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BME-008

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BACHELOR OF TECHNOLOGY IN MECHANICAL ENGINEERING (COMPUTER INTEGRATED MANUFACTURING)

Term-End Examination

December, 2010

BME-008 : MACHINING TECHNOLOGY

Time : 3 hours *Maximum Marks : 70*

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

1. (a) Name different types of chips formed in metal machining. Which type of chip is suitable to enhance tool life ? Give the function of chip breaker. 1+2+2

   (b) Write the assumption made by merchant based on Thin zone model. 4

   (c) Show that in case of ideal orthogonal cutting operation the shear strain undergone by the chip during it's removal from the workpiece would be minimum if the chip thickness ratio is '1'. 5

2. (a) With the help of suitable sketch describe the sources of heat generation in metal cutting. 5

(b) List and briefly explain the factors affecting tool life. 6

(c) Name atleast nine desirable properties of good cutting tool material. 3

3. (a) Write an equation that can express the effect of cutting speed, feed and depth of cut on tool life. 3

(b) Name atleast four materials used as abrasive in grinding wheel. Briefly explain four commonly used bonding material to make grinding wheel. 1+4

(c) With the help of suitable sketch of diamond tool dresser describe dressing, truing and balancing. Why above operations are done in grinding wheel? 6

4. (a) With the help of suitable sketch, evaluate the maximum undeformed chip thickness 't' in surface grinding operations. 7

(b) Give a brief classification of grinding operations. With suitable sketch explain internal and external cylindrical grinding. 7

5. (a) Write a detailed note on wear and lubrication. 5+3

(b) With the help of suitable sketches explain the working of ultrasonic machining process. Also cite it's applications alongside justification of the same. 4+2

6. (a) With the help of schematic diagram describe the mechanics of metal removal in Honing operation. Also explain process capabilities and applications of honing. 5+3

(b) With the help of suitable schematic diagram explain the equipment set up of Electron Beam Machining (EBM). 6

7. (a) Give a brief classification of advanced machining processes on the basis of energy used in metal removing. 6

(b) Describe Abrasive Jet machining (AJM) with it's process capabilities and applications. 8

8. (a) With the help of neat sketch explain the mechanics of metal removal in EDM. 6

(b) Sketch the effects of following parameters on MRR during EDM using RC-circuit. 3

(i) Resistance

(ii) Capacitance

(iii) Current density

(c) During machining of Iron, the equilibrium gap is approximately 0.125 mm and measured value of specific conductance of electrolyte = $0.2\Omega^{-1}$ cm^{-1} Faradays constant is 26.8 At, applied voltage is 10V, calculate the value of feed rate. 5

Given :

Gram Atomic weight of Iron is 55.85, Valency is 2 and density is 7.85 g/cm^3.