

22338

24225

3 Hours / 70 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.
 - (5) Use of Non-programmable Electronic Pocket Calculator is permissible.

Marks

1. Solve any FIVE of the following :

10

- (a) Draw a neat sketch of mechanism of metal cutting.
- (b) Define tool signature.
- (c) Draw a neat sketch of counter sinking operation performed on drilling machine.
- (d) Define down milling.
- (e) List the various types of grinding wheels.
- (f) List the gear manufacturing methods.
- (g) List the basic parts of horizontal broaching machine.

2. Solve any THREE of the following :

12

- (a) A plain surface 60 mm wide and 180 mm long is to be milled on a horizontal milling machine with cutter diameter 80 mm and cutting speed 50 m/min. Take feed per tooth as 0.12 mm and number of teeth on cutter as 12. Calculate machining time.
- (b) Describe selection procedure of grinding wheel.
- (c) Explain gear hobbing with its advantages.



- (d) A hole of 35 mm diameter and 70 mm depth is to be drilled. Consider feed as 1.5 mm/rev and cutting speed as 30 m/min. assuming suitable tool approach and lower traevel, calculate machining time.

3. Solve any THREE of the following :

12

- (a) Draw neat sketch of radial drilling machine and write function of each part.
- (b) Describe the grinding wheel dressing and truing process.
- (c) Explain simple indexing with suitable example.
- (d) Explain universal dividing head with neat sketch.

4. Solve any THREE of the following :

12

- (a) Describe the following drilling machine operations with neat sketch :
 - (i) Reaming
 - (ii) Spot facing
- (b) Determine the indexing crank movement for compound indexing for 87 divisions.
- (c) Describe with neat sketch the elements of internal pull broach.
- (d) Describe the basic parts of horizontal boring machine with its functions.
- (e) Compare pull broach and push broach.

5. Solve any TWO of the following :

12

- (a) Find the time required for one complete cut on a workpiece 325 mm long and 35 mm diameter. The cutting speed is 40 m/min and feed is 0.6 mm/rev.
- (b) State the nomenclature of standard milling cutter with sketch.
- (c) Select the suitable grinding process for grinding needle of fuel injector, justify.

6. Solve any TWO of the following :

12

- (a) Explain the thread cutting operation on lathe machine with neat sketch.
 - (b) Compare up milling and down milling (any six points).
 - (c) Explain with neat sketch, working of surface grinding machine.
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