Reg. No. | | | | | | | | | |

CAS 505

Third Semester M.Sc. Degree Examination, December 2018
ANALYTICAL CHEMISTRY
(CBCS : 2016-17 Syllabus)
Analytical Chemistry of Polymers

Time : 3 Hours Max. Marks : 70

***Note** : 1) Answer Part – **A** and **any four** questions from Part – **B**.*
*2) Figures to the **right** indicate **marks**.*

PART – A

1. Answer **all** the following sub-divisions. **(9×2=18)**
   a) Define degree of polymerization and its significance.
   b) State differences between thermoplastic and thermoset polymers with suitable examples.
   c) Define the term Tc and its importance.
   d) What are elastomers and fiberes ?
   e) Name any four plasticizers.
   f) Differentiate between LDPE and HDPE.
   g) What are the units of flexural, impact and tear resistance in SI units ?
   h) Why Al_2O_3 is used as reference material in DSC ?
   i) Define flame retardant polymers and mention their two uses.

PART – B

Answer **any four full** questions. **(4×13=52)**

2. a) Explain the concept and significance of polydispersitivity and molecular weight distribution with regard to polymers.
   b) What will be the molecular weight of PVC with degree of polymerization of 1000 ? Compare this with any polyamide polymer of same degree of polymerization ?
   c) State the Mark Houwink equation. Discuss the significance of different parameters of this equation in determining the molecular weight of the polymer by viscosity method. **(5+3+5)**

P.T.O.

3. a) Discuss various factors which affect the glass transition temperature of polymers. Describe any one method to experimentally determine T_g of a polymer.
   b) Give an account on the effect of polymer structure on T_g and T_m temperature of polymers.
   c) Derive the equation for number average molecular weight of polymers. **(5+5+3)**

4. a) Explain the properties of polymer blends and their applications.
   b) Discuss the polymer processing by calendering technique.
   c) Write a note on the applications of Teflon. **(5+5+3)**

5. a) With the help of a neat diagram, explain the melt spinning technique and its applications.
   b) Discuss the advantages and applications of composites.
   c) Account on the preparation and properties of silicone polymers. **(5+5+3)**

6. a) Give an account of measurement of molecular weight by light scattering method.
   b) Explain the effect of shape and structure of polymeric molecules on the mechanical properties such as tensile strength and impact strength.
   c) Describe the importance of conducting polymers. **(5+5+3)**

7. a) Explain the measurement of thermal conductivity of polymers and its importance.
   b) Give an account of Biomedical polymers and its applications.
   c) Write the structure and properties of phthalocyanine polymers. **(5+5+3)**
