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BME-010

B.Tech. MECHANICAL ENGINEERING (COMPUTER INTEGRATED MANUFACTURING)

Term-End Examination

December, 2015

BME-010 : TOOL ENGINEERING AND MANAGEMENT

Time : 3 hours *Maximum Marks : 70*

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

1. (a) A 0·2% carbon steel is machined with a triple carbide cutting tool having

0 – 10 – 6 – 6 – 8 – 75 – 1 mm

ORS shape, a feed of 0·15 mm/min have been employed. A chip thickness of 0·36 mm has been obtained. Calculate the chip thickness coefficient and shear angle. 7

(b) What are the main cutting tool materials ? Explain any five in brief, stating its principal characteristics and applications. 7

2. (a) Explain the aspect 'Degrees of freedom of movement of a free body' with reference to jigs and fixtures. 7

(b) Discuss in brief the working of turning fixture with a figure. 7

3. (a) Describe a systematic procedure for designing a flat form tool with the help of a suitable example. 10

(b) Explain various types of containers used in foundry in brief. 4

4. (a) Explain in brief the functions of a Stripper, Knock-out and Pilot in a Press tool. 7

(b) What precautions must be observed when designing small diameter piercing punches ? What is the purpose of a backing plate when used with piercing punches ? 7

5. (a) List the various layout accessories. Explain how angles can be laid using Ruler and Bevel protractor. 7

(b) What materials are commonly used for machine tool spindles ? What main characteristics should a machine tool spindle possess ? 7

6. (a) Discuss the different types of machine tool guideways with a figure. 7

(b) Explain the working of web-based virtual machine tool operation with a figure. 7

7. Write short notes on any ***four*** of the following : $4 \times 3\frac{1}{2} = 14$

(a) Merchant's Force Circle

(b) Tool Handling System

(c) Computer Numerical Control (CNC)

(d) Combination Die

(e) Principle of sheet metal working

(f) Classification of form tools