

17306

16117

3 Hours / 100 Marks

Seat No.

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- 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.

Marks

1. (A) Attempt any SIX of the following : **12**
- (a) State any four types of Engineering materials.
 - (b) Give the composition of gray cast iron. State any two applications of it.
 - (c) State any four properties of aluminum.
 - (d) Give the composition of bronze with any two applications.
 - (e) State any two properties of Epoxy. Give any two applications of it.
 - (f) What are the basic types of rubber ? Give one application of each.
 - (g) State any four applications of ceramic material.
 - (h) Define phase diagram.
- (B) Attempt any TWO of the following : **08**
- (a) What is alloy steel ? Give composition of any one alloy steel with its properties and applications.
 - (b) List any four alloys of copper. Explain any two with its composition and applications.
 - (c) Differentiate between thermosetting, plastics and thermoplastics.

- 2. Attempt any FOUR of the following : 16**
- (a) Draw the Iron-Iron carbide phase equilibrium diagram and show critical temperatures on it.
 - (b) Define heat treatment. State any four types of heat treatment. State any four general purposes of heat treatment.
 - (c) What is the need of tempering ? Explain the process of tempering in brief.
 - (d) Differentiate between flame hardening and induction hardening.
 - (e) What are the advantages and disadvantages of foundry process ?
 - (f) What is pattern ? State any six desired properties of pattern material.
- 3. Attempt any FOUR of the following : 16**
- (a) Sketch any two types of patterns and explain each in brief.
 - (b) State different allowances provided on pattern. Explain any two in brief.
 - (c) Classify moulding processes. Explain any one in detail.
 - (d) State and explain the desired properties of moulding sand.
 - (e) Explain any two hand moulding tools with simple sketch.
 - (f) What are the functions of gating system in casting ? Draw and show four components of gating system in casting.
- 4. Attempt any FOUR of the following : 16**
- (a) What is pressure die casting ? Explain hot chamber die casting with neat sketch.
 - (b) Give any two defects in casting with its causes and remedies.
 - (c) What is the mechanism of chip formation during metal cutting ?
 - (d) Differentiate between orthogonal and oblique cutting.
 - (e) State and describe the desired properties of cutting tool material.
 - (f) Draw a neat sketch of single point cutting tool and show the different nomenclature on it.

5. Attempt any FOUR of the following : 16

- (a) What is the effect of positive rake angle and negative rake angle on the performance of single point cutting tool ?
- (b) How the lathe machine is specified ?
- (c) Explain taper turning by swiveling compound rest with neat sketch.
- (d) List the principle parts of centre lathe. State the functions of any two parts.
- (e) State any four accessories used on lathe. Explain any one with neat sketch.
- (f) Draw neat sketch of bench drilling machine and name its parts. Write functions of any two parts in brief.

6. Attempt any FOUR of the following : 16

- (a) List any four operations that can be performed on drilling machine. Explain any one with sketch.
 - (b) Give detailed classification of milling machine.
 - (c) Draw neat sketch of column and knee type milling machine and explain function of any two parts in brief.
 - (d) What is gang milling ? Explain with neat sketch.
 - (e) State any four types of milling cutters. Explain any one with simple sketch.
 - (f) Suggest appropriate milling cutters for following operations :
 - (i) Gear tooth
 - (ii) Cutting of narrow slot and groove
 - (iii) T-slot
 - (iv) Key seat for sunk key.
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