CBCS SCHEME

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18ME35A/18MEA305

Third Semester B.E. Degree Examination, Aug./Sept.2020
Metal Cutting and Forming

Time: 3 hrs. Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1 a. Explain the different between orthogonal cutting and oblique cutting **(06 Marks)**
b. Briefly explain the mechanism and types of chip formation. **(08 Marks)**
c. Briefly explain the elements of a single point with a neat sketch. **(06 Marks)**

OR

2 a. Derive an expression for shear plane angle with respect to orthogonal cutting. **(08 Marks)**
b. List and explain the various operations carried out on lathe machine. **(12 Marks)**

Module-2

3 a. Define Milling. Explain with a neat sketch the vertical milling machine. **(10 Marks)**
b. Define Drilling. With a neat sketch explain a radial drilling machine. **(10 Marks)**

OR

4 a. Sketch and explain the fundamental parts of a horizontal shaping machine. **(10 Marks)**
b. With a neat sketch explain the centerless grinding machine. **(10 Marks)**

Module-3

5 a. Define tool wear. Explain crater wear and flank wear. **(08 Marks)**
b. Define tool life and explain the factors which affect the tool life. **(08 Marks)**
c. Briefly explain the different types of cutting fluids. **(04 Marks)**

OR

6 Write the short notes on the following :
a. Choice of feed
b. Tool life for minimum cost
c. Minimum production time
d. Choice of Cutting Speed. **(20 Marks)**

Module-4

7 a. How sheet metal operations are classified? Explain with a neat sketch. **(14 Marks)**
b. A 90° bend is to be made from steel sheet by air bending process. The bend length is 30cm, thickness of sheet 3mm and width 4cm. The ultimate tensile strength of the sheet material is 400 N/mm^2. Calculate the bending force. Suppose if the bend is to be made by edge bending process, with die and punch radius = 10mm. Find the bending force required. (Assume die opening factor k = 1.33 for Air bending and 0.67 for edge bending). **(06 Marks)**

OR

8 a. How are dies classified? Explain with figures working of progressive and compound die arrangements in sheet metal working. **(12 Marks)**
b. List and explain variables that affect during deep drawing. **(08 Marks)**

Module-5

9 a. With a neat sketch explain the classification of metal working process on the basis of force applied. **(10 Marks)**

b. With a neat sketch, explain different types of rolling mill arrangements. **(10 Marks)**

OR

10 a. Differentiate between direct and indirect extrusion process. **(06 Marks)**

b. Explain the different types of rolling defects. **(05 Marks)**

c. Mention the advantages, disadvantages and applications of forging. **(09 Marks)**

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