

**BACHELOR OF TECHNOLOGY IN
MECHANICAL ENGINEERING
(COMPUTER INTEGRATED
MANUFACTURING)
BTCLEVI/BTMEVI/BTELVI/BTCSVI/BTECVI
Term-End Examination
December, 2012**

BME-003 : MANUFACTURING TECHNOLOGY

Time : 3 Hours

Maximum Marks : 70

*Note : Answer any five questions. Use of calculator is allowed.
Assume suitable data if any missing.*

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| 1. | (a) | What are the factors which govern the selection of a suitable type of furnace for melting a particular metal ? | 3 |
| | (b) | What is meant by green strength and dry strength as applied to a moulding sand? | 4 |
| | (c) | Sketch a blast furnace. Describe its construction and working. | 7 |
| 2. | (a) | What is a core ? What are the characteristics of a good core ? | 3 |
| | (b) | What are the advantages and limitations of Investment casting ? | 4 |
| | (c) | Explain the difference with the help of sketches between true centrifugal casting, semi centrifugal casting and centrifuge casting. | 7 |

3. (a) What is Hooke's Law ? What is Poisson's ratio ? 3
- (b) What are the different types of Power Hammers ? Explain any one. 4
- (c) A steel washer of 28mm outer diameter and 20mm inside diameter is to be made from 1.3mm thick sheet. If the shear stress of the material is 380 N/mm², Calculate the following : 7
- (i) Force required to produce the washer if both punches operate at the same time with no shear.
- (ii) Force required if only one punch operates at a time (that is the punches are staggered).
4. (a) Which coolants would you suggest for turning of following metals with HSS tools ? 3
- (i) Mild steel
- (ii) Aluminium
- (iii) Copper
- (b) What are the advantages of indexable inserts ? How can indexable inserts and their holders be specified ? 4
- (c) During orthogonal turning operation the following data was obtained. 7
- Cutting Force=120kg
- Feed force=30kg
- Rake angle=10°

Feed=0.2mm/rev

Width of cut=2.3mm

Chip thickness=0.4mm

Cutting speed=120m/min

Determine the following :

(i) Chip thickness ratio

(ii) Shear angle

(iii) Shear stress

5. (a) Why is the rake angle of tool important ? 3
Which type of rake angle is suitable for machining of brittle materials ?
- (b) Discuss the effect of following factors on tool life :- 4
(i) Tool geometry
(ii) Coolant
(iii) Microstructure
- (c) Describe the process of submerged arc-welding with suitable diagram. Discuss its advantages and limitations. 7
6. (a) What are the criteria for classifying the welding process ? 3
- (b) Explain the plasma Arc welding process briefly. 4
- (c) Discuss the different methods to control distortion in base metal during welding. 7

7. (a) What is the difference between incomplete fusion and penetration ? 3
- (b) Compare A.C. Power source welding with D.C. Power source welding. 4
- (c) Discuss with help of a neat sketch the principle of "Tungsten Arc Welding" process. 7
8. Write short notes on **any four** : $4 \times 3\frac{1}{2} = 14$
- (a) Shell moulding process
- (b) Impression-die forging
- (c) Economics of Machining
- (d) Clearance between punch and die for drawing operation
- (e) Carbon Arc cutting
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