BFMS–427

M.Sc. (Final) Examination, 2023

CHEMISTRY

Paper – VII (B)

(Group–A) (CH–504)

(Metal Complexes, Polymers and Ceramics)

Time : 3 Hours]   [*Maximum Marks : 75*

Section–A   **(Marks : 2 × 10 = 20)**

Note :–   Answer all *ten* questions (Answer limit **50** words). Each question carries **2** marks.

Section–B   **(Marks : 5 × 5 = 25)**

Note :–   Answer all *five* questions. Each question has internal choice (Answer limit **200** words). Each question carries **5** marks.

Section–C   **(Marks : 10 × 3 = 30)**

Note :–   Answer any *three* questions out of five (Answer limit **500** words). Each question carries **10** marks.

Section–A

1.   (i)   What is Lambert-Beer's Law ?

     (ii)   What is triplet state ?

     (iii)   What do you mean by metal complex sensitizer ?

     (iv)   What are charge-transfer spectra ?

(v) Write composition of Glass.

(vi) What are Titania ?

(vii) Write composition of cement.

(viii) Explain degree of polymerisation.

(ix) What is glass transition temperature and crystalline melting point ?

(x) What are epoxy resins ?

Section–B

2. What is Flash Photolysis ?

Or

Explain structural properties of excited states.

3. Write *two* applications of redox processes of electronically excited states of metal complexes.

Or

What are metal complex electron relay ?

4. Explain raw materials used in refractories.

Or

What is liquid chromatography ?

5. Explain the following :
   (i) Addition Polymerisation
   (ii) Homogeneous Polymerisation

Or

Explain plastic elastomers and fibres.

6. Write short notes on the following :
   (i) Polyesters
   (ii) Polyvinylchloride

Or

Explain materials used for artificial heart.

Section–C

7. Write short notes on the following :

   (i) Franck-Condon principle

   (ii) Stopped flow technique

   (iii) Bimolecular deactivation

8. What are electron transfer reactions ? Explain the reducing and oxidizing character of Ruthenium (2, 2' –bipyridal) complexes.

9. Write short notes on methods for molecular weight determinations :

   (i) Viscosity measurements

   (ii) Osmotic measurements

   (iii) Ultracentrifugation method.

10. Expalin differential Thermal Analysis (DTA) and Thermo Gravimetric Analysis (TGA) with suitable examples.

11. Explain the following :

    (i) Functional Polymers

    (ii) Dental Polymers