



# CBCS SCHEME

21MT34

USN

|  |  |  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|--|--|
|  |  |  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|--|--|

## Third Semester B.E. Degree Examination, Jan./Feb. 2023 Mechanics of Solids and Fluids

Time: 3 hrs.

Max. Marks: 100

*Note: Answer any FIVE full questions, choosing ONE full question from each module.*

### Module-1

- 1 a. What is diffusion? Explain Fick's first and second law of diffusion. (10 Marks)  
b. List and explain the factors affecting atomic diffusion. (10 Marks)

OR

- 2 a. Explain stress-strain diagrams showing ductile behavior of material. (10 Marks)  
b. Explain plastic deformation of single crystal by slip and twinning. (10 Marks)

### Module-2

- 3 a. Define composite and explain the classifications of composite materials. (10 Marks)  
b. Explain the following processes of composite production with neat sketch:  
i) Hand lay-up process ii) Pultrusion process. (10 Marks)

OR

- 4 a. Explain the following smart materials:  
i) Piezoelectric materials ii) Magneto - Strictive materials (10 Marks)  
b. What is Shape Memory Alloys and explain Shape Memory Effect. (10 Marks)

### Module-3

- 5 a. Explain the concept of manufacturing process with its classifications. (10 Marks)  
b. Explain steps involved in casting with casting process advantages and disadvantages. (10 Marks)

OR

- 6 a. Classify furnaces and explain the following :  
i) Electric Air furnace ii) Gas fired pit furnace. (10 Marks)  
b. Explain with neat diagram the following casting process:  
i) Squeeze casting. ii) Thixocasting (10 Marks)

### Module-4

- 7 a. Define welding and list the classification of welding. (10 Marks)  
b. Explain working principle of TIG welding process with neat sketch. (10 Marks)

OR

- 8 a. Explain with a neat sketch laser welding process. (10 Marks)  
b. Explain the following welding process:  
i) Spot welding ii) Seam welding (10 Marks)

### Module-5

- 9 a. Explain tool signature for single point cutting tool with a neat sketch. (10 Marks)  
b. Explain Merchant circle diagram with neat sketch. (10 Marks)

OR

- 10 a. Explain the procedure for tensile testing of metallic specimen using universal testing machine. (10 Marks)  
b. Explain the procedure for hardness test of specimen using Rockwell hardness tester. (10 Marks)

\*\*\*\*\*

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.