BME-018

B.Tech. MECHANICAL ENGINEERING (COMPUTER INTEGRATED MANUFACTURING) / B.Tech. AEROSPACE ENGINEERING (BTAE) / BTMEVI Term-End Examination June, 2018

00933

BME-018 : ENGINEERING MATERIALS

Time : 3 hours   *Maximum Marks : 70*

Note : *Answer any* **five** *questions. All questions carry equal marks. Use of calculator is allowed.*

1. Define modulus of resilience, modulus of elasticity and modulus of toughness. A steel specimen of 10 mm diameter and 50 mm gauge length was tested in tension and following observations are recorded :

    Load at Upper yield point = 20600 N

    Load at Lower yield point = 19650 N

    Maximum Load = 35550 N

    Gauge length after fracture = 62·43 mm.

    Calculate modulus of resilience and modulus of toughness. Also calculate % of elongation. $E = 210 \times 10^3$ N/mm^2. *14*

2. Draw the Iron-Carbon equilibrium diagram and label the compositions and temperatures. Explain various transformations in the diagram with the help of suitable examples. *14*

3. Distinguish between : *7+7*

   (a) Verification and Compaction

   (b) Hot pressing and Pyrolysis

4. Describe different types of adhesives and their properties. What are the different types of adhesive joints ? Give their merits and demerits. *14*

5. Describe various types of cracks. Consider a plate of length 15 mm, width 25 mm and plate thickness 2 mm. For the load of 1000 N, the crack length is 5 mm. Calculate the stress intensity. *8+6*

6. Classify surface coating methods. Explain any four in detail, with the help of neat diagrams. *2+3×4 =14*

7. Write short notes on any *four* of the following : $4 \times 3\frac{1}{2} = 14$

   (a) Rockwell Hardness

   (b) TTT Diagrams

   (c) Ceramics

   (d) Natural Polymers

   (e) Griffith's Criterion of Fracture

   (f) Properties of Lubricants