

# 17306

**21314**

**3 Hours / 100 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. a) Attempt any **SIX** of the following: 12
- i) What is ferrous metal? Give any two examples of it.
  - ii) State the compositions of plain carbon steel and also state where it is used?
  - iii) What is 'Y' alloy? State its two uses.
  - iv) State two engineering applications of gun metal and babbitt metal.
  - v) What is rubber? State its types.
  - vi) State any two properties and applications of ceramic material.
  - vii) What is thermoplastic? State its two properties.
  - viii) Define heat treatment. Give its two objectives.

P.T.O.

b) **Attempt any TWO of the following:****8**

- i) How engineering materials are classified? Give example of each.
- ii) What is aluminium? State its properties and applications.
- iii) Give any four properties of epoxy resins? State any four uses of it.

**2. Attempt any FOUR of the following:****16**

- a) Draw iron - iron carbide, phase equilibrium diagram and label it.
- b) Compare between flame hardening and induction hardening.
- c) What is normalizing? State its four objectives.
- d) What is case carburizing? Give four applications of case carburizing.
- e) State any two advantages and two disadvantages of foundry process.
- f) What is pattern? State the different pattern materials.

**3. Attempt any FOUR of the following:****16**

- a) State the different types of pattern. Explain split piece pattern with neat sketch.
- b) What are different pattern allowances? Explain any two in detail.
- c) State any four types of moulding sand and list their properties.
- d) Explain with neat sketch any two moulding tools.
- e) What is sand moulding process? Explain the general steps taken for it.
- f) What is the purpose of gating and risers in sand casting? Explain with sketch.

- 4. Attempt any FOUR of the following:** **16**
- a) Explain with neat sketch hot chamber pressure die casting.
  - b) State any four casting defects and remedies to avoid them.
  - c) Differentiate between orthogonal cutting and oblique cutting.
  - d) What are the different types of chips? Explain with sketch chip formed during machining cast iron.
  - e) What is tool signature? Explain it with example.
  - f) What are different types of tool material? State their properties.
- 5. Attempt any FOUR of the following:** **16**
- a) Why cutting fluids are used in machining of metals? State the different types of cutting fluids used.
  - b) How lathe machines are classified?
  - c) State the different operations that can be performed on lathe machine. Explain how taper turning operation is performed.
  - d) How lathe machines are specified? Enlist the major parts of centre lathe machine.
  - e) State any four accessories used on lathe machine. Explain with neat sketch use of three jaw chuck.
  - f) How drilling machines are classified? List the major parts of bench drilling machine.

**6. Attempt any FOUR of the following:****16**

- a) Explain drilling and reaming operation with neat sketch.
  - b) State the various milling operations and explain with sketch face milling operation.
  - c) What is working principle of milling? State the type of milling machines.
  - d) Explain with neat sketch plain side milling cutter and double angle milling cutter.
  - e) What is gang milling? Explain gang milling operation with neat sketch.
  - f) Suggest the type of cutter to be used for following operations on milling machines.
    - i) Thin slot
    - ii) Flat surface
    - iii) Irregular contours
    - iv) Key way.
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