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AI—241—2017

FACULTY OF SCIENCE

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

NOVEMBER/DECEMBER, 2017

(CBCS Pattern)

ORGANIC CHEMISTRY

Paper XVIII (CH-534/2B)

(Polymer Chemistry—I)

(Friday, 17-11-2017) **Time : 2.00 p.m. to 5.00 p.m.**

Time—Three *Hours* *Maximum Marks*—75

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

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

1. Solve any *three* of the following : 15

(*a*) Explain the process of bulk polymerisation in the formation of polymer.

(*b*) Explain acidolysis and aminolysis reactions of polymer.

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

(*d*) What is crystalline melting point (T_m) ? How is it determined ?

(*e*) Describe the process of thermoforming for fabricating articles.

2. Attempt any *three* of the following : 15

(*a*) What are polymers ? How are they made ?

(*b*) Explain light scattering method for the determination of molecular weight of polymer.

(*c*) Describe calendering process in the production of films.

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

(*e*) Why does polypropylene undergo a greater change in physical properties near T_g then does linear polyethylene ?

P.T.O.

3. (*a*) Explain the method of emulsion polymerisation in the formation of polymer. 8

Or

Explain the effect of the molecular weight on the specific gravity of polytetrafluoroethylene.

(*b*) State the different methods of spinning of a polymer and explain in detail "dry spinning" process. 7

Or

Explain how infrared spectroscopy can be used to determine the copolymer reactivity ratio.

4. (*a*) Explain the process of determination of molecular weight of polymer by viscosity measurement method. 8

Or

Mention different types of moulding processes and comment in detail on "Injection Moulding".

(*b*) What is condensation polymerisation ? Explain the mechanism of condensation polymerisation. 7

Or

Explain sedimentation method for determination of molecular weight of polymer.

5. (A) Select the correct alternative from the following : 5

(*i*) The unsaturated polymers containing double bonds are easily attacked by ..... .

(*a*) Hydrogen (*b*) Oxygen

(*c*) Nitrogen (*d*) Phosphorous

(*ii*) Tear strength is closely related to ..... .

(*a*) Tensile strength (*b*) Impact strength

(*c*) Hardness (*d*) Softness

(*iii*) Crystallinity of polymer is determined by ..... .

(*a*) X-ray diffraction (*b*) Light scattering method

(*c*) ESCA (*d*) Viscosity measurement

(*iv*) Viscosity average molecular weight is represented by ..... .

(*a*) $\overline{M_n}$ (*b*) $\overline{M_w}$

(*c*) $\overline{M_v}$ (*d*) $\overline{M_z}$

(*v*) Balls and dolls are produced by a process called ..... .

(*a*) Die Casting (*b*) Rotational Casting

(*c*) Film Casting (*d*) Compression moulding

(B) Write short notes on any *two* : 10

(*i*) Thermal analysis

(*ii*) Strain induced morphology

(*iii*) Compounding.