

# 17306

16172

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) 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. (A) Attempt any SIX of the following :

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- (a) Classify plain carbon steel.
- (b) State the effect of Nickel & Silicon as alloying elements.
- (c) State any two properties & applications of copper.
- (d) State the necessity of tempering.
- (e) Define heat treatment. Give its objectives.
- (f) List any four properties of polymeric materials.
- (g) Write the chemical composition of gun metal.
- (h) Differentiate between natural rubber & synthetic rubber.

- (B) Attempt any TWO of the following :** **8**
- (a) Classify various aluminium alloys. Write composition & applications of any two Al alloys.
  - (b) Differentiate between thermoplastic & thermosetting plastics.
  - (c) What are tool steels ? Give any two applications of tool steels.
- 2. Attempt any FOUR of the following :** **16**
- (a) Write the advantages of alloy steel over plain carbon steel.
  - (b) Explain : (i) Tempering, (ii) Normalizing.
  - (c) Compare Flame Hardening & Induction Hardening.
  - (d) Draw Fe-C phase transformation diagram & show critical temperature on it.
  - (e) What is nitriding ? Write advantages and limitations of nitriding.
  - (f) Explain colour coding of patterns.
- 3. Attempt any FOUR of the following :** **16**
- (a) Enlist the types of pattern. Explain any one with neat sketch.
  - (b) Explain any two moulding tools with neat sketch.
  - (c) Explain centrifugal casting with neat sketch.
  - (d) Explain different elements of gating system with neat sketch.
  - (e) State the types of cores. Explain any one with neat sketch.
  - (f) Write any four casting defects, their causes & remedies.

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

- (a) Write down basic steps of casting process.
- (b) State any four types of moulding sand & enlist their properties.
- (c) Name the different allowances provided on pattern. Explain any one.
- (d) What is tool signature ? Explain with example.
- (e) Draw neat labelled sketch of single point cutting tool nomenclature.
- (f) Write the name of any four cutting fluids & any four properties of cutting fluids.

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

- (a) Name the different types of chips formed during machining. Explain any one with neat sketch.
- (b) State different types of cutting tool materials. Write selection criterion for cutting tools.
- (c) State any four accessories used on lathe and state their uses.
- (d) Draw the block diagram of centre lathe. Show major parts on it.
- (e) What is taper ? How taper angle is calculated ?
- (f) Explain with neat sketch following operations :
  - (i) Facing, (ii) Knurling

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

- (a) How drilling machines are classified ? State major parts of bench drilling machine.
- (b) Explain with neat sketch : (i) Counter sinking, (ii) Counter boring

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- (c) Draw the neat labelled sketch of Taper Shank Twist Drill.
  - (d) Explain with neat sketch Key-way milling operation.
  - (e) Enlist the major part of column & knee type milling machine. State their functions.
  - (f) Which cutter you will use for carrying following operations on milling :
    - (i) Gear Tooth
    - (ii) Parting off
    - (iii) Keyway
    - (iv) V-Grooves
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