

**B.Tech. MECHANICAL ENGINEERING  
(COMPUTER INTEGRATED  
MANUFACTURING) /  
(BTMEVI)**

**Term-End Examination**

**December, 2015**

**BME-008 : MACHINING TECHNOLOGY**

*Time : 3 hours*

*Maximum Marks : 70*

*Note : Attempt any five questions. All questions carry equal marks. Use of scientific calculator is permitted.*

1. (a) What is Orthogonal cutting ? Derive

$$\tan \phi = \left( \frac{r_c \cos \alpha}{1 - r_c \sin \alpha} \right),$$

where

$r_c$  = Chip thickness ratio,

$\alpha$  = Rake angle,

$\phi$  = Shear plane angle.

3+7

- (b) Explain chip formation with Built-up-Edge, with the help of a neat sketch.

4

2. During orthogonal cutting operation, the following observations were recorded :

- (a) Rake angle of tool =  $10^\circ$
- (b) Tool chip contact length ( $l$ ) = 1.0 mm
- (c) Tool chip contact length ( $l_1$ ) = 0.75 mm
- (d)  $\sigma_{\max} = 2000 \text{ kg/cm}^2$ ,  $\tau_{\max} = 1000 \text{ kg/cm}^2$ .

Calculate the average value of the coefficient of friction and the resultant force for a 5 mm wide cut.

14

3. (a) Explain various bonding materials used for manufacturing of a grinding wheel.

7

(b) What do you understand by grades and structure of an abrasive grain of a grinding wheel?

7

4. (a) What do you mean by Surface Integrity ? What is the classification of surface integrity?

7

(b) Describe the Magnetic Abrasive Finishing (MAF) process. Write the type (material type) and size of the abrasive and magnetic particles used in MAF process.

7

5. (a) Describe the principle and working of ultrasonic machining with the help of a neat sketch.

7

- (b) Write in brief about the production of Laser Beam and the working principle of Laser Beam Machining. 7
6. (a) What are the advantages, limitations and applications of Electrochemical Machining? 7
- (b) Describe the working principle of Wire cut Electric Discharge Machining, with help of a neat sketch. 7
7. (a) What are the differences between the metal spraying and electroplating processes? Why are these processes used? 7
- (b) Classify the Advanced Machining processes citing their applications. 7
8. Write short notes on any *four* of the following :

$$4 \times 3 \frac{1}{2} = 14$$

- (a) Tool Life
- (b) Abrasive Material used in a Grinding Wheel
- (c) Honing
- (d) Superfinishing
- (e) Ion Beam Machining
- (f) H.S.S. Cutting Tools
- (g) Cemented Carbide Tools