

# 17303

**21314**

**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) Assume suitable data, if necessary.
  - (5) Use of Non-programmable Electronic Pocket Calculator is permissible.
  - (6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

**Marks**

1. Attempt any **TEN** of the following: **20**
- a) Define hardness and toughness.
  - b) State the meaning of 40 Cr4 MO<sub>2</sub>.
  - c) State the percentage of carbon in low carbon steel.
  - d) State the purpose of normalising.
  - e) State any four objectives of heat treatment.
  - f) Why different alloying elements are used in tool steel?
  - g) State any two applications of gray cast iron.
  - h) What is bronze? Classify it.
  - i) Give any two applications of gun metal.
  - j) State the applications of polyster (any four).
  - k) Classify the types of polymer materials.
  - l) State the different powder making process.

P.T.O.

- 2. Attempt any FOUR of the following:** **16**
- a) Draw flow diagram for production of iron and steel.
  - b) With neat sketch explain solidification of a pure metal and alloys.
  - c) Define “Heat treatment”. State the need of heat treatment.
  - d) What is stainless steel? State its any two properties and applications.
  - e) Describe Y-alloy with their chemical composition. State their uses also.
  - f) Give two applications of:
    - i) Ceramics
    - ii) Asbestos.
- 3. Attempt any FOUR of the following:** **16**
- a) Describe laminated and reinforced composites.
  - b) Describe spheroidise annealing in brief.
  - c) What is cast iron? Give its classification.
  - d) What are required properties of bearing material?
  - e) What is white metal? State its applications.
  - f) Describe nitriding process.
- 4. Attempt any FOUR of the following:** **16**
- a) Describe flame hardening with its principle and neat sketch.
  - b) Define pig iron. State its types with their properties.
  - c) What is meant by HSS? What are its characteristics?
  - d) Describe X-ray radiography with neat sketch.
  - e) State the advantages and disadvantages of powder metallurgy.
  - f) State the different properties of composites material (any four).

- 5. Attempt any FOUR of the following:** **16**
- a) State and describe steels which are used as tool steels..
  - b) What is carburising? State two merits and demerits of carburising.
  - c) List the special cutting tool materials with its two characteristics.
  - d) Describe with neat sketch isomorphous system.
  - e) Differentiate between martempering and austempering.
  - f) Describe any one powder making process.
- 6. Attempt any FOUR of the following:** **16**
- a) Compare annealing with normalising (any four points).
  - b) How steels are classified?
  - c) Define ferrous metals and classify the same.
  - d) Differentiate between destructive and non-destructive testing.
  - e) Give the chemical composition of the following copper alloys.
    - i) Naval brass
    - ii) Muntz metal
    - iii) Gun metal
    - iv) Bronze.
  - f) What do you mean by case hardening? State its advantages.
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