Roll No. | | | | | | | | | | | | | Total No. of Pages : 02

Total No. of Questions : 08

M.Tech (ME) (2020 Onwards) (Sem.–2)

MODERN MANUFACTURING PROCESSES

Subject Code : MTME-203

M.Code : 74979

Time : 3 Hrs. Max. Marks : 100

INSTRUCTIONS TO CANDIDATES :

1. **Attempt any FIVE questions in all, out of EIGHT questions.**
2. **Each question carries TWENTY marks.**
3. **Assume any missing data suitably.**

1. a) Discuss the importance and applications of advanced manufacturing processes.

   b) What is the basic principle of abrasive jet technology? Describe the various types of abrasives used in this process and compare their performance.

2. a) Draw the schematic of an Electron Beam Machine and describe its various components. Discuss the effect of the various process parameters on the material removal rate and surface finish obtained in this process.

   b) Describe the procedure and process capabilities of wire-EDM process. Can this process be used to make tapered pieces? Explain.

3. What is ultrasonic machining? Derive an expression for the material removal rate obtained in this process. Explain why this process is not suitable for the machining of ductile materials?

4. What is the principle of electrochemical machining? List the common electrolytes used in this process. How is it different from chemical machining? Give the applications of ECM process.

5. a) Explain the principle and procedure of Thermal Metal Spraying process. What are the applications of this process?

   b) Briefly describe the Powder Metallurgy process. Name the various methods of metal powder production and explain any one of them in detail.

6. a) Explain the principle and procedure of Fused Deposition Modeling process.

   b) Describe the details of the machining set-up used for electrochemical grinding. What are the process parameters of this process?

7. a) Describe the various types of lasers that are used in manufacturing operations. What are the other applications of lasers besides machining?

   b) A laser beam with a power intensity of 10^5 W/mm^2 falls on a tungsten sheet. Find out the time required for the surface to reach melting temperature. The given thermal properties of tungsten are; melting temperature = 3400 °C, thermal conductivity = 2.15 W/cm-°C, volume specific heat = 2.71 J/cm^3-°C. Assume that 10% of the power of the beam is absorbed.

8. Write short notes on :

   a) Chemical Vapour Deposition

   b) Isostatic molding

   c) Plasma Arc Machining

   d) EDM electrode materials

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.