

# 22307

**21819**

**3 Hours / 70 Marks**

Seat No.

--	--	--	--	--	--	--	--

- 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 FIVE of the following:** **10**
  - a) State the need of advanced materials in making of automobile components.
  - b) Define phase and phase diagram.
  - c) State any two advantages and disadvantages of foundry process.
  - d) Define cutting speed and feed in metal cutting process.
  - e) State any four properties of cutting fluids.
  - f) Define machine tool.
  - g) List any four drilling machines used in industrial sector.

P.T.O.

- 2. Attempt any THREE of the following: 12**
- a) Classify engineering materials with the examples.
  - b) State any four objectives of heat treatment.
  - c) Describe the steps in sand casting process.
  - d) Explain the lathe specification or size of lathe.
- 3. Attempt any THREE of the following: 12**
- a) Discuss the properties and applications of Ti-6Al-4V titanium alloy.
  - b) State the effects of alloying elements on properties of steel.
  - c) Describe full annealing process with its significance.
  - d) Describe shell moulding process with its applications.
- 4. Attempt any THREE of the following: 12**
- a) Differentiate thermoplastic and thermosetting polymers.
  - b) Illustrate the iron-carbide (Fe-Fe<sub>3</sub>C) diagram showing critical temperatures on it.
  - c) Explain match plate pattern with its significance.
  - d) Use suitable pattern allowance to compensate the shrinkage problem during casting process.
  - e) Explain the significance of gating system in casting process with the sketches.

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

- a) Write type of chip formed with following factors.
  - (i) High rake angle
  - (ii) High cutting speed
  - (iii) Small depth of cut
  - (iv) Low cutting speed
  - (v) Large depth of cut
  - (vi) Low rake angle.
- b) Explain the nomenclature of a single point cutting tool.
- c) Explain properties and applications of GRP and CRP composites.

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

- a) Sketch the block diagram of bench drilling machine showing its different parts.
  - b) Explain taper turning operation for a job having following dimensions.

(D) Diameter of work piece = 50 mm  
Reduced diameter (d) = 30 mm  
Taper length (L) = 60 mm
  - c) Suggest and sketch a milling cutter for following milling operations.
    - (i) Face milling
    - (ii) Key- way milling
    - (iii) 'T' slot
-