BME-010

B.Tech. MECHANICAL ENGINEERING
(COMPUTER INTEGRATED MANUFACTURING)

Term-End Examination

June, 2014

BME-010 : TOOL ENGINEERING AND MANAGEMENT

Time : 3 hours   *Maximum Marks : 70*

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

1. (a) Discuss the desirable properties of a cutting tool material. **7**

   (b) What are the advantages of indexable inserts ? How can indexable inserts and their holders be specified ? **7**

2. (a) In orthogonal turning of a 52 mm dia. mild steel bar on a lathe, the following data were obtained : Rake angle = 15°, cutting speed = 100 m/min, feed = 0·2 mm/rev, cutting force = 180 kg, feed force = 60 kg. Calculate the shear plane angle (ϕ), coefficient of friction (μ), cutting power, the chip flow velocity (v_f) and shear force, if the chip thickness = 0·3 mm. **10**

(b) Which angles determine the flow of chip across the face of the tool ? Explain with the help of diagram.   *4*

3. (a) Discuss the factors that have to be considered when cutting tools are to be designed. Explain with sketches the factors with specific reference to the design of single point cutting tools.   7

(b) What do you understand by clearance provided to jigs and fixtures ? Explain.   7

4. (a) Differentiate between :
   (i) Blanking and Piercing
   (ii) Stopping a strip stock and Registering a strip stock   7

(b) Explain the following :
   (i) Use of the technique of splitting a die down the vertical centre line.
   (ii) The operation of a progressive die.   7

5. (a) Give a systematic procedure for designing a flat form tool. Explain each step with an example.   7

(b) What are the various types of hand tools used in a foundry ? Draw sketches of any two of them.

6. (a) Discuss the different layout accessories with neat diagram. 7

(b) Compare the laying out of angles by Adjustable Square and Bevel Protractor. 7

7. (a) Explain the types of cross-sections used for machine tool beds and columns. 7

(b) What are the limitations of conventional CNC machine ? Explain in detail. 7

8. Write short notes on any *four* of the following :

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

(a) Special purpose machine tool

(b) Chip control

(c) Grinding fixture

(d) Compound die

(e) Tool management

(f) Economic Batch Size