(23) No. of printed pages: 2

SARDAR PATEL UNIVERSITY

M.Sc. (Polymer Science & Technology) Semester-II Examination-2015

Wednesday, 22nd April, 2015
10.30 a.m. to 1.30 p.m.
PS02CPST09: Industrial Polymers

Total Marks: 70

Note: (1) Attempt all questions.
(2) Figures to the right indicate full marks.

Q.1 Write appropriate choice for the following. **(8)**

(1) Thermoplastic elastomers results from _____ cross-linking between soft blocks and hard blocks.

(a) physical (b) virtual (c) both a & b (d) None of above

(2) _____ has limited resistance to hydrolysis.

(a) Polyamide (b) Polyacetal (c) Polyimide (d) Poly carbonate.

(3) _____ is used for law shrinkage cure in unsaturated polyester resin.

(a) di-bromo styrene (b) α-methyl styrene (c) styrene (d) methyl methacrylate

(4) _____ can be used as an accelerator in epoxy curing.

(a) Isophoronediamine (b) N-amino methyl piperezine

(c) Salicylic acid (d) All of above

(5) _____ can be used as crosslinking agent in novolak.

(a) hexamethylene triamine (b) hexamethylene tetramine

(c) paraformaldehyde (d) Both b & c

(6) Polyethylenes are chemically _____in nature.

(a) acidic (b) basic (c) paraffinic (d) neutral

(7) Final cure can also be referred as _____ in UPE cross linking.

(a) primary cure (b) secondary cure (c) post cure (d) none of above

(8) Polyurethane formation is considered as _____ polymerization.

(a) addition (b) rearrangement (c) condensation (d) all of above

Q.2 Attempt any **seven** of the following **(14)**

(1) Explain pre polymer formation in polyurethane rubbers.

(2) Draw the reaction scheme of Polyacetal.

(3) Write a note on reactive diluents.

(4) Describe hardening reaction in resol.

(5) Explain about polyamide elastomer.

(6) Write only reaction scheme of acrylic acid and methacrylic acid synthesis.

(7) Give an account on properties and application of PMMA.

(8) Describe properties and application of poly(tetrafluoroethylene).

(9) Discuss monomers used in unsaturated polyester resin.

Q.3 **(a)** Explain various methods used for the synthesis of polyethylene. **(6)**

(b) Explain structure, properties, and application of poly(vinyl chloride) **(6)**

OR

(b) Give an account on any four styrene based copolymers. **(6)**

Q.4 **(a)** Discuss in detail nylon 6 manufacturing process with its reaction scheme. **(6)**

(b) Explain phosgenation and ester exchange process for polycarbonate manufacturing. **(6)**

OR

(b) Explain in detail reaction scheme, properties and application of polyimide. **(6)**

Q.5 **(a)** Give an account on curing of unsaturated polyester. **(6)**

(b) Explain amine curing reaction of epoxy resin. **(6)**

OR

(b) Write a note on following. **(6)**

(1) Reaction mechanism of epoxy resin synthesis

(2) Novolaks and Resol resin

Q.6 **(a)** What do you mean by thermoplastic elastomer (TPE)? Explain its cross linking phenomena. Give the names of various TPE. **(6)**

(b) Write a note on styrenics and polyester elastomer. **(6)**

OR

(b) Discuss resinification of melamine-formaldehyde and Furan. **(6)**

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