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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 calendaring 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 than 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.