12425 3 Hours / 70 Marks

Seat No.

Instructions:

- (1) All Questions are *compulsory*.
- (2) Answer each next main Question on a new page.
- (3) Illustrate your answers with neat sketches wherever necessary.
- (4) Figures to the right indicate full marks.
- (5) Assume suitable data, if necessary.
- (6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. Attempt any FIVE of the following:

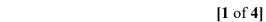
10

- (a) Define testing.
- (b) State the four examples of standards used for polymer testing.
- (c) Draw the labelled diagram of any one type of tensile test specimen along with dimensions.
- (d) State co-efficient of thermal conductivity.
- (e) Define dissipation factor.
- (f) Elaborate weathering of polymer.
- (g) State the test used to measure the resistance of polymer to specific chemical reagent.

2. Attempt any THREE of the following:

12

(a) State the various methods test specimen preparation and which method is preferred the most?



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- (b) Draw the generalized stress-strain curve and elaborate the various terms related to it.
- (c) Identify and explain the test used to measure hardness of rubber sole for shoes.
- (d) State and explain the electrical test used to determine the voltage bearing ability of polymer insulator.

3. Attempt any THREE of the following:

12

- (a) Identify and describe the test used for determination of density of powered polymer.
- (b) State and describe the loading systems used for determination of flexural strength of hard polymer and ductile polymer.
- (c) Draw the labelled diagram of VSP tester and describe its construction.
- (d) Elaborate the following terms with respect to insulator, (i) Volume resistance (ii) Surface resistance

4. Attempt any THREE of the following:

12

- (a) Explain rotary drum type abrasion resistance test.
- (b) State the effect of following factors on HDT of polymer,
 - (i) Residual stresses
 - (ii) Load
 - (iii) Rate of rise of temperature
 - (iv) Sample thickness
- (c) State the effect of following factors on dielectric strength of polymer.
 - (i) Test specimen thickness
 - (ii) Temperature
 - (iii) Electrode geometry
 - (iv) Holding time

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- (d) Describe the test used to measure the resistance of polymer to staining.
- (e) Elaborate the accelerated weathering test used for measuring the resistance of polymer to UV light.

5. Attempt any TWO of the following:

12

- (a) MSBTEMS is interested to measure the impact strength of HDPE film. State and explain the test used for determination of impact strength of HDPE film.
- (b) State MFI and describe MFI tester with neat sketch.
- (c) State refractive index and describe the refracto-meter method used for determination of refractive index of polymer.

6. Attempt any TWO of the following:

12

- (a) Describe with neat sketch the construction and working of UTM used for determination of flexural strength of polymer.
- (b) (i) Identify and state the thermal technique used to study the phase transitions in polymers.
 - (ii) Describe the test used to find out additives composition of polymer.
- (c) Explain the test used to measure the resistance of HDPE towards environmental stress cracking along with test specimen, equipment used.

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