

R 8477

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2006.

Seventh Semester

Mechanical Engineering

ME 054 – UNCONVENTIONAL MACHINING PROCESSES

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. List any four variables in Abrasive Jet Machining that influence the metal removal rate.
2. List the advantages of Electric discharge Machining.
3. State the difference between wire cut EDM and EDM.
4. What is the function of servo control system in EDM?
5. List the functions of electrolytes in electrochemical machining.
6. Mention the applications of electro chemical machining.
7. State the characteristics of a laser beam.
8. What are the parameters that govern the performance of plasma arc machining?
9. What is the need for transducer in USM?
10. List the applications of Water Jet Machining.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Explain the servo system used to control the feed rate in EDM process. (6)
- (ii) With a typical component explain the working of a wire EDM system. (10)

Or

- (b) (i) List out the three types of spark generators used in EDM. Describe them. (8)
- (ii) Explain process parameters of EDM process. State the applications of EDM. (8)
12. (a) With suitable sketches, explain the need for the insulation in an ECM process. List the advantages, disadvantages and applications of this process. (8 + 8)

Or

- (b) With a neat sketch, explain the principle of electrochemical Grinding. State the process capabilities and applications. (8 + 8)
13. (a) Explain the principle of operation of an electron beam machining with its advantages and applications. (10 + 6)

Or

- (b) Explain the thermal features of Laser beam machining. Discuss the performance of various types of Lasers. (8 + 8)
14. (a) (i) List the various types of tool holders and transducers used in ultrasonic machining and explain them briefly. (10)
- (ii) Give a note on the feed mechanism used in USM system. (6)

Or

- (b) (i) Discuss the effects of the following parameters on the material removal rate and surface finish in ultrasonic machining :
- (1) Amplitude and frequency
 - (2) Abrasive size
 - (3) Concentration of abrasives
 - (4) Material hardness. (12)
- (ii) Give any four applications of USM. (4)
15. (a) With a neat sketch explain the operation and effect of process parameters of Abrasive Jet Machining system. List the applications. (10 + 6)

Or

- (b) With a neat sketch explain the principle of working of Water Jet machining process. List the advantages and disadvantages of WJM process. (10 + 6)