

**BACHELOR OF TECHNOLOGY IN
MECHANICAL ENGINEERING
(COMPUTER INTEGRATED
MANUFACTURING)**

Term-End Examination

June, 2011

BME-003 : MANUFACTURING TECHNOLOGY

Time : 3 hours

Maximum Marks : 70

Note : All questions are compulsory. Use of calculator is allowed.

1. Answer *any eight* questions : **8x5=40**
- (a) Why distortion occurs in welding? Describe at least four types of distortions in welding.
 - (b) What are the process variables in GTAW? Discuss the effect of process variables on the quality of weld.
 - (c) What are the various criterion for classifying the welding processes? What is the difference between melting and fusion?
 - (d) What are the variables that affect the cutting force? Discuss the effects of these variables on the cutting force.
 - (e) What is sheet metal forming? How sheet metal forming processes can be classified?

- (f) Describe following forging operations with the help of neat sketches :
- (i) Fullering
 - (ii) Swaging
- (g) What do you understand by Bulk deformation processes ? Describe the different categories of Bulk deformation processes.
- (h) Explain hot working and cold working. Write the advantages and disadvantages of hot working and cold working.
- (i) What is the Bauschinger effect ? Explain with the help of stress - strain diagram.
- (j) Distinguish between pore water and free water. Explain their effects on the green strength of the sand.

2. Answer *any two* questions :

10x2=20

- (a) Calculate the time required to mill a slot of 350 mm × 30 mm in a work piece of 350 mm length with a side and face milling cutter of 120 mm diameter, 30 mm wide and having 20 teeth. The depth of cut is 6 mm, the feed per tool is 0.1 mm and cutting speed is 34 m/min. Assume overtravel distance of 5 mm.

- (b) During orthogonal machining with a cutting tool having a 12° rake angle, the chip thickness is measured to be 0.44 mm, the uncut chip thickness being 0.18 mm.

Determine :

- (i) Shear plane angle,
(ii) Shear strain
- (c) Determine the force required for blanking a circular disc of 30 mm diameter from C20 steel sheet whose thickness is 1.5 mm. Also determine the die and punch sizes for blanking the circular disc. Shear strength of annealed C - 20 steel is 294 N/mm^2 .

3. Write short notes on *any two* of the following. 10

- (a) Cutting fluids used during metal cutting
(b) Permanent Mould Casting
(c) Economics of Machining
(d) Elasticity Constants.
-