

B.E. DEGREE EXAMINATIONS NOV / DEC 2010

Seventh Semester

MECHATRONICS ENGINEERING

U07MHE12: Unconventional Machining Process

Time: Three Hours

Maximum Marks: 100

Answer ALL Questions:-

PART A (10 x 1 = 10 Marks)

1. Mechanical advanced machining methods uses _____.
A. Thermal Energy B. Kinetic Energy C. Potential Energy D. Electrical Energy.
2. Biochemical Machining is a process to machine _____.
A. Ferrous Metals B. Non – Ferrous Metals C. Composites D. Plastics
3. The range of size of abrasive particles used in AJM
A. 0.001 – 0.05 mm B. 0.1 – 0.5 mm C. 1 – 5 mm D. 10 – 50 mm
4. Lowering the temperature of the workpiece during USM would result in
A. increased MRR B. decreased MRR C. no effect on MRR D. unpredictable
5. The current used during EDM is
A. AC B. DC C. Pulsed AC D. Pulsed DC
6. For maximum power delivery through the circuit during EDM, ratio of the breakdown voltage to supply voltage is
A. 0.72 B. 1.0 C. 0.75 D. 0.65
7. Desirable properties of electrolytes used in ECM are
A. high specific heat B. high thermal conductivity
C. high electrical Conductivity D. low specific heat
8. Electrochemically machined surfaces have
A. high residual stresses and improved fatigue strength
B. high residual stresses and reduced fatigue strength
C. insignificant residual stresses and reduced fatigue strength
D. insignificant residual stresses and improved fatigue strength
9. LBM system cannot effectively machine
A. refractory materials B. tungsten carbide C. copper D. M.S.
10. In dual gas plasma arc machining _____ is used as the plasma gas
A. oxygen B. nitrogen C. hydrogen D. CO₂

PART B (10 x 2 = 20 Marks)

11. Enlist the requirements that demand the use of un conventional machining process.
12. Name the important factors that should be considered during the selection of an unconventional machining process for a given job.
13. What are the variables that affect the cutting phenomenon in AJM process?
14. What are the applications of AJM?
15. What are the properties required for dielectric fluid in EDM?
16. List the applications of Electric Discharge Diamond Grinding.
17. What you meant by maskants in Chemical Machining?
18. What are the advantages of Chemical Machining?
19. What is the function of water muffler in PAM?
20. Give the two major classifications of Electron Beam Machining.

PART C (5 x 14 = 70 Marks)

21. (a) (i) Briefly explain the overview of the non traditional machining process (7)
(ii) Why this machining is essential for industries? (7)
(OR)
(b) How will you decide to recommend specific advanced machining processes for
(i) cutting a glass plate into two pieces (7)
(ii) making a hole in a mild steel workpiece. (7)
22. (a) Explain in details with a sketch about AJM and discusses its advantages and disadvantages
(OR)
(b) Compare the AJM, USM and WJM processes in terms of Process capabilities and limitations
23. (a) (i) With the help of a neat sketch explain about the mechanism of material removal in EDM process. (10)
(ii) List the recent developments in EDM process. (4)
(OR)
(b) Explain the working principle, elements and characteristics of wire EDM
24. (a) Explain the process of Electro Chemical Grinding (ECG) with a sketch and lists its applications and advantages.
(OR)
(b) Describe the process of Electro Chemical Machining with neat sketch and discuss about influences of process parameters in machining output
25. (a) Explain the process of LBM and PAM with neat sketches
(OR)
(b) Discuss about the process capabilities of EBM and the process parameters of EBM in improving machining quality.
