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10ME/AU45

**Fourth Semester B.E. Degree Examination, Dec.2017/Jan.2018**  
**Manufacturing Process - II**

Time: 3 hrs.

Max. Marks:100

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

**PART - A**

- 1 a. What is Rake angle? Explain the significance of positive and negative rake angles with suitable sketches. (04 Marks)
- b. Derive an expression for the shear angle in orthogonal cutting in terms of rake angle and chip thickness ratio. (08 Marks)
- c. A Lathe turning at a particular speed is cutting MS work piece with HSS tool. The speed – life relationship for the tool is given by  $VT^{0.4} = 400$ . Determine the percentage increase in the tool life, if the cutting speed is reduced by 20%. (08 Marks)
- 2 a. Briefly explain the salient points of following cutting tool materials i) HSS ii) CBN. (06 Marks)
- b. What is Coolant? Explain why coolant is used in metal cutting. (06 Marks)
- c. With neat sketch, explain different zones of heat generation in metal cutting. (08 Marks)
- 3 a. With suitable sketch, explain the typical layout for producing hexagonal bolt and nut on Capstan Lathe. (08 Marks)
- b. A cast iron plate of dimensions 600mm × 300mm × 60mm is to be rough shaped along its wider face. Calculate the machining time, if cutting speed is 9m/min. The return time to cutting time ratio is 1:4 and the feed is 3mm. The clearance at each end is 75mm. (06 Marks)
- c. What are the differences between Planet and Shaper? (06 Marks)
- 4 a. With neat sketch, explain the spindle drive mechanism in bench drilling machine. (04 Marks)
- b. With sketches, explain the following drilling operations : i) Reaming operation ii) Boring operation iii) Tapping operation and v) Trapping operation. (12 Marks)
- c. What are the advantages and disadvantages of CNC machine? (04 Marks)

**PART - B**

- 5 a. Explain briefly how milling machines are classified. (06 Marks)
- b. With suitable sketch, label all the important parts of plain milling cutter. (06 Marks)
- c. List out the differences between conventional milling and climb milling with suitable sketches. (08 Marks)
- 6 a. Briefly explain different abrasive materials used for making grinding wheel. (06 Marks)
- b. List and explain the factors considered in the selection of grinding wheel. (08 Marks)
- c. What is the function of bonds in grinding wheel? Briefly explain different bonding processes used. (06 Marks)
- 7 a. What is Broaching? Explain different types of broaching based in method of operation. (05 Marks)
- b. List the advantages and limitations of broaching. (05 Marks)
- c. Explain the following surface finishing processes : i) Honing ii) Buffing. (10 Marks)
- 8 a. With suitable sketch, explain Abrasive jet machining. What are the advantages and disadvantages of abrasive jet machining? (10 Marks)
- b. List and explain the parameters which affect the cutting rate in the Ultrasonic machining. (06 Marks)
- c. What are the Applications of EDM? (04 Marks)

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