

**B.E., DEGREE EXAMINATIONS: MAY/JUNE 2013**

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. The basic principle of mechanical energy based UCM process is
  - a) corrosion
  - b) Erosion
  - c) Kinetic energy
  - d) Potential energy
2. UCM process is having
  - a) Low initial investment cost
  - b) High initial investment cost
  - c) Medium initial investment cost
  - d) Zero investment cost
3. The carrier fluid used in AJM process is
  - a) Air
  - b) Water
  - c) Oil
  - d) coolant
4. The type of energy used in WJM process is
  - a) Mechanical energy
  - b) Chemical energy
  - c) Electrical energy
  - d) Solar energy
5. The commonly used dielectric fluid in EDM process is
  - a) Soap water
  - b) De-ionized water
  - c) Mineral water
  - d) Animal oil
6. The advantage of WEDM process is
  - a) High cost
  - b) No cutting forces
  - c) Slow cutting rate
  - d) Not applicable to very large work pieces
7. The ratio of undercut to depth of cut in CHM process is known as
  - a) Metal removal rate
  - b) Arc of contact
  - c) Etch factor
  - d) Masking
8. In ECM process, the tool has a \_\_\_\_\_ shape.
  - a) Direct
  - b) Indirect
  - c) Conical
  - d) Cylindrical

9. In LBM process the metal removal is by using
- |                    |                      |
|--------------------|----------------------|
| a) Light energy    | b) Solar energy      |
| c) Chemical energy | d) Mechanical energy |
10. The main advantage of PAM process is
- |             |                     |
|-------------|---------------------|
| a) Cost     | b) Smoke and noise  |
| c) High MRR | d) Burr is produced |

**PART B (10 x 2 = 20 Marks)**

11. Give the need for the unconventional machining process.
12. List the various types of UCM process based on thermal energy.
13. What are the four major subsystem of an Abrasive Jet Machining process?
14. Give the advantages of Water Jet Machining process.
15. List the commonly used dielectric fluid in EDM process.
16. Define flushing.
17. List the desirable properties of Electrolyte used in ECM process.
18. List out the applications of ECG process.
19. Give the limitations of PAM process.
20. Define the working principle of EBM process.

**PART C (5 x 14 = 70 Marks)**

21. a) (i) Give the complete classification of UCM process based on Mechanical, Electrical energy and list the application of each process. (10)
- (ii) What are the important characteristics of UCM Process? (4)
- (OR)**
- b) (i) Give the complete classification of UCM process based on chemical, Electro chemical energy and list the application of each process. (10)
- (ii) List the factors considered for selecting a specific UCM process. (4)
22. a) Describe the working principle of Abrasive Jet Machining (AJM) process with a neat sketch and also explain the major process parameter of AJM.
- (OR)**
- b) (i) Explain the working principle of a Ultrasonic Machining process by using a neat diagram (10)
- (ii) Give the limitations and applications of a Water Jet Machining (WJM) process. (4)

23. a) Explain the working principle of Electrical Discharge Machining (EDM) process  
With a neat sketch and discuss the process parameter of EDM.

**(OR)**

- b) (i) Draw the circuit diagram of wire cut EDM process. (8)
- (ii) List out the properties of dielectric fluid used in EDM process (6)

24. a) Describe the working principle of Electro Chemical Machining (ECM) process  
with a neat sketch and discuss the process parameter of ECM.

**(OR)**

- b) (i) Explain the working principle of Electro Chemical Grinding (ECG) process  
with a neat diagram. (10)
- (ii) Give the advantages and disadvantages of Electro Chemical Grinding (ECG)  
process. (4)

25. a) Explain the working principle of Electron Beam Machining (EBM) process with  
a neat sketch.

**(OR)**

- b) (i) Give the advantages of Laser Beam Machine process. (7)
- (ii) Give the application of Plasma Arc Machining (PAM) process. (7)

\*\*\*\*\*