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

Total No. of Questions : 08

M.Tech (ME) (Sem–2)

MODERN MANUFACTURING PROCESSES

Subject Code : MTME-203

M.Code : 74979

Date of Examination : 19-06-2023

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) In what way has non-conventional machining process helped in developing new products? Discuss.

   b) Discuss the working principle of main components of water jet machining process by giving a neat sketch.

2. a) With the help of a suitable diagram, explain the working of Ultrasonic Machining and also explain the process parameters affecting machining performance in ultrasonic machining.

   b) With a neat sketch of electron beam machining explain its principle.

3. a) Discuss the main function and types of dielectric fluids used in Electric Discharge Machining.

   b) **Discuss the effect of following factors on MRR in EDM process.**

   (i) Current Density (ii) Work material hardness (iii) Pulse energy

4. a) Explain the mechanism of material removal in laser beam machining processes. Explain the lasing process in Gas Laser process giving neat sketch.

   b) What are the various EBM parameters? Discuss their influence on machining efficiency.

5. a) Give the schematic diagram of ECM, explain the function of horn. What are the effects of horn material and shape on the machining performance?

b) Describe the characteristic features of various types of plasma arc torches used in plasma Arc Machining.

6. a) Describe the mechanism of material removal and working of Electrochemical Stream Drilling (ESD) giving a neat sketch. Explain the applications and. limitations of the process.

b) What is 3D printing? How does a 3D printer work? What materials are used in 3D printing?

7. a) The powder metallurgy process can be competitive with processes such as casting and forging. Explain why this is so. Explain why the mechanical and physical properties of PM components depend on their density.

b) Explain different techniques to form the miniature product from metal powder.

8 a) What is additive manufacturing? State its benefits over subtractive manufacturing processes and also, name the seven categories of additive manufacturing processes with suitable applications of each category.

b) What is Physical Vapour Deposition (PVD)? Give the illustration of the process of PVD giving a neat sketch. Explain the applications of PVD process.

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.