

12051

21112

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) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

- | | Marks |
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| 1. Attempt any TEN of the following : | 10 × 2 = 20 |
| (a) What is a ferrous metal ? State its classification. | |
| (b) List eight alloying element that improves properties of steel. | |
| (c) Write classification of heat treatment processes. | |
| (d) State any four purposes of annealing. | |
| (e) Why risers are provided in mould ? | |
| (f) State four factors on which pattern material selected. | |
| (g) What is chip breaker ? | |
| (h) Define : (i) Depth of cut (ii) Speed & feed | |
| (i) List types and grades of knurling process. | |
| (j) State any four types of drilling machines. | |
| (k) Write the function and one example of additives and binders. | |
| (l) Write four functions of cutting fluid. | |

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2. Attempt any FOUR of the following :

4 × 4 = 16

- (a) Write compositions of the following metals :
 - (i) FG 35 Si 15
 - (ii) XT 35 Cr 5 Mo 1 V3
- (b) Write compositions and properties of Babbitt metal.
- (c) Draw a neat sketch of blast furnace. Show the zones and temperature on it.
- (d) What is 18 : 4 : 1 H.S.S. ? Where is it used ?
- (e) Differentiate between grey cast iron and white cast iron.
- (f) State properties and applications of natural rubber and synthetic rubber.

3. Attempt any FOUR of the following :

4 × 4 = 16

- (a) Define following properties of metals :
 - (i) Creep
 - (ii) Plasticity
 - (iii) Toughness
 - (iv) Fatigue
- (b) What is heat treatment ? Write the purposes of heat treatment.
- (c) Draw a neat labelled sketch of iron-carbon phase transformation diagram. Show critical temperatures on it.
- (d) Give classification of engineering materials.
- (e) Write the procedure for heat treatment used for crankshaft.
- (f) State four allowances provided on patterns. Explain distortion allowance.

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4. Attempt any FOUR of the following :

4 × 4 = 16

- (a) Explain tempering process.
- (b) State four properties of foundry sand. Explain refractoriness.
- (c) Write types of patterns. Explain pattern with loose piece with neat sketch.
- (d) Write the standard accepted colour codes for pattern.
- (e) List four hand tools used in hand moulding. Explain shovel and trowel with neat sketch.
- (f) State defects in casting. What are the causes of blow holes ?

5. Attempt any FOUR of the following :

4 × 4 = 16

- (a) Explain true centrifugal casting with neat labelled sketch.
- (b) What is core ? List four types of cores.
- (c) Draw a neat sketch of single point cutting tool. Define nose angle.
- (d) Explain Taper turning by swivelling the compound rest method.
- (e) State four properties of cutting fluid.
- (f) List types of chips. Explain continuous chip with built up edge.

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6. Attempt any FOUR of the following :

4 × 4 = 16

- (a) State design consideration in pattern making.
 - (b) Explain geometry of a twist drill with neat and labelled sketch.
 - (c) List eight operations performed on drilling machine. Explain counter sinking with neat sketch.
 - (d) How the size of a centre lathe is specified ?
 - (e) Sketch block diagram of lathe showing its parts. Write functions of tail stock and carriage.
 - (f) Write the procedure of cutting threads on screw used in screw jack.
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