



17306

21415

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.
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MARKS

1. A) Attempt **any six** of following :

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- a) List any four types of cast iron.
- b) Classify plain carbon steel.
- c) What is 18-4-1 H.S.S. ?
- d) List two properties and applications of brass that make it useful engineering material.
- e) What is thermoplastic ? Give two examples.
- f) Differentiate between natural rubber and synthetic rubber.
- g) State any two properties of Epoxy resin.
- h) Give two different properties of ceramic materials and two industrial applications of it.

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**MARKS**B) Attempt **any two** of following :**8**

- a) What is an alloy steel ? Write the effect of any two alloying elements on steel.
- b) Write composition and application of gun metal.
- c) Differentiate between thermoplastic and thermo-setting plastic.

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

- a) Draw the Iron-Carbon equilibrium diagram and showing critical temperatures on it.
- b) Differentiate between annealing and normalizing.
- c) What is Nitriding ? Give advantages and limitations of nitriding.
- d) Compare flame hardening and induction hardening as surface hardening processes.
- e) What are different types of foundries ? Explain any one in brief.
- f) Describe standard colour coding used in pattern.

3. Attempt **any four** of following :**16**

- a) List any four types of pattern. State any four factors for the selection of pattern material.
- b) List various allowances provided on pattern. Explain any two in brief.
- c) Draw any two moulding tools with simple sketch and explain its use.
- d) State the different properties of moulding sand.
- e) What is core print ? Explain any two types of core print with sketch.
- f) Give advantages and limitations of shell moulding process.



**MARKS**

4. Attempt **any four** of following : **16**

- a) What is the purpose of Gating System in case of casting ? Explain with sketch.
- b) Explain any two defects in casting with its cause and remedies.
- c) Explain different types of chips observed while machining.
- d) Compare “orthogonal and oblique cutting”.
- e) Draw a neat sketch of single point cutting tool and show the different parts and angles on it.
- f) What are different types of tool materials ? State their specific use.

5. Attempt **any four** of following : **16**

- a) You are going to machine mild steel on lathe which type of tool material you will select considering following parameters ?
  - 1) Ease in machining
  - 2) Long life of tool
  - 3) Surface finish.
- b) How lathe machine is specified ?
- c) State any four accessories used on lathe. Explain with neat sketch the use of any two accessories.
- d) Explain taper turning operation performed on lathe by swivelling the compound rest.
- e) What is working principle of lathe ? How lathe machine is classified ?
- f) Draw neat sketch of bench drilling machine and name its parts also write function of any two parts.



6. Attempt **any four** of following :

**16**

- a) Explain counter sinking and counter boring operation with neat sketch.
  - b) How are the milling machines classified ?
  - c) Draw a neat sketch of column and knee type milling machine and explain function of any two parts.
  - d) What are the different standard milling cutters ? Describe suitability of any two.
  - e) What is the working principle involved in a 'Milling Operations' ? List various milling operations.
  - f) Give which cutter you will use for carrying following operations on milling :
    - i) Keyway
    - ii) V-grooves
    - iii) Parting off
    - iv) Gear tooth.
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