B. E. Part I (2nd Semester) Examination, April-May, 2013
Manufacturing Methodologies (MEMT 1201)

Full marks: 35 **Time: 2h**

Part-I

1. a) Define cutting speed, feed and depth of cut in metal cutting operation. Explain how the selection of cutting speed depends on tool life.
   b) An ms bar ϕ 36 X 150 mm is to be turned to ϕ 25 over the entire job length with an hss turning tool. The permissible cutting speed is 28 m/min. The feed is 0.5 mm/rev. Assume an over travel of 5 mm and approach of 5 mm. Assuming suitable number of passes, determine the machining time.
   c) A grinding wheel is specified as
   A – 60 – G – 8 – V.
   Explain all the terms of it. 4 + 3 + 3

OR

   a) Sketch the following operations with necessary motions:
      i) facing operation in a lathe
      ii) upcut milling operation
      iii) shaping a flat surface
      iv) grooving operation in a lathe
   b) Why is non conventional machining operation used? Explain.
   c) What is meant by quality in manufacturing? Explain. 4 + 3 + 3

2. a) For drilling a 10 mm hole on a job, what is the depth of cut?
   b) What is volume removal rate in metal cutting operations? Write its expression in terms of the chief elements of metal cutting.
   c) Explain the break even quantity.
   d) For machining a thin work piece, down cut milling is preferred. Explain.

1 + 2.5 + 2 + 2

OR

   a) Define a machine tool.
   b) Give a classification of machine tool with suitable examples.
   c) What is a CNC machine tool?
   d) Name three non-conventional machining processes. 2 + 2 + 2 + 1.5

Part-II

1. (a) Explain the method for identification of riser location in casting. 3
   (b) Show the riser locations for casting of the letter 'W' having uniform cross section for each arm. 3

OR

2. (a) What is the importance of Von Mise's criteria in metal forming process? 3
   (b) Classify the metal forming processes in terms of the nature of applied force. 3

3. Obtain the deformation stress in the case of deformation of a piece of metal through a wedge shaped die. Assume the necessary geometrical parameters. 6.5

OR

4. (a) Describe the popular powder manufacturing techniques and the corresponding morphology of powder. 3
   (b) Describe the purpose and process of hot iso-static pressing. 3.5

5. Write notes on (any two) 2.5×2
   (i) Deviatoric stress
   (ii) Sintering technique
   (iii) Use of chill in casting