17548

14115

3 Hours/100 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. A) Answer **any three** : **(3×4=12)**

a) Explain the importance of testing. Give four major reasons of testing.

b) Explain general stress-strain curve with a neat figure.

c) Describe operation of parallel beam gloss-meter with a diagram.

d) Define dielectric constant of an insulating material. Write mathematical expression for it.

e) Explain with a diagram, horizontal position flammability test of a plastic.

B) Answer **any one** : **(1×6=6)**

a) Explain the method to determine tensile strength of plastic material. Draw a labelled figure of the specimen to be used. Name two factors affecting the test results.

b) i) Define heat deflection temperature of a plastic. **2**

ii) Explain the standard test method of its determination. **4**

MARKS

2. Answer **any two** : **(2×8=16)**

   a) i) Define hardness. **1**

   ii) Explain stepwise procedure to find Rockwell hardness of a plastic material. **7**

   b) i) Describe a method to determine dielectric strength of a plastic with a neat figure. **5**

   ii) State the factors affecting the test results of this method. **3**

   c) i) State the factors producing environmental stress cracking in plastics. **3**

   ii) Describe the method of determination of environmental stress cracking of plastic with a neat figure. **5**

3. Answer **any four** : **(4×4=16)**

   a) What do abbreviations : ASTM, ISO, IS, BIS stands for ? Write one function of each.

   b) Explain with a labelled diagram, the principle of drop impact test.

   c) Explain the terms ‘surface resistivity’ and ‘volume resistivity’.

   d) Explain oxygen index test with a neat figure.

   e) Describe principle involved in Thermo Gravimetric Analysis (TGA). Draw neat figure of TGA thermogram.

4. A) Answer **any three** : **(3×4=12)**

   a) Define specific gravity and density of a plastic material. State their units.

   b) i) Define refractive index. Write mathematical expression for it.

   ii) List two methods of determination of refractive index.

   c) Explain stain resistance of plastics. Enlist any four staining reagents for plastics.

MARKS

d) Explain with a neat figure the vertical position flammability test of plastic.

e) Describe principle involved in Differential Scanning Colorimetry (DSC). Draw neat figure of DSC thermogram.

B) Answer **any one** : **(1×6=6)**

a) What do you mean by vicat softening temperature ? **1**

Explain the standard test method for vicat softening temperature determination. **5**

b) Explain test procedure to calculate haze percentage with a schematic figure of a haze meter.

5. Answer **any two** : **(2×8=16)**

a) What do you mean by arc resistance of plastic material ? Describe arc resistance test with a neat figure.

b) i) Describe outdoor exposure test for studying the resistance of plastic materials to fungi and bacteria. **6**

ii) Write down the limitations of this test. **2**

c) i) Explain a test for determination of Melt Flow Index (MFI) of a plastic material. **5**

ii) Write factors affecting the test result of this method. **3**

MARKS

6. Answer **any four** : **(4×4=16)**

a) Define : Creep. Explain generalised creep curve with a diagram.

b) Distinguish between : haze and gloss.

c) Explain the test procedure for exposure of plastics to carbon arc lamp.

d) Explain spiral mold test of thermoset plastic with a neat figure of test specimen.

e) Explain burst test for rigid pipe.

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