiate between thermosetting and thermoplastic polymers.

(j) What do you mean by degree of polymerisation ?

GROUP - B

*Answer **ALL** questions.*

2. How polymers are classified on the basis of their source, composition, mechanism and process of polymerisation ? [10

OR

Write notes on : [5 × 2

(a) Distinction between addition and condensation polymerisation

(b) Importance of polymers

3. Write the mechanism and kinetics of condensation polymerisation. [10

OR

Write the kinetics of cationic and anionic polymerisation. [10

4. What are end-groups ? Molecular weight of which polymers can be determined by end-group analysis ? Discuss with examples. [10

OR

Write notes on : [5 × 2

(a) Number-average and Weight-average molecular weight

(b) Viscometry method to determine molecular weight

5. Discuss the management of plastics in the environment by recycling method. [10

OR

Write notes on : [5 × 2

(a) Thermal degradation of plastics

(b) Oxidative stability of plastics

6. Write notes on : [5 × 2

(a) Silicone polymers

(b) PVC

OR

Write the synthesis and uses of : [5 × 2

(a) Phenol-formaldehyde resin

(b) Poly styrene

No. of Printed Pages : 3

Sem-V-Chem-DSE-2
(Reg&Back)

2020-21

Time - 3 hours

Full Marks - 60

*Answer **both groups** as per instructions.*
Figures in the right hand margin indicate marks.
Candidates are required to answer
in their own words as far as practicable.

GROUP - A

1. Answer any five questions. [2 × 5

(a) What is photosensitive glass ?

(b) What are fertilizers ? Give examples.

(c) Write the composition of glass.

(d) What is RM value ?

(e) What are the ingedients of transparent soap ?

(f) Define octane number.

(g) What do you mean by flash point ?

(h) What is aniline temperature ?

P.T.O.

GROUP - B

*Answer **ALL** questions.*

2. How glass is manufactured and processed ? Write the composition of coloured glass. [4 + 4 + 2

OR

What are silicate and non-silicate glasses ? Give examples of it and write the properties of sodalime glass. [4 + 2 + 4

3. What are different types of fertilizers ? Give examples of each. Describe a method for the manufacture of urea. [2 + 3 + 5

OR

How cement is classified ? Describe a process for the manufacture of cement. What are quick-setting cements ? [3 + 5 + 2

4. How vegetable oil is manufactured by solvent extraction method ? Write the distinction between oil and fat. What is the chemical nature of wax ? [4 + 4 + 2

OR

What is transparent soap ? Write the ingredients and process of manufacture of this soap. [2 + 3 + 5

5. Discuss the process for the manufacture of paper and describe clean technologies involved in agro-based industries. [5 + 5

OR

Discuss the process of manufacture of sulphate pulp and the chemical processes involved in it. [10

6. Write the composition of petroleum. How flash point of petroleum is determined ? Give the process of upgradation by polymerisation. [3 + 4 + 3

OR

Write notes on : [5 × 2

(a) Knocking and anti-knocking agents

(b) Rocket fuels