

# 22307

11819

**3 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 answers 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**
- a) List four types of cast iron.
  - b) State two purposes of heat treatment.
  - c) Define the term casting.
  - d) State four properties of cutting fluids.
  - e) Enlist different types of chips formed during machining.
  - f) List the main four parts of a lathe.
  - g) State four operations performed by lathe.
2. **Attempt any THREE of the following:** **12**
- a) Describe plain carbon steel with its applications.
  - b) Describe normalizing process with its purpose.
  - c) Explain sweep moulding process with sketch.

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- d) Explain the taper turning method by swivelling the compound rest method.

**3. Attempt any THREE of the following: 12**

- a) Describe thermoplastic with its properties.  
b) Identify the properties of material used for connecting rod with justification.  
c) Explain flame hardening process with neat sketch.  
d) Explain hot chamber die casting process with neat sketch.

**4. Attempt any THREE of the following: 12**

- a) Identify the need of advanced materials in automobile sector.  
b) Illustrate the Iron-Iron carbide (Fe-Fe<sub>3</sub>C) diagram showing critical temperatures on it.  
c) Apply proper heat treatment process for manufacturing connecting rod of an engine.  
d) Identify the causes of generating blow holes and misrun in casting and also suggest remedies to avoid them.  
e) Use suitable pattern for producing circular parts in foundry.

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

- a) Describe the mechanism of chip formation during metal cutting with the help of sketch.  
b) Differentiate between orthogonal and oblique cutting with sketch.  
c) Write the suitable cutter for carrying following operations on milling machine:  
(i) Gear tooth  
(ii) Parting off  
(iii) Keyway  
(iv) V-Grooves  
(v) Rounding of corner  
(vi) Cutting of narrow slot and groove.

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**Marks**

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

**12**

- a) Describe the single point cutting tool with its nomenclature.
- b) Choose proper machine tool and explain operation method for the following:
  - (i) Producing a hole
  - (ii) Finishing previously drilled hole
- c) Describe with neat sketch specification of lathe machine.

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