This question paper contains **4** printed pages]

BR—373—2016

FACULTY OF SCIENCE

M.Sc. (Second Year) (Third Semester) EXAMINATION

OCTOBER/NOVEMBER, 2016

(Revised Course)

ORGANIC CHEMISTRY

Paper XVI (CH-534/2B)

(Polymer Chemistry–I)

(Wednesday, 23-11-2016) **Time : 2.00 p.m. to 5.00 p.m.**

Time—Three Hours *Maximum Marks*—50

N.B. :— (*i*) Attempt *All* questions.

(*ii*) Figures to the right indicate full marks.

1. Attempt any *five* of the following : 10

(*a*) Explain the method of bulk polymerisation.

(*b*) Explain the hydrogenation reaction of polyisoprene and styrene butadiene rubber.

(*c*) Describe spray-up technique for producing reinforced plastic articles.

(*d*) Describe the process of foaming for producing spongy materials.

(*e*) Explain why nylon-6 is soluble in some solvents at room temperature whereas linear polyethylene is not ?

(*f*) What is glass transition temperature ?

P.T.O.

(*g*) What is the practical use of knowledge of molecular weight of polymer ?

(*h*) How may X-ray diffraction data be used to estimate the size of polymer crystallinity ?

2. Answer any *four* of the following : 10

(*a*) Write merits of suspension polymerisation.

(*b*) Describe the types of polymers giving examples.

(*c*) Describe the process of determination of molecular weight of polymer by sedimentation method.

(*d*) What is strain induced morphology of polymer ?

(*e*) Discuss in detail polymer tacticity of polymers..

(*f*) Comment in detail on die casting.

3. Answer any *two* of the following : 10

(*a*) Describe the method of emulsion polymerisation.

(*b*) Comment on extrusion moulding process in detail.

(*c*) Show how NMR can be used to distinguish a random copolymer.

4. Answer any *two* of the following : 10

(*a*) Describe the process of determination of molecular weight of polymer by light scattering method.

(*b*) Comment on calendering process in the formation of film.

(*c*) Explain the morphology of polymers and give the properties required for better crystal structure of polymers.

5. (A) Choose the *correct* answer from the given multiple choice : 5

(*i*) Vinyl monomers with electron withdrawing groups are polymerised by ..... .

(*a*) Anionic (*b*) Cationic

(*c*) Free radicals (*d*) None of these

(*ii*) Limiting viscosity is the ..... viscosity.

(*a*) Relative (*b*) Specific

(*c*) Inherent (*d*) Intrinsic

(*iii*) In DSC thermogram ..... is measured against temperature.

(*a*) Mass (*b*) Heat flow

(*c*) Elongation (*d*) Name of these

(*iv*) The poly (tetrafluoroethylene) (T_m = 327°C) melts much higher than polythylene because of its ..... .

(*a*) High enthalpy of fusion

(*b*) Low enthalpy of fusion

(*c*) Low entropy of fusion

(*d*) High entropy of fusion

P.T.O.

(*v*) ..... are used for making garments and undergarments.

(*a*) Comfort fibres (*b*) Safety fibres

(*c*) Industrial fibres (*d*) None of these

(B) Write short notes on any *two* : 5

(*a*) Crystalline melting point

(*b*) Plastics

(*c*) Chemical analysis of polymers.