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

Question Paper Code : 20784

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2018.

Sixth Semester

Mechanical Engineering

ME 6004 — UNCONVENTIONAL MACHINING PROCESSES

(Common to : Mechanical and Automation Engineering/Production Engineering)

(Regulations 2013)

(Also common to : PTME 6004 – Unconventional Machining Processes for B.E. (Part-Time) – Sixth Semester – Mechanical Engineering – Regulations – 2014)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. State the importance of unconventional machining process.

2. List down the various mechanical energy based on unconventional machining process.

3. Mention the process parameters that affects MRR in AJM.

4. List down the various transducers and mention their specific use in USM?

5. List down the various types of power supply circuits commonly used in EDM.

6. Sketch the principle of wire-cut EDM process.

7. State some of the applications of ECG and CHM process.

8. Mention the qualities of etchant.

9. Characterize transferable arc in plasma machining. State its necessity.

10. Identify the machining characteristics of EBM and LBM.

PART B — (5 × 13 = 65 marks)

11. (a) Write down the energy transfer media, energy source and mechanism of MRR for the Non-Traditional machining processes.

Or

(b) (i) Differentiate between the Traditional and Non- Traditional Machining process that are commercial use. (5)

(ii) Mention in detail the mandatory needs for newer developments of Unconventional machining Process. (8)

12. (a) (i) Describe the principles and equipment for WJM with neat sketch. (8)

(ii) Explain the different application and process control features of WJM. (5)

Or

(b) Discuss the effects of the following parameters on the MRR and surface finish in USM.

(i) Amplitude and frequency. (4)

(ii) Abrasives size. (3)

(iii) Concentration of Abrasives. (3)

(iv) Material hardness. (3)

13. (a) (i) Identify the machining characteristics of EDM and WEDM. (8)

(ii) Describe the type of flushing techniques used in EDM. (5)

Or

(b) Explain the influence of different process parameters on the performance and applications of EDM and WEDM process.

14. (a) (i) List out the advantages of ECG over conventional grinding. (8)

(ii) Describe the chemistry involved n ECM process. (5)

Or

(b) Explain in detail the ECM process with neat sketch and also mention the advantages and applications.

15. (a) Describe PAM process with neat sketch and write about its process parameters, advantage and applications.

Or

(b) Explain the process of LBM and EBM with a neat sketch.

PART C — (1 × 15 = 15 marks)

16. (a) Demonstrate in detail with respect to EDM process.

(i) The mechanism of material removal and $(7\frac{1}{2})$

(ii) Evaluation of MRR of different tool materials. $(7\frac{1}{2})$

Or

(b) Give details of various applications of thermal energy based non-contact type advanced machining process.
