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18ME35A/MEA305

## Third Semester B.E. Degree Examination, July/August 2021 Metal Cutting and Forming

Time: 3 hrs.

Max. Marks: 100

**Note: Answer any FIVE full questions.**

- 1
  - a. Sketch and explain Tool signature of Single point cutting tool. (07 Marks)
  - b. Determine the Shear Plane angle of Single Point cutting tool. (10 Marks)
  - c. What are the types of chips? (03 Marks)
  
- 2
  - a. Sketch and explain the parts of an Engine Lathe. (10 Marks)
  - b. What are the Lathe Operations? (05 Marks)
  - c. Differentiate between Engine Lathe and Capstan and Turret Lathe. (05 Marks)
  
- 3
  - a. Sketch and brief about the various Milling Operations. (10 Marks)
  - b. What are the methods of Indexing? (05 Marks)
  - c. Note the differences between drilling , boring and reaming operations. (05 Marks)
  
- 4
  - a. What are the differences between Shaper, Planar and Slotter? (08 Marks)
  - b. Sketch and explain Surface Grinding machine. (12 Marks)
  
- 5
  - a. What are the effect of Process Parameters on tool life? Explain. (10 Marks)
  - b. What are the functions of cutting fluids? (05 Marks)
  - c. What are the effect of Machining Parameters on Surface finish. (05 Marks)
  
- 6
  - a. What is Machinability and Machinability Index? Explain. (08 Marks)
  - b. The following equation for tool life is given for a turning operation ( $V T^{(0.13)} f^{(0.77)} d^{(0.37)} = C$ ). A 60min tool life was obtained while cutting at  $V = 30\text{m/min}$  ,  $f = 0.3\text{mm/rev}$  and depth of cut  $d = 25\text{mm}$ . Calculate the change in tool life, if the cutting speed , feed , depth of cut are increased by 25%, Individually and also taken together. What will be their effect on tool life? (12 Marks)
  
- 7
  - a. Sketch and explain different forging equipments. (12 Marks)
  - b. Write a note on different forging defects. (08 Marks)
  
- 8
  - a. Sketch and explain the types of Rolling Mills. (12 Marks)
  - b. What are the variables in drawing process? (08 Marks)
  
- 9
  - a. Sketch and explain Sheet Metal Cutting Operation. (12 Marks)
  - b. Brief out the different variables in drawing process. (08 Marks)
  
- 10
  - a. Explain : i) Drawing Ratio      ii) Thickness Ratio      iii) Drawing Force  
iv) Blank holding force      v) Ironing. (10 Marks)
  - b. Explain with neat sketches, Progressive and Combination dies. (10 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.