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USN ☐☐☐☐☐☐☐☐☐☐   **06ME45**

Fourth Semester B.E. Degree Examination, December 2011
Manufacturing Processes – II

Time: 3 hrs.   Max. Marks:100

Note: *Answer any FIVE full questions, selecting*
at least TWO questions from each part.

PART – A

1   a. With neat sketches, explain the difference between orthogonal cutting and oblique cutting.
         (06 Marks)

   b. With a neat sketch, briefly explain the following, for a single point cutting tool :
        i) Back rake angle ;   ii) End clearance angle ;   iii) Side rake angle ;   iv) Side relief angle.
         (08 Marks)

   c. The following are the details during turning of a mild steel work piece :
        feed = 0.19mm/rev , chip thickness = 0.385mm , depth of cut = 2mm.
        Calculate : i) Chip thickness ratio ; ii) shear angle.   **(06 Marks)**

2   a. Briefly explain the desirable properties of a cutting tool material.   **(05 Marks)**

   b. Write short notes on the following cutting tool materials :
        i) Cemented tungsten carbide ; ii) HSS.   **(05 Marks)**

   c. List any five factors for selecting a cutting fluid.   **(05 Marks)**

   d. Write short notes on the heat generated during metal cutting.   **(05 Marks)**

3   a. Explain with a neat sketch, the main parts of a turret lathe.   **(08 Marks)**

   b. Explain with a neat sketch, hydraulic shaper quick return mechanism.   **(08 Marks)**

   c. A shaping machine is used to machine a rectangular piece 18cm long and 35cm width, with cutting speed being 26 m/min. Feed is 0.8 mm/cycle. Cutting stroke is adjusted to 20cm. Time for cutting to return stroke is 3:2. Find the time required for machining the whole surface.   **(04 Marks)**

4   a. With simple sketches, explain : i) Reaming ; ii) Boring.   **(04 Marks)**

   b. With a neat sketch, explain the radial drilling machine.   **(06 Marks)**

   c. Explain with a neat sketch, the geometry of a twist drill.   **(04 Marks)**

   d. A 12mm hole is to be drilled through a 20mm thick plate. The cutting speed is 12mm/min and the feed rate is 0.12 mm/rev. Estimate the machining time. Take the over travel plus the clearance of the tool as 5mm.   **(06 Marks)**

PART – B

5   a. Differentiate between upmilling and down milling. Show the chip cross section with figures for both the operations.   **(06 Marks)**

   b. Sketch and explain the slabmilling and gang milling operations.   **(08 Marks)**

   c. Classify milling machines, briefly.   **(06 Marks)**

6   a. Explain the different types of abrasives.   **(06 Marks)**

   b. Differentiate between traverse and plunge grinding.   **(06 Marks)**

   c. Explain with neat sketches : i) Centreless grinding ; ii) Internal grinding.   **(08 Marks)**

7   a. Sketch and explain the process of lapping on a lapping machine.   **(10 Marks)**

   b. What is honing? Explain the vertical honing process.   **(07 Marks)**

   c. List the advantages and applications of honing.   **(03 Marks)**

8   a. With a neat sketch, briefly explain the operation of cutting, using a laser beam.   **(10 Marks)**

   b. With a neat sketch, briefly explain the principle involved in water jet machining.   **(10 Marks)**

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