Registration No. : | | | | | | | | | | |

Total number of printed pages – 2

B. Tech

PEME 5306

Sixth Semester Examination – 2013

MODERN MANUFACTURING PROCESSES

BRANCH : MECHANICAL

QUESTION CODE : A 210

Full Marks – 70

Time : 3 Hours

*Answer Question No. **1** which is compulsory and any **five** from the rest.*

The figures in the right-hand margin indicate marks.

1. Answer the following questions : 2×10

   (a) What do you mean by standoff distance in AJM ?

   (b) Define 'Ultrasonic'.

   (c) Write the principle of electro chemical machining.

   (d) What is the basic function of an etchant in chemical machining ?

   (e) Write the function of dielectric in EDM.

   (f) What are the equipments used in plasma arc spraying ?

   (g) Write some important applications of EBM.

   (h) How laser used to machine the material ?

   (i) Differentiate PVD and CVD.

   (j) What is the concept of concurrent engineering ?

2. (a) Describe with neat diagram the tool feed mechanism of an ultrasonic machine. 5

   (b) Discuss the effect of

      (i) Amplitude and frequency of vibration, and 5

      (ii) Grain diameter on material removal rate in USM.

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3. (a) Describe in detail the principle and mechanics of material removal in AJM. 5

(b) Write in detail about the different equipment used in water jet machining. 5

4. In an ECM operation a pure copper block is being machined if a current of 5000amp is used, determine the volume rate of material removal from the copper block. The gram atomic weight of copper is 63.57, valency is 1, density is 8.96 g/cm^3 and F=96500 coulombs.
Derive the formula used for solving the problem. 10

5. (a) In an EDM with R-C circuit, the supply voltage is 100 V and the breakdown voltage corresponds to maximum power delivery conditions. If the supply voltage is increased to 125 V without altering any of the other electrical parameters of the circuit, what is the percentage increase in metal removal rate ? 5

(b) Discuss the factors influencing the choice of electrode material in EDM. 5

6. (a) Discuss in detail the different parameters influence the performance of plasma arc machining process. 5

(b) A laser beam with power intensity of 2×10^5 w/mm^2 is used to drill a 0.2 mm diameter through hole in a tungsten sheet of 0.4 mm thickness. If the efficiency of the operation is only 10% estimate the time required. The thermal properties of tungsten are :

Melting temp= 3400°C, thermal conductivity = 2.15W/cm-°C, volume specific heat = 2.71J/ cm^3-°C. 5

7. (a) Describe the coating and electroless forming process. 5

(b) Discuss in detail the need and application of coating in high performance cutting tools. 5

8. Write short notes on any **two** of the following : 5×2

(a) Reverse engineering.

(b) Electron beam machining.

(c) Chemical Blanking.

(d) Aching od semiconductor.
