

22338

22223

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

**Marks**

1. **Attempt any FIVE of the following:** **10**
- Define Taper.
  - State any four operations which can be performed on a lathe machine.
  - List various types of drilling machines.
  - List various milling machine operations.
  - List the parameters that are considered in grinding, wheel designation.
  - List the different methods of indexing.
  - List the types of boring machines.

P.T.O.

- 2. Attempt any THREE of the following:** **12**
- a) A plain worksurface of about 80mm width × 240mm length, is to be machined on horizontal milling machine. Machining is to be carried out with cutter of 80mm diameter and cutting speed of 60m/min. Considering total number of teeth on cutter as 12 and feed per tooth as 0.1mm, Calculate total machining time required to machine the surface.
  - b) State the importance of balancing the grinding wheel.
  - c) Explain how gears can be manufactured by gear hobbing process.
  - d) A hole of 20mm diameter is to be drilled through a mild steel plate of 50mm thickness. The cutting speed is 30m/min and feed is 0.10mm/rev. Estimate the time required to drill a hole with approach and over fraud of 3mm each.
- 3. Attempt any THREE of the following:** **12**
- a) Explain covnter-boring and counter sinking operations with sketch.
  - b) Explain the need of dressing and truing of grinding wheel.
  - c) Explain with neat sketch rack cutter gear generating process.
  - d) Index an angle  $20^{\circ}45$  by angular indexing.
- 4. Attempt any THREE of the following:** **12**
- a) Explain reaming operation performed on drilling machine with a neat sketch.
  - b) Explain procedure to set the dividing head to mill 40 teeth on a spur wheel blank.
  - c) Explain how broaching machines are specified.
  - d) Explain the construction and working of jig boring machine with the help of a block digram.
  - e) A square hole of 100mm × 100mm is to be machined on stainless steel plate of 100mm thickness and 500mm diameter. Select the suitable machine for this operation and describe the process.

**5. Attempt any TWO of the following:****12**

- a) Find the time required for one complete cut on a workpiece of 60mm diameter and 400mm long. The cutting speed is 50m/min and the feed is 0.5mm/rev.
- b) Distinguish between upmilling and downmilling with neat sketch.
- c) Suggest suitable grinding wheels for grinding!
  - i) Stainless steel, Alloy steels etc.
  - ii) Copper, Brass etc.
  - iii) Cast irons.

**6. Attempt any TWO of the following:****12**

- a) Explain the various elements of a single point cutting tool with the help of sketches.
  - b) Classify types of milling machines. Explain any one with neat sketch.
  - c) Suggest suitable grinding process for grinding precision needle roller. Explain the same process also.
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