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P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belgaum)

Fourth Semester, B.E. - Automobile Engineering

Semester End Examination; June/July - 2015

Manufacturing Technology - II

Time: 3 hrs

Max. Marks: 100

Note: Answer **FIVE** full questions, selecting **ONE** full question from each **Unit**.

UNIT - I

1. a. Differentiate between orthogonal cutting and oblique cutting. 6
- b. Draw a neat sketch of a single point cutting tool and indicating the various tool parts and angles. 6
- c. Explain the different types of chips formed during metal cutting. 8
2. a. Draw Merchant's force diagram. 8
- b. Discuss the characteristics of the following tool materials : 12
 - (i) Cemented Carbides
 - (ii) Ceramics

UNIT - II

3. a. Explain the mechanism of flank wear and crater wear. 6
- b. Discuss the affect of cutting speed and tool geometry on tool life. 6
- c. Discuss the factors affecting machinability of materials. 8
4. a. A cutting tool under roughing conditions in machining a mild steel part had a life of 1 hour at 24 m/min. Estimate the tool life on the same material for light finishing cuts at the same speed. 6
Take $n = \frac{1}{8}$ for roughing and $\frac{1}{10}$ for finishing.
- b. Explain different types of cutting fluids used in machining. 8
- c. Discuss the factors to be considered while selecting the cutting fluid. 6

UNIT - III

5. a. How a lathe is specified? Discuss. 6
- b. A brass pin is of 500 mm length and 40 mm diameter. Find the turning time to reduce the pin to 38.8 mm in one pass, when cutting speed is 60 m/min and feed is 0.8 mm/min. 6
- c. Differentiate between a capstan and Turret lathe. 8
6. a. Describe crank and slotted link mechanism used in shapers with a sketch. 8
- b. Enlist the differences between a planer and a shaper. 6
- c. A shaper makes 36 complete strokes per minute and the stroke length is 30 cm. The shaper has a cutting stroke to return stroke ratio of 3:2. Determine the cutting speed in m/min. 6

UNIT - IV

- 7 a. Sketch and explain the working principle of a radial drilling machine. 8
- b. Explain the following machining operations that are performed on a drilling machine; 6
- (i) Reaming (ii) Counter sinking (iii) Tapping
- c. A 12 mm hole is to be drilled through a 20 mm thick plate. The cutting speed is 12 m/min and the feed rate is 0.12 mm/rev. Estimate the machining time. Take the over travel plus the clearances of the tool as 5 mm. 6
- 8 a. Describe the constructional features of a plain cylindrical grinding machine with a sketch. 8
- b. Explain: 6
- (i) Natural abrasives (ii) Vitriified bonding process
- c. Discuss the factors to be considered while selecting a grinding wheel for different applications. 6

UNIT - V

- 9 a. Describe the principle of operation of a horizontal milling machine with the help of sketch. 8
- b. Explain the following milling operations : 6
- (i) Face milling (ii) Straddle milling (iii) Form milling.
- c. Write a note on direct indexing method. 6
- 10 a. With a sketch describe the working principle of Laser beam machining. 10
- b. Explain the following surface finishing processes : 10
- (i) Lapping (ii) Honing

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