Code: 9A03708 **R09**

B.Tech IV Year I Semester (R09) Regular & Supplementary Examinations December 2015

MODERN MANUFACTURING METHODS

(Mechanical Engineering)

Time: 3 hours Max. Marks: 70

Answer any FIVE questions
All questions carry equal marks

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1 (a) Enumerate with the help of example modern machining process and classify them.
(b) Clearly explain the points to be considered for selecting the particular non-traditional process.

2 (a) Discuss the effects of the following parameters on the rate of material removal and surface finish obtainable in ultrasonic machining.
(i) Amplitude and frequency of vibration.
(ii) Static load.
(b) Name the characteristics of good suspension media in ultrasonic machining. Which fluid satisfies most of these requirements?

3 (a) Discuss the effect of following parameters on accuracy and rate of metal removal in AJM:
(i) Grain size. (ii) Jet velocity.
(b) What is the principle of WJM? With the help of neat sketch explain the method of machining. Give practical applications of WJM.

4 (a) Describe the chemistry involved in the ECM process. What is self-adjusting feature in ECM?
(b) Calculate the machining rate when iron is electrochemically machined using copper electrode and sodium solution (specific resistance = 5.0 ohm cm), the power supply data of the ECM machine used are: Supply voltage 18 V D.C current 5000 amp. Tool work gap of 0.5 mm (constant). Assume for iron atomic weight 56, valence 2 and density 7.87×10^6 g/m^3.

5 (a) What is the principle of EDM? Discuss the effect of: (i) Charging resistance (ii) Gap setting and (iii) Capacitance on rate of metal removal.
(b) Discuss the factors influencing the choice of electrode material in EDM. Name the best electrode material for finish machining a small die made of carbide by EDM.

6 (a) Explain the production of laser beam and working principle of LBM. Mention its application.
(b) Explain four specific applications where you feel that EBM should be the preferable choice.

7 (a) What is the principle of plasma arc machining? With the help of neat sketch explain the elements of plasma arc cutting system.
(b) Explain various parameters that influence the performance of chemical machining.

8 (a) Explain the working principle of magnetic abrasive finishing with the help of neat sketch.
(b) Explain the working principle of SLS process with the help of neat sketch.

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