KUMARAGURU college of technology
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Register Number: ……..

B.E DEGREE EXAMINATIONS: MAY 2015

(Regulation 2009)

Sixth Semester

MECHANICAL ENGINEERING

MEC124: Unconventional Machining Processes

Time: Three Hours **Maximum Marks: 100**

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. Traditional machining methods are often ineffective in machining these parts.
   a) Carbide b) Tool steel
   c) Ceramics d) Mild Steel
2. USM is based on _____ energy method
   a) Mechanical b) Chemical
   c) Electrical d) Thermal
3. For machining glass and tungsten carbide in USM, following tool is preferred
   a) Ceramics b) Tool steel
   c) Copper d) Tungsten
4. In AJM a focused stream of abrasive grains are made to impinge on the work surface through a nozzle of ____ mm diameter.
   a) 0.1 to 0.2 mm b) 0.3 to 0.5 mm
   c) 1 to 2 mm d) 3 to 5 mm
5. The most common electrode material used in EDM is
   a) Carbide b) Tool steel
   c) Graphite d) Tungsten
6. For most EDM operations _____ is used with certain additives that prevent gas bubbles and de-odoring.
   a) Kerosene b) Silicon fluid
   c) Ethylene glycol d) Water emulsion

7. _____ alloys can be machines more closely in chemical machining.
   a) Steel
   b) Nickel
   c) Aluminum
   d) Titanium
8. ECM uses a direct current at a high density of 0.5 to 5 A/mm2 and a low voltage of_____.
   a) 5 to 10 V
   b) 10 to 30 V
   c) 40 to 50 V
   d) 80 to 100 V
9. In _____ process the work piece material is removed through several effects including reflection, absorption, and conduction of light that is followed by melting and evaporation.
   a) LBM
   b) USM
   c) EBM
   d) PAM
10. In EBM, the tungsten filament cathode is heated to about _____ °C in order to emit electrons.
   a) 1500 to 2000
   b) 2500 to 3000
   c) 3500 to 4000
   d) 4500 to 5000

PART B (10 x 2 = 20 Marks)

11. What is unconventional machining process?
12. List the unconventional machining process which uses mechanical energy.
13. What are the abrasives used in AJM process?
14. What is magnetostrictor?
15. What is the purpose of dielectric in EDM?
16. What the basic requirements of tool material for EDM?
17. What is the purpose of etchants in chemical machining?
18. State the function of electrolyte used in ECM process?
19. What is acronym of LASER?
20. State the working principle of EBM.

PART C (5 x 14 = 70 Marks)

21. a) Explain the needs for unconventional machining process.

(OR)

   b) Compare the mechanical and electrical energy processes in terms of physical parameters, shape capabilities, process capabilities and process economy.

22. a) Explain WJM process with neat diagram.

(OR)

b) Discuss the process applications, advantages and limitations of AJM.

23. a) Explain the EDM process with neat sketch. State its process parameters.

(OR)

b) Discuss the process wire cut EDM. Mention its applications.

24. a) Discuss the chemical machining process, etchants and maskants with neat sketches.

(OR)

b) Describe the ECM process and give its applications.

25. a) Explain the thermal features of Laser beam machining. Discuss the performance of various types of lasers.

(OR)

b) Explain the principle and operation of electron beam machining with its advantages and disadvantages.

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