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

Question Paper Code : 50778

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2024

Fifth/Sixth Semester

Mechanical Engineering

CME 387 – NON-TRADITIONAL MACHINING PROCESSES

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

(Regulations 2021)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Enlist the requirements that demand that use of AMPs.

2. List the reason why AJM is not recommended to machine ductile materials.

3. Mention the applications of electro chemical deburring process.

4. List down the limitations of electro chemical machining process.

5. Write the purpose of dielectric medium used in EDM process.

6. Why tugsten is not used as electrode material in PAM?

7. What is the need of abrasive particles in magnetic abrasive finishing process.

8. List the application of Magneto rheological abrasive flow finishing.

9. Mention the need for hybrid machining process and its advantages.

10. List the limitations of nontraditional machining process.

PART B — (5 × 13 = 65 marks)

11. (a) Classify modern machining processes on the basis of the type of energy employed. Also, state the mechanism of material removal, transfer media and energy sources used.

Or

(b) Explain the ultrasonic machining process and its principles. Also list the applications, advantages and limitations.

12. (a) Derive an equation for the maximum permissible feed rate during ECM. Also deduce the relationship for electrolyte temperature change for a given feed rate of tool.

Or

(b) Explain the mechanism of material removal during ECG and how it is different from ECM. Also justify how the life of the ECG wheel is much higher than conventional grinding wheel.

13. (a) Elaborate the working principle of wire EDM with a neat illustration. Discuss the effect of machining parameters on surface finish.

Or

(b) Explain the working principle of Ion beam machining with neat sketch.

14. (a) Explain the mechanism of material removal during the Abrasive flow machining process with neat sketch. Also, mention the process capabilities, process parameters and applications.

Or

(b) Discuss the chemo mechanical polishing with neat illustration and mention its application.

15. (a) Explain the benefits of hybrid unconventional machining methods and elaborate the challenges.

Or

(b) With neat sketch, explain laser beam assisted machining process and mention its advantages and limitations.

PART C — (1 × 15 = 15 marks)

16. (a) Discuss the Electron beam machining process with schematic and explain the process parameters and application.

Or

(b) Analyze the volumetric material removal rate in USM process by hammering mechanism.

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