

17303

**11718**

**3 Hours / 100 Marks**

Seat No.

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- Instructions :**
- (1) All Questions are *compulsory*.
  - (2) Illustrate your answers with neat sketches wherever necessary.
  - (3) Figures to the right indicate full marks.
  - (4) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

**Marks**

**1. Attempt any TEN of the following :**

**10 × 2 = 20**

- (a) Define creep and fatigue.
- (b) What is pearlite ?
- (c) Write four advantages of alloy steel.
- (d) State the objectives of heat treatment.
- (e) Define Carburizing.
- (f) Classify the steel.
- (g) Write applications of high carbon steel.
- (h) State the meaning of “45Cr9Si4”.
- (i) Write the applications of duralium.
- (j) What is acrylic ? State its applications.
- (k) What is sintering ?
- (l) State the limitations of powder metallurgy.

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**2. Attempt any FOUR of the following :****4 × 4 = 16**

- (a) Give the characteristics of Ferrous metals.
- (b) How metals are classified ? Name any two types of C.I.
- (c) Give typical slip planes and direction of FCC and BCC metals.
- (d) Draw iron-carbon equilibrium diagram and label it.
- (e) Write the properties and applications of Wrought iron.
- (f) Define 'Pig iron'. State the types of pig iron with their properties.

**3. Attempt any FOUR of the following :****4 × 4 = 16**

- (a) Define annealing. State its purpose and explain how full annealing is carried out.
- (b) Compare flame hardening and induction hardening process.
- (c) State advantages and limitations of tempering.
- (d) Explain the principles of heat treatment.
- (e) What is Martempering ? Explain.
- (f) What is nitriding ? What are its advantages and limitations ?

**4. Attempt any FOUR of the following :****4 × 4 = 16**

- (a) Explain Spheroidising with its advantages.
- (b) Differentiate between White cast iron and Grey cast iron.
- (c) State any four properties and uses of stainless steel.

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- (d) State the effect of following alloying elements on steel :
- (i) Phosphorus
  - (ii) Sulphur
  - (iii) Silicon
  - (iv) Chromium
- (e) What do you mean by 18 : 4 : 1 tool steel ? Where it is used ?
- (f) State the types of cast iron and draw the microstructure of the same.

5. Attempt any FOUR of the following :

4 × 4 = 16

- (a) Give the IS specification for
- (i) Grey cast iron
  - (ii) Tool steel
- (b) Give the properties of Bearing materials.
- (c) What is copper ? State its properties and applications.
- (d) Give composition and two applications of gun metal.
- (e) State the characteristics and applications of ABS.
- (f) Explain laminated composite and fibre reinforced composites.

6. Attempt any FOUR of the following :

4 × 4 = 16

- (a) Differentiate between thermoplastics and thermosetting plastics.
- (b) Give any two applications in industry of (i) Polysters (ii) Epoxies.

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- (c) Explain the compacting process in powder metallurgy.
  - (d) Differentiate between destructive and non-destructive testing.
  - (e) Why different alloying elements are used in steel ? Explain with suitable example.
  - (f) Differentiate between Annealing and Normalizing.
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