USN ☐☐☐☐☐☐☐☐☐☐ **15ME35B**

Third Semester B.E. Degree Examination, Dec.2016/Jan.2017
Machine Tools and Operations

Time: 3 hrs.   Max. Marks: 80

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

Module-1

1 a. Explain the classification of machine tools with suitable example.   (08 Marks)
   b. Illustrate the concept of Lathe with a neat sketch.   (08 Marks)

OR

2 a. Explain the constructional features of plaining machine with a neat sketch. (08 Marks)
   b. Define drilling. With a neat sketch explain Radial drilling machine.   (08 Marks)

Module-2

3 a. Define machining of a tool. Explain with a neat sketch of following operations.
      i)   Turning
      ii) Boaring
      iii) Shopping.   (08 Marks)
   b. Discuss the related machining parameters of related quantities.   (08 Marks)

OR

4 a. With a neat sketch explain the concept of Gear cutting.   (08 Marks)
   b. Explain with a neat sketch of following operations :
      i)   Broaching
      ii) Reaming
      iii) Grinding
      iv) Countersinking.   (08 Marks)

Module-3

5 a. Illustrate the desirable properties and characteristics of cutting tool material. (08 Marks)
   b. Give the concept of tool Geometry and related importance of different angles of the cutting tools.   (08 Marks)

OR

6 a. What is the necessity of 'coolant'? Explain some of the cutting fluids with their applications.
                                                                                  (08 Marks)
   b. Discuss the machining parameters on surface finish.   (08 Marks)

Module-4

7 a. With the neat sketch give the description regarding chip formation.   (06 Marks)
   b. Explain two different type of chip formation.   (06 Marks)
   c. Explain the concept of oblique and orthogonal cutting?   (04 Marks)

OR

8   a.   Draw the circle with radius, which gives the merchant circle and derive Ernst –Merchant equation.   **(08 Marks)**
     b.   Draw the share angle relationship and derive the equation

$$\tan\phi = \frac{r\cos\alpha}{1 - r\sin\alpha}$$ **(08 Marks)**

Module-5
9   a.   Why the cutting tool will loose its ability? Discuss it with suitable reasons.   **(05 Marks)**
     b.   Define tool wear. Explain craters wear and flank wear.   **(07 Marks)**
     c.   List the factors affecting tool life.   **(04 Marks)**

OR

10   Write short notes on the following :
     a.   Choice of feed
     b.   Tool tip for minimum cost
     c.   Minimum production time
     d.   Choice of cutting speed.   **(16 Marks)**

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