Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 70881

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2023.

Sixth/Seventh Semester

Mechanical Engineering

ME 8073 — UNCONVENTIONAL MACHINING PROCESSES

(Common to Manufacturing Engineering/Mechanical Engineering (Sandwich)/Mechanical and Automation Engineering/Production Engineering

(Regulations 2017)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define mixing ratio in abrasive jet machining. Also mention its significance.

2. State the functions of accumulator and intensifier in waterjet machining process.

3. Mention the properties to be required for wire electrode in wire-EDM.

4. Why deflection coil and grip cup are used in electron beam machining process?

5. Differentiate between isotropic and anisotropic etching.

6. What is the effect of ECM on fatigue properties of a material?

7. Define magneto-rheological effect.

8. List the advantages of magnetic abrasive finishing process.

9. State the working principle of magnetic float polishing process.

10. Cavities in silicon nitride can be produced in electrochemical discharge machining process. Justify your answer.

PART B — (5 × 13 = 65 marks)

11. (a) Classify modern machining processes on the basis of energy used and explain the working principle of any two energy processes.

Or

(b) Enumerate the various machining characteristics and the effect of process parameters involved in abrasive waterjet machining process.

12. (a) Discuss the construction, working, mechanism and process capabilities of Laser beam machining process.

Or

(b) With a neat schematic diagram explain the various types of torch systems used in plasma arc machining process.

13. (a) Discuss the steps involved and various types of maskants used in chemical machining process.

Or

(b) Describe the construction, working and effect of process parameters used in electrochemical machining process.

14. (a) Enumerate the steps in chemo-mechanical polishing process with their applications.

Or

(b) With a neat schematic discuss the components, effect of process parameters and process capabilities of abrasive flow machining process.

15. (a) Discuss the construction, working and steps involved in Electrolytic in-process Dressing (ELID) process.

Or

(b) Enumerate the construction, working and process capabilities of electric discharge diamond grinding process.

PART C — (1 × 15 = 15 marks)

16. (a) Discuss the effect of the following parameters on the material removal rate and surface finish in ultrasonic machining.

(i) amplitude and frequency (5)

(ii) abrasive size and concentration of abrasives. (5)

(iii) material hardness (5)

Or

(b) Analyze and explain how RLC circuit is used for controlling pulses in electric discharge machining process and provide the condition for maximum power generation and frequency of operation in relaxation generator.

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