

17306

11718

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 :

12

- (a) How engineering materials are classified ?
- (b) Write composition and use of Grey cast iron.
- (c) What is Babbit metal ? Where it is used ?
- (d) Write properties of duralumin. State its application.
- (e) State two properties of Nylon.
- (f) List two applications of ceramic materials in automotive industry.
- (g) Compare Natural rubber with Synthetic rubber.
- (h) What is phase transformation ? Give one example.

(B) Attempt any TWO :

8

- (a) Write effect of Nickel and Chromium on properties of alloy steel.
- (b) Write composition, properties and applications of Y-alloy.
- (c) What is thermosetting plastic ? Write properties and use of Epoxy resins.

2. Attempt any FOUR :**16**

- (a) Draw a neat sketch of Fe-Fe₃C equilibrium diagram and show various phases and critical temperatures on it.
- (b) Write purpose and process sequence of annealing.
- (c) Explain nitriding process and state its advantages over carburising.
- (d) Explain advantages, limitations and use of cyaniding.
- (e) Write factors governing selection of pattern materials. List any four pattern materials.
- (f) Write advantages and disadvantages of foundry process.

3. Attempt any FOUR :**16**

- (a) Explain colour coding of pattern. State its importance.
- (b) Explain cope and drag pattern with sketch.
- (c) List any five moulding tools and explain any two of them with sketch.
- (d) Write sand composition for typical green sand moulding with function of ingredients.
- (e) Explain core and core print used in moulding.
- (f) Write causes and remedies for 'blow holes' and 'cold shut' in casting.

4. Attempt any FOUR :**16**

- (a) Explain pressure die casting principle and state its applications in automobile industry.

- (b) Write functions of gating and risering system.
- (c) Compare orthogonal cutting and oblique cutting.
- (d) Explain mechanism of chip formation with sketch.
- (e) Discuss properties and types of cutting fluids.
- (f) Sketch single point cutting tool and write tool signature.

5. Attempt any FOUR :

16

- (a) How cutting tool is selected ? Compare single point tool with multi-point tool.
- (b) Explain taper turning on lathe machine by any one method.
- (c) How a centre lathe is specified ?
- (d) List any four lathe accessories and write their functions.
- (e) Draw a block diagram of lathe machine and show major parts.
- (f) How drilling machines are classified ?

6. Attempt any FOUR :

16

- (a) Explain bench drilling machine with block diagram.
- (b) Sketch a standard milling cutter and show its nomenclature. State functions of various angles.
- (c) Name major parts of universal milling machine and write their functions.
- (d) How milling machines are classified ?
- (e) Explain gang milling and end milling with sketch.

P.T.O.

17306

[4 of 4]

(f) You are going to carry following operations on milling. Give which cutter you will use for them :

- (i) Gear tooth
 - (ii) Parting off
 - (iii) Keyway
 - (iv) Rounding of corner
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