B. E. Part-I (1st Semester) Examination, Nov-Dec 2012

Manufacturing Method (MEMT 1201)

Full marks: 50 Time: 2h

## Part-A

1. a) Define cutting speed and depth of cut in metal cutting operation.
   b) Name three cutting tool materials.
   c) A $\phi$ 30 X 200 mm long ms job is to be turned to $\phi$ 20 with an hss turning tool. The cutting speed is 30 m/min and the feed is 0.4 mm/min. The over travel and approach are 5 mm and 10 mm respectively. Determine the machining time.

   4 + 1.5 + 3

   OR

   a) Why are nontraditional machining processes used?
   b) How is taper designated?
   c) Sketch the following operation showing the motions:
      i) Facing in a lathe
      ii) Milling a flat surface by slab milling cutter
      iii) Drilling a hole in drilling machine. 3 + 2.5 + 3

2. a) In a lathe the speeds are 40, 56, 78, 110, 155 and 220 rpm. For machining a 60 mm diameter ms bar with an hss turning tool, select the correct rpm. Assume cutting speed to be 30 m/min.
   b) What is a machine tool?
   c) Give a classification of machine tool.
   d) Write an example of bilateral tolerance. 3 + 2 + 3 + 1

   OR

   a) What is meant by the quality of a product?
   b) Explain the break even quantity in manufacturing process?
   c) For a turning tool show the principal cutting edge and auxiliary cutting edge.
   d) For cutting a thread of pitch 1.5 mm in a lathe, what will be the feed?
   e) What is mechanism? 3 + 2 + 1 + 1 + 2

## Part-B

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| 1. | (a) | Draw a flow chart for manufacturing integrated circuits | 5 |
| | (b) | How can we etch $SiO_2$ | 3 |
| | | OR | |
| 2. | (a) | What are the different steps in photolithography | 4 |
| | | Define positive and negative photoresists | 4 |
| 3. | (a) | Describe Von Mise's Criteria. | 4 |
| | (b) | Enumerate the deviatoric force and its second invariant | 5 |
| | | OR | |
| 4 | (a) | Name the different techniques for manufacturing powder particles and the corresponding morphology of the particles | 4 |
| | (b) | Enumerate the different steps involved in powder metallurgy technique with a flow diagram | 5 |