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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 : (08 Marks)
 i) HSS ii) Carbides iii) Ceramics iv) Boron Nitride. (08 Marks)
 b. Explain the functions and properties of cutting fluids. (04 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 : (08 Marks)
 i) Reaming ii) Boring iii) Tapping (08 Marks)
 b. Briefly explain the co-ordinate systems employed in CNC machines. (04 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 : (08 Marks)
 i) Slot milling ii) Gang milling iii) Keyway milling. (04 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)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
 Any violation of identification, approval, evaluation and for equations written up to 4:18 = 50 will be treated as malpractice