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3 Hours / 100 Marks

Seat No.

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- 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) *Abbreviations used convey usual meaning.*
 - (6) *Assume suitable data, if necessary.*
 - (7) *Use of Non-programmable Electronic Pocket Calculator is permissible.*
 - (8) *Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.*
 - (9) *Use of Steam tables, logarithmic, Mollier's chart is permitted.*

Marks

(10×2=20)

1. Answer any ten :

- a) Why is testing of plastic necessary ? How does it differ with respect to other material testing ?
- b) What is field test ? List any one field test used for plastic product. Explain.
- c) Define creep. State the type of creep curve.
- d) Define hardness. State any two plastic products for which hardness test is necessary.
- e) Differentiate between haze and gloss.
- f) Define refractive index. Name any one plastic product for which refractive index has to be measured.
- g) Why is gloss of plastic product important ?
- h) Define dissipation factor. Write its importance.
- i) Define electrical resistivity. List the types of electrical resistivity.
- j) Suggest any two electrical applications where electrical resistivity is important.
- k) Why is stain test necessary in a plastic dinnerware ? Name any other applications where stain test is necessary.
- l) Define flammability. List the type of flammability tests.
- m) Define melt flow index. How is it related to molecular weight of a polymer ?
- n) Define a thermoset. List any two tests used to measure flow test of thermoset material.

2. Answer any four :

(4×4=16)

- a) List any two plastic products for which tensile test is necessary. Explain tensile test in brief. (1+3)
- b) Describe the vicat softening point test for plastic.
- c) Write procedure for measurement of refractive index of a plastic product.

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- d) How is arc resistance of a plastic measured ? Explain it with a sketch.
- e) What is environmental stress crack resistance ? What is its importances for which plastic ESCR test is necessary ?
- f) Explain spiral mold test to measure flow of a thermoset material.

3. Answer any four :**(4×4=16)**

- a) i) Differentiate between toughness and hardness.
ii) Define : 1) Flexural strength 2) Stress relaxation.
- b) Describe with a diagram, heat deflection temperature test.
- c) Suggest a suitable test method to measure the haze in plastic. Explain it briefly.
- d) Define dielectric strength. State method of dielectric strength measurement. State factors affecting dielectric strength.
- e) Explain in carbon arc lamp test in for plastic. Write any one application where the test becomes necessary.
- f) What is oxygen index test ? How is it different from flammability ? Write its importances.

4. Answer any four :**(4×4=16)**

- a) Describe hydrostatic pressure test used for rigid plastic pipe.
- b) Define abrasion. Describe abrasion test for plastic.
- c) Describe the “dielectric constant” measurement test for a plastic product.
- d) Explain “Xenon arc lamp” test to measure weather resistance of a plastic.
- e) What is thermogravimetric analysis ? Write its applications.
- f) What is underwriter laboratory test ? How does it differ from ASTM standard ?

5. Answer any four:**(4×4=16)**

- a) Define specification and standard. List the different types of standards. Why is ASTM standard used in plastic testing.
- b) List the types of impact tests. Explain Dart impact test in brief.
- c) Explain principle of TGA test. Why is TGA test carried out in a plastic product
- d) Write procedure to determine melt flow index of a plastic.
- e) Describe the test method to measure volume resistivity of plastic. Write its significance.
- f) Differentiate between density and bulk density. List methods used to measure density of plastic.

6. Answer any four:**(4×4=16)**

- a) Describe a method to access stress relaxation.
 - b) Explain UV lamp test conducted for a plastic product.
 - c) Explain the cup flow test to measure flow properties of thermosets.
 - d) Explain determination of thermal conductivity of a plastic product.
 - e) What is a accelerated outdoor text for plastic ? Why are these test necessary for plastic product ? List any two accelerated outdoor tests for plastic.
 - f) What is luminous transparency ? Explain its importances.
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