

Reg. No. :

--	--	--	--	--	--	--	--	--	--	--	--

T 3332

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2008.

Sixth Semester

(Regulation 2004)

Mechanical Engineering

ME 1001 – UNCONVENTIONAL MACHINING PROCESSES

(Common to Production Engineering)

(Common to B.E. (Part –Time) Fifth Semester Regulation 2005)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Enlist the requirement that demands the use of advanced machining process.
2. Why unconventional mechanical machining process is not so effective on soft metals like aluminium?
3. Mention the application of catcher in water jet machining.
4. What are the characteristics of a good suspension media of the USM process?
5. What do you mean by recast layer with reference to the EDM?
6. What are the functions of adaptive control used for EDM?
7. What is the self adjusting feature in ECM?
8. What do you understand by "etch factor"?

9. What is the function of water muffler in PAM?
10. Can you machine electrically non-conducting materials using EBM process.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Explain the factors that should be considered during the selection of an appropriate unconventional machining process for a given job. (8)
- (ii) Compare and contrast the various unconventional machining process on the basis of the type of energy employed, material removal rate, transfer media and economical aspects. (8)

Or

- (b) (i) Explain the principle and elements of EBM, also how the work table is protected from getting damaged by electron beam. (8)
- (ii) Discuss how the process variables influences MRR, HAZ and pattern generation. (8)
12. (a) (i) Explain the principle of AJM. Mention some of the specific applications. (6)
- (ii) Discuss in detail about the AJM process variables that influences the rate of material removal and accuracy in the machining. (10)

Or

- (b) (i) Discuss in detail about the methods of generating the ultrasonic, characteristics of the various types of tool holder and tool feed mechanisms in USM. (10)
- (ii) Briefly discuss about the mechanisms involved in material removal by USM. (6)
13. (a) (i) Explain the classification and characteristics of various spark erosion generators. (8)
- (ii) With help of a neat sketch, describe the mechanism of material removal in EDM. (8)

Or

- (b) (i) Explain the working principle, elements and characteristics of wire EDM. (10)
- (ii) Explain how the stratified wire works. Also discuss about the recent developments in wire EDM. (6)

14. (a) (i) Describe the chemistry involved in ECM process. (8)
(ii) Briefly discuss about the effect of high temperature and pressure of electrolyte on the ECM process. (4)
(iii) Discuss about the economics of ECM. (4)

Or

- (b) (i) Describe the working principle and elements of chemical machining. What are the factors on which the selection of a resist for use in chemical machining? (10)
(ii) What are the specific advantages of using chemical machining over electro chemical machining? Give some of the practical application of chemical machining process. (6)
15. (a) (i) What is non transferred and transferred mode of plasma arc? Explain the mechanism of material removal in PAM. (8)
(ii) Discuss the factors that influence the quality of the cut in PAM. (8)

Or

- (b) (i) What is laser? Explain how it is used to machine the materials. (6)
(ii) Discuss in detail about the thermal features and analysis of laser beam machining. (10)
-