

B.E DEGREE EXAMINATIONS: APRIL/MAY 2014

(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. The basic principle of mechanical energy based UCM process is
 - a) corrosion
 - b) Erosion
 - c) Kinetic energy
 - d) Potential energy
2. Electro polishing process will be classified under the category of
 - a) Mechanical Energy
 - b) Electrical Energy
 - c) Chemical Energy
 - d) Thermal Energy
3. The Ultrasonic Machining (USM) process is based on
 - a) corrosion
 - b) Erosion
 - c) Kinetic energy
 - d) Potential energy
4. Water Jet Machining (WJM) cannot be used to machine
 - a) Frozen food
 - b) Plywood
 - c) Leather
 - d) Steel plates
5. The commonly used dielectric fluid in Electrical Discharge Machining (EDM) process is
 - a) Soap water
 - b) De-ionized water
 - c) Mineral water
 - d) Animal oil
6. The term related to Wire cut EDM process is
 - a) Maskants
 - b) Kerf
 - c) Beam
 - d) Nozzle
7. The ratio of undercut to depth of cut in Chemical Machining (CHM) process is known as
 - a) Metal removal rate
 - b) Arc of contact
 - c) Etch factor
 - d) Masking
8. For Electro Chemical Machining (ECM) of steel which is used as the electrolyte
 - a) kerosene
 - b) NaCl
 - c) Deionised water
 - d) HNO₃

9. In Laser Beam Machining (LBM) process the metal removal is by using
 - a) Light energy
 - b) Solar energy
 - c) Chemical energy
 - d) Mechanical energy
10. Electron Beam Gun is operated at
 - a) Atmospheric pressure
 - b) At 1.2 bar pressure above atmosphere
 - c) At 10 – 100 mTorr pressure
 - d) At 0.01 – 0.001 mTorr pressure

PART B (10 x 2 = 20 Marks)

11. Give the classification of unconventional machining process.
12. List the types of mechanical energy based UCM process.
13. What are the four major subsystem of an Abrasive Jet Machining process?
14. Give the materials which can be machined by ultrasonic machining.
15. List the commonly used dielectric fluid in EDM process.
16. Define Kerf.
17. Give the application of CHM process.
18. List out the applications of ECG process.
19. What are the types of laser used for material processing?
20. List the advantages of plasma arc cutting process.

PART C (5 x 14 = 70 Marks)

21. a) i) What are the industrial needs for unconventional machining processes? Explain with suitable example. (10)
ii) What are the important characteristics of UCM Process? (4)
(OR)
b) i) Give the complete classification of UCM process based on Thermal energy, 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) Give the operational summary and application of Ultrasonic Machining process. (4)
- ii) Explain the working principle of a Water Jet Machining (WJM) process with neat diagram. (10)

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 Chemical Machining (CHM) process with a neat sketch.

(OR)

- b) i) Give the classification of maskants and their uses. (10)
- ii) Give the advantages and disadvantages of Electro Chemical Grinding (ECG) process. (4)

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

(OR)

- b) i) Give the application of Electron Beam Machining (EBM) process. (4)
- ii) Explain the working principle of Plasma Arc Machining (PAM) process with the help of sketch. (10)
