

SEAT No. _____

30

No. of printed pages: 2

[46]

SARDAR PATEL UNIVERSITY

M.Sc. (Polymer Science & Technology), Semester- II Examination-2018

Tuesday, 10th April, 2018

10:00 A.M. to 1:00 P.M.

PS02CPST21: Polymer Characterization

Total Marks: 70

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

Q.1 Write appropriate choice for the following. (08)

- (1) Rockwell hardness test is ASTM D _____.
(i) 783 (ii) 784 (iii) 785 (iv) 786.
- (2) _____ can affect batch to batch variation in polymerization process.
(i) Temperature (ii) Purity of monomer (iii) Time (iv) All of above.
- (3) An alternate method for measuring solvent stress cracking employs a specimen of size _____ inch.
(i) 1.5×0.5 (ii) 4×1×0.03 (iii) 4×2×0.03 (iv) 1.5×2.
- (4) Volume resistivity = _____.
(i) $\frac{A}{t(R_v)}$ (ii) $\frac{At}{\rho(R_v)}$ (iii) $\frac{A}{t(\pi R_v)}$ (iv) $\frac{At(R_v)}{\omega}$.
- (5) _____ can be used as heating media in softening point measurement techniques.
(i) Glycerol (ii) Paraffin oil (iii) Silicon oil (iv) All.
- (6) \overline{M}_n is determined by _____.
(i) GPC (ii) HSMO (iii) VPO (iv) all of above.
- (7) Polytetrafluoroethylene is highly chemical resistant because of _____.
(i) high crystalline structure (ii) lack of branching (iii) strong bond of C-F (iv) all of above.
- (8) Dielectric strength is expressed as _____.
(i) volts per thickness (ii) thickness per volts (iii) volts per temperature (iv) none of above.

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

- (1) Define gel time and peak exotherm temperature of thermosetting resin.
- (2) Differentiate between testing conditions and conditioning of test specimen.
- (3) Explain different classes of polymers on the basis of inherent flammability.
- (4) Define hardness. Explain factors affecting hardness test.
- (5) Enlist requirements of plastic for effective insulator.

- (6) Explain stress – strain plot for the polymer materials having different nature.
- (7) Write down the significance of material characterization.
- (8) What do you mean by dissipation factor? Explain.
- (9) How does thermoplastic polymers resist to sulphide staining? Explain.
- Q.3 (a) Explain in detail about gel permeation chromatography (GPC) technique. (06)
- (b) Discuss in detail about vapour phase osmometry (VPO). (06)

OR

- (b) Write a note on following. (06)
1. High speed membrane osmometry.
 2. Sedimentation velocity method.
- Q.4 (a) Discuss in detail about density gradient test for thermoplastic polymer. (06)
- (b) Explain following. (06)
1. Vicat softening point.
 2. Bubble and Brookefield viscometer.

OR

- (b) Explain following. (06)
1. Ring and ball method.
 2. Heat deflection temperature method.
- Q.5 (a) What do you mean by tensile test? Discuss in detail about test procedure and factors affecting test results. (06)
- (b) Explain following impact test. (06)
1. Izod test.
 2. Falling weight test.

OR

- (b) Describe in detail about low oxygen index test. Explain factors affecting test results. (06)
- Q.6 (a) What is dielectric strength of thermoplastics material? Explain detailed measurement procedure, diagram and factors affecting test results. (06)
- (b) Write a note on environmental stress cracking resistance test. (06)

OR

- (b) What is solvent stress cracking resistance of polymers? Explain test procedure with neat labelled diagram. (06)
