

Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

B.Tech. (Mechanical Engineering) (Sem.-5)

**MANUFACTURING PROCESSES**

Subject Code : BTME-503-18

M.Code : 78249

Date of Examination: 23-11-2023

Time : 3 Hrs.

Max. Marks : 60

**INSTRUCTIONS TO CANDIDATES :**

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

**SECTION-A**

**1. Write briefly :**

- a) List the main advantages of the casting process.
- b) State the essential conditions that are to be kept in mind while designing risers.
- c) What are the advantages of hot working over cold working of metals?
- d) How do you define a tool life?
- e) Differentiate between drop forging and press forging.
- f) What are the factors on which the selection of a resist for use in chemical machining depends?
- g) Which type of workpiece is suitable for laser beam machining and why?
- h) Enlist the factors that influence the quality of cut in Plasma Arc Machining (PAM).
- i) Differentiate between brazing and soldering.
- j) What do you understand by the term Rapid Prototyping?

## SECTION-B

2. Compare the modulus method with that of Caine's method of fixing riser dimensions.
3. Show schematically the Merchant's force circle in orthogonal cutting. Derive the equations for shear and friction forces in terms of material properties and cutting process parameters.
4. Explain how the material is removed in Ultrasonic Machining (USM)? Also, discuss the various process parameters that significantly affect the process.
5. Summarize the rapid prototyping processes and the materials that can be used for them.
6. What is meant by solid-state welding? Explain the principle underlying the seam welding process. What are the faying surfaces in solid-state welding processes?

## SECTION-C

7. What do you understand by the term tooling? Describe briefly the various parameters and other important details that need to be considered during mould and die design.
8. What is the principle of Electrical Discharge Machining (EDM)? Discuss the various elements of the EDM process with the help of a typical schematic diagram. Why graphite is the preferred material for EDM tooling? What are the effects of (a) current in each spark and (b) spark frequency on metal removal rates and surface finish obtained?
9. Write a short note on the following :
  - a) What are the essential properties of moulding sand? Briefly explain them.
  - b) How do you compare a cutting tool made of CBN with that made of cemented carbides? Your answer should be based on tool material composition, structure and cutting performance.

**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.**