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SEAT No. _____

Sardar Patel University

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Sc

B.Sc. (Sixth Semester) Examination

31st March 2018, Saturday

Subject Code: US06CICV03 (Polymer Science)

Industrial Chemistry (Vocational)

Time: 10:00 am to 01:00 pm

Total Marks: 70

Choose the correct answer from the following

- Q.1. 1 A _____ arrangement of the unsymmetrical groups or atoms along the backbone planes are known as Atactic polymer (1)
(a) One side (b) Alternate (c) Random (d) None of these
- Q.1. 2 Starch is example of _____ polymer. (1)
(a) Synthetic (b) Semi-Synthetic (c) Natural (d) None of these
- Q.1. 3 Usually bivalent molecules give _____ polymer. (1)
(a) Alternate (b) Random (c) Branched (d) Linear
- Q.1. 4 All Synthetic polymers are polydisperse and their M_w/M_n value is _____. (1)
(a) ≥ 1 (b) ≤ 1 (c) 0 (d) $\neq 1$
- Q.1. 5 Molecular Mass of polymer is always expressed in.....term. (1)
(a) Absolute (b) Average (c) Both A & B (d) None of these
- Q.1. 6 Formaldehyde prepared by _____ process of methanol. (1)
(a) Oxidation (b) Sulfonation (c) Hydrogenation (d) Reduction
- Q.1. 7 The condensation reaction between 1,3,5-Triazine-2,4,6-triamine and Formaldehyde gives _____. (1)
(a) Polyurethane (b) Phenol formaldehyde resin
(c) Urea Formaldehyde resin (d) MF resin
- Q.1. 8 The reaction between the NCO group and Hydroxyl group gives _____ linkage (1)
(a) Ester (b) Ether (c) Amide (d) Urethane
- Q.1. 9 The reaction between the Amine group and Carboxyl group gives _____ linkage (1)
(a) Ester (b) Ether (c) Amide (d) Urethane
- Q.1. 10 Polypropylene differs from polyethylene by the presence of _____ side branches. (1)
(a) Ethyl (b) Chloride (c) Propyl (d) Methyl

Q.2 Answer the following short questions (Any Ten) (20)

- (a) Give the classification of polymer based on thermal response.
(b) Give the name of methods and techniques of polymerization.
(c) Define regulators & give its name.
(d) What is glass transition temperature?
(e) Why the molecular weights of polymer explain in terms of average value?
(f) Give the formula of sedimentation & viscosity average molecular weight.
(g) Give the reaction condition for novolac and resol.

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- (h) Write the properties of 1,3,5-Triazine-2,4,6-triamine.
- (i) Give the name & structure of the commonly used di-isocyanate for manufacturing polyurethane
- (j) Give the name of the important copolymers of styrene.
- (k) Compare the properties of LDPE & HDPE.
- (l) What are the reactants of nylon 6, 6 & Give their reactions.

Q.3 a Explain about the Emulsion polymerization techniques. (5)

Q.3 b Write the note on Living Polymers. (5)

OR

Q.3 Distinguish between Bulk polymerization and Solution polymerization process along with its advantage and disadvantage. (10)

Q.4 a Discuss the factors affecting the glass transition temperature. Justify polyethylene has lower T_g than nylon-6. (5)

Q.4 b Explain the number – average concept for averaging out the molecular weight of the polymer. (5)

OR

Q.4 a Explain the end group analysis for calculating number average molecular weight of polymer. (5)

Q.4 b Explain the light scattering method for determining molecular weight (5)

Q.5 a Write a note on Epoxy resin? (5)

Q.5 b Giving neat sketch diagram, describe the process for manufacture of polyurethane. (5)

OR

Q.5 Describe the manufacturing, properties & uses of Melamine formaldehyde resin with suitable flow diagram. (10)

Q.6 With a neat sketch of flow diagram describe the suspension process-Manufacturing of PVC. (10)

OR

Q.6 Describe the manufacturing, properties & uses of Nylon 6, 6 with suitable flow diagram. (10)

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