

00181

**BACHELOR OF TECHNOLOGY IN
MECHANICAL ENGINEERING
(COMPUTER INTEGRATED
MANUFACTURING)
BTCLEVI/BTMEVI/BTELVI/BTCSVI/BTECVI**

Term-End Examination

December, 2013

BME-003 : MANUFACTURING TECHNOLOGY

Time : 3 Hours

Maximum Marks : 70

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

1. Answer *any eight* questions : **8x5=40**
- (a) Name the various additives used in moulding sand and explain how they affect its properties.
 - (b) List the various advantages, limitations and applications of investment casting.
 - (c) Define metal forming. Discuss the difference between hot working and cold working of metals.
 - (d) What is meant by formability of a sheet metal ? What factors do affect formability ?
 - (e) What is wire drawing? What types of products are made by this methods ?
 - (f) Sketch a single point cutting tool showing its different angles and planes.
 - (g) What are the variables that affect the cutting force ? Discuss the effects of these variables on the cutting force.

- (h) What are the various criteria for classification of the welding processes ? What is the difference between melting and fusion ?
- (i) List and explain the process parameters in gas metal arc welding.
- (j) Define the following terms in welding process.
 - (i) Spatter
 - (ii) Step-back sequence
 - (iii) Undercut
 - (iv) Track weld
 - (v) Crack

2. Answer *any two* questions : **10x2=20**

- (a) During orthogonal turning operation, following data were observed;
 - Undeformed chip thickness, $t_u = 0.125\text{mm}$
 - deformed chip thickness, $t_c = 0.225\text{mm}$
 - Cutting velocity $V_c = 133\text{m/min}$,
 - Back rake angle, $\alpha = 10^\circ$
 - Width of cut, $b = 6.25\text{mm}$
 - Cutting force, $F_c = 42.0\text{kgf}$, and
 - Tangential force $F_t = 17.0\text{kgf}$.
 Calculate the percentage of total energy consumed in friction at the tool-chip interface.
- (b) A tensile specimen with 10mm initial diameter and 50mm gauge length reaches maximum load at 82kN and fractures at 66kN. The minimum diameter at fracture is 8mm. Determine the engineering stress at maximum load, true fracture stress, true strain at fracture and engineering strain at fracture.

- (c) Calculate the drawing load for 30% reduction of area of 20×5 mm annealed mild steel using straight tapered die. Assume $\mu=0.1$, yield stress of mild steel as 30 kg/mm^2 and angle $\alpha=26.5^\circ$, $\sigma_0^1=1.15\text{Mpa}$.

3. Write short notes on *any two* of the following : **5x2=10**
- (a) Economics of machining
 - (b) Forging defects
 - (c) Difference between open die forging and closed die forging.
 - (d) Materials for core making.
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