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10ME/AU45

# Fourth Semester B.E. Degree Examination, June/July 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. With neat sketches, briefly explain orthogonal and oblique cutting operations. **(08 Marks)**

b. Explain the significance of Merchant's circle. Diagram deriving Horizontal Cutting Force ($F_c$) , Thrust Force ($F_t$) , Shear Force ($F_s$) and Force normal to Shear Force ($F_{nS}$) developed during cutting operation. **(08 Marks)**

c. The tool life for HSS tool is expressed by the relation $VT^{1/7} = C_1$ and for tungsten carbide tool is $VT^{1/5} = C_2$. If the tool life for a cutting speed of 24m/min is 128 minutes. Compare the life of the two tools at a speed of 30m/min. **(04 Marks)**

2 a. Briefly explain the following cutting tool materials :
i) HSS ii) Carbides iii) Ceramics iv) Boron Nitride. **(08 Marks)**

b. Explain the functions and properties of cutting fluids. **(08 Marks)**

c. Sketch and explain the zones of heat generation in metal cutting. **(04 Marks)**

3 a. Sketch and explain the operations and tool layout for producing hexagonal bolt using capstan lathe. **(08 Marks)**

b. Sketch and explain the open and cross belt drive mechanism of a planer. **(08 Marks)**

c. A shaper makes 36 strokes per minute and the stroke length is 30cm. The shaper has a cutting stroke to return stroke ratio of 3:2. Determine the cutting speed in m/min without taking the clearance into account. **(04 Marks)**

4 a. Sketch and explain the following operations performed using Drilling machine :
i) Reaming ii) Boring iii) Tapping **(08 Marks)**

b. Briefly explain the co-ordinate systems employed in CNC machines. **(08 Marks)**

c. Sketch and indicate the Nomenclature of a Twist Drill. **(04 Marks)**

### PART – B

5 a. Sketch and explain Horizontal Spindle column and Knee type milling machine. **(08 Marks)**

b. Sketch and explain the following milling operations :
i) Slot milling ii) Gang milling iii) Keyway milling. **(08 Marks)**

c. Briefly explain Compound Indexing. **(04 Marks)**

6 a. Briefly discuss the Grit, Grade and Structure of a Grinding wheel. **(08 Marks)**

b. Sketch and explain the principle of Centerless Grinding Machine. **(06 Marks)**

c. Briefly discuss Dressing and Truing of Grinding wheels. **(06 Marks)**

7 a. Sketch and explain Horizontal Continuous surface broaching machine. **(08 Marks)**

b. Sketch and explain the principle of Lapping process. **(08 Marks)**

c. Mention the advantages and limitations of Honing process. **(04 Marks)**

8 a. How do you classify Non – Traditional machining (NTM) processes? **(04 Marks)**

b. Sketch and explain Abrasive Jet Machining (AJM). **(08 Marks)**

c. Sketch and explain Electron Beam Machining (EBM). **(08 Marks)**

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