

ENGINEERING MATERIALS

(Code : MET-302)

Full Marks : 70

Time : 3 hours

Answer any five questions

Figures in the right-hand margin indicate marks

- 1. (a) Define a metal. 2
- (b) How do you classify materials for engineering use? 5
- (c) Define "Mechanical Property" of an engineering material. State any six mechanical properties, give their definitions and one example of the material possessing the properties. 7
- 2. (a) List the principal iron ores and give the chemical symbols for each. 2

- (b) Distinguish clearly amongst cast iron, wrought iron and steel regarding their constituents and properties. 5
- (c) State the alloying elements added to steel to get alloy steels and the effect they produce. Give at least one example of each. 7
- 3. (a) What different kinds of iron are produced? 2
- (b) Write short notes on : 5
 - (i) Stainless steels
 - (ii) High-speed steels.
- (c) How cast iron is obtained? Classify and explain different types of cast irons. 7
- 4. (a) What is meant by crystal imperfections? State the effect of their presence in materials. 2
- (b) Discuss different types of point defects. 5
- (c) Distinguish between edge dislocation and screw dislocation. 7

(Turn Over)

(3)

5. (a) What is an equilibrium diagram ? 2
- (b) Describe an "iron-carbon equilibrium diagram" and state the micro-constituents that are obtained in the transformations in iron indicating their character. 5 + 7
6. (a) What are the major types of case hardening ? 2
- (b) What are the difference between hardening and tempering ? 5
- (c) Name the various alloys of copper and comment on their importance in industries. 7
7. (a) Give two examples of Non-Ferrous alloys. 2
- (b) Write down composition, properties and uses of Iron-Base spring material. 5
- (c) Differentiate between thermosetting and thermoplastic polymer. 7

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