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AG—241—2018

FACULTY OF SCIENCE

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

NOVEMBER/DECEMBER, 2018

(CBCS Pattern)

ORGANIC CHEMISTRY

Paper-XVIII (CH-534/2-B)

(Polymer Chemistry-I)

(Monday, 3-12-2018) **Time : 2.00 p.m. to 5.00 p.m.**

Time—3 *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 cationic polymerisation with example.

(*b*) Describe hand lay-up process for producing reinforced plastic articles.

(*c*) Explain factors influencing the glass transition temperature.

(*d*) Sketch typical stress-strain curves for silk-like and wool-like fibres.

(*e*) Explain the calendering process to produce films and sheets.

2. Answer the following questions (any *three*) : 15

(*a*) Compare addition and condensation polymerisation.

(*b*) What is turbidity ? Give relation between turbidity and concentration of polymer solution.

P.T.O.

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

(*d*) Why does polypropylene undergo a greater change in physical property near Tg than does linear polyethylene.

(*e*) What is strain induced morphology of polymers ? Explain.

3. (*a*) Explain the bulk polymerisation with merits and demerits of bulk polymerisation. 8

Or

What are the effects of plasticizers, molecular weight branching, cross linking and tacticity on the Tg of the polymer ?

(*b*) What are types of spinning ? Explain wet spinning process of a polymer. 7

Or

Describe the sedimentation method for determination of molecular weight of polymer.

4. (*a*) Describe the process by determination of molecular weight of polymer by light scattering method. 8

Or

Mention different types of moulding processes and explain injection moulding in detail.

(*b*) Explain how chromatography technique useful for determining polymer. 7

Or

Describe the solution polymerisation of polymer. Give its merits.

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

(1) Whether the polymer is crystalline or amorphous is characterised by .....

(*a*) X-ray diffraction

(*b*) Thermogravimetric analysis

(*c*) Mass spectroscopy

(*d*) Thermogravimetric analysis

(2) The *z*-average molecular weight is represented by .....

(*a*) $\bar{M}_v$

(*b*) $\bar{M}_n$

(*c*) $\bar{M}_w$

(*d*) $\bar{M}_z$

(3) Vinyl monomers with electron donor groups are polymerised by ..... mechanism.

(*a*) Anionic

(*b*) Cationic

(*c*) Co-ordination

(*d*) Free radicals

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

(*a*) Die-casting

(*b*) Film casting

(*c*) Rotational casting

(*d*) None of the above

P.T.O.

(5) ..... of chain molecules aries from rotation around saturated chain bands.

(*a*) Solubility

(*b*) Fusibility

(*c*) Flexibilty

(*d*) Diffusibility

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

(*a*) Glass transition temperature (T_g)

(*b*) Average molecular weight concept

(*c*) Elastomers.