00904

BACHELOR OF TECHNOLOGY IN MECHANICAL ENGINEERING (COMPUTER INTEGRATED MANUFACTURING)

Term-End Examination

June, 2011

BME-010 : TOOL ENGINEERING AND MANAGEMENT

Time : 3 hours *Maximum Marks : 70*

Note : *Answer **any seven** questions. Use of calculator is allowed. Marks for sub - divisions of questions are as indicated.*

1. (a) Make a drawing - 3 Orthographic views of a tool bit and label all the essential parts, faces and angles. Define tool signature. **6**

(b) Distinguish between **4**

(i) Positive rake and negative rake angle

(ii) Relief and Clearance Angles.

2. (a) What are the factors upon which the selection of a tool material depends ? Discuss. **6**

(b) Which is the hardest cutting tool material next to diamond ? Mention a few of its characteristics and applications. **4**

3 (a) In an orthogonal cutting test the following Parameters were noted : 6

Width of chip (width of cut) = 2.5 mm

underformed chip thickness = 0.25 mm

chip thickness = 1.0 mm

working normal rake = $-5°$ (degrees)

cutting force = 900 N

Thrust force = 600 N

Calculate :

(i) The shear angle

(ii) The mean shear strength of the work material.

(b) Sketch Merchant's Circle diagram and explain the different forces and angles involved in it. 4

4. Explain briefly the various locating devices used commonly in jigs and fixtures, along with their neat sketches and relative merits and demerits. 10

5. (a) What is a die ? Make a neat sketch of a die and discuss the various parts ? 5

(b) (i) Discuss the shearing force in blanking and punching. 5

(ii) Discuss the factors which affect the shearing force.

6. Discuss the graphical method of determining the profile of a FLAT Form Tool. Explain each step in systematic manner ? Discuss the applications of form tools. 10

7. (a) Discuss the different tools used in Hand Moulding. 5

(b) What are ladle and crucibles ? How do they differ from each other ? Explain. 5

8. (a) What is the purpose of laying out the workpiece ? Describe a centre punch and prick punch with the help of a sketch. 5

(b) What are various causes of accident in Manufacturing Industry ?
Discuss the various safety norms in the Industry. 5

9. (a) Explain the followings. 5

(i) Tool condition monitoring

(ii) Method of calculating tool number

(b) What are various functions of guideways under what conditions will you prefer the use of sliding friction guideways ? 5

10. (a) What are the commonly used input media in NC Programming ? Discuss. Write the benefits of NC machines. 5

(b) Explain in brief, the working of Web - based Virtual Machine Tool Operation (WVMT). 5