

# 22307

**12425**

**03 Hours / 70 Marks**

Seat No.

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- Instructions* – (1) All Questions are *Compulsory*.  
(2) Answer each next main Question on a new page.  
(3) Illustrate your answer 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. Attempt any FIVE of the following:** **10**
- List any four types of engineering materials.
  - State any four purposes of heat treatment.
  - State the different types of foundries.
  - Write the selection criteria for cutting tools.
  - List any four types of cutting fluid.
  - Draw the neat sketch of column and knee type milling machine.
  - Write the uses of mandrels.

P.T.O.

- 2. Attempt any THREE of the following:** **12**
- a) Differentiate between thermoplastic and thermosetting plastics. (Any four points)
  - b) Describe carburizing process with its applications.
  - c) State and explain the desired properties of moulding sand.
  - d) Draw neat sketch of bench drilling machine and name its parts. Write functions of any two parts in brief.
- 3. Attempt any THREE of the following:** **12**
- a) State compositions and properties of tool steels.
  - b) Explain the effects of nickel, chromium, silicon, molybdenum addition on the properties of steel.
  - c) Illustrate the iron-iron carbide (Fe-Fe<sub>3</sub>C) diagram showing critical temperature on it.
  - d) Explain the importance of pattern allowances and state various pattern allowances.
- 4. Attempt any THREE of the following:** **12**
- a) State various types of cast iron and give applications of each.
  - b) Describe annealing process with its significance in automobile sector.
  - c) Compare flame hardening and induction hardening. (Any four points)
  - d) Describe the working of centrifugal casting with its advantages.
  - e) Explain any four defects in casting and give remedies for it.
- 5. Attempt any TWO of the following:** **12**
- a) Explain single point cutting tool nomenclature with neat sketch.
  - b) Explain tool signature with example.
  - c) Explain the taper turning method by swivelling the compound rest method.

**6. Attempt any TWO of the following:****12**

- a) List the different types of chips formed during machining? Explain any one with neat sketch.
  - b) State the necessity of chucks. List various types of chucks used in lathe. Describe any one in brief.
  - c) Choose proper milling cutter on milling machine for following operations with justification:
    - i) Key way
    - ii) Angular surface
    - iii) Parting off.
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