

B. E. PRODUCTION ENGINEERING FOURTH YEAR FIRST SEMESTER EXAMINATION, 2019

MICRO MANUFACTURING PROCESSES AND SYSTEMS

Time: Three Hours

Full Marks:100

Answer ANY FIVE questions

Q1. a) What is Micro-Manufacturing? What are the characteristics of micro-manufacturing processes?

b) What are the classifications of Micro-Manufacturing?

c) What are the various advanced micro-machining operations for industrial applications?
(7+6+7)

Q2. a) What are the importance of micro-machining?

b) Discuss on various methods of material removal in micro-machining?

c) Why is ECM suitable for micro-machining applications?
(5+10+5)

Q3. a) Distinguish between ECM and micro-ECM process.

b) Discuss on various requirements of Electrochemical micro-machining system with sketch

c) What are advantages and limitations of micro-ECM process?
(5+10+5)

Q4. a) Distinguish between EDM and Micro-EDM process.

b) Discuss on methods of Micro-tool development?

c) What are applications of micro-EDM process?
(5+10+5)

Q5. a) Discuss on various classes of 3D additive micro-manufacturing processes with respect to different forms of input build materials?

b) What is key hole laser micro-welding process? Mention the advantages of laser micro-welding?

c) Discuss on laser marking characteristics for assessment of good quality laser mark.
(10+5+5)

Q6. a) What are the basic requirements for micro-ECDM system for carrying out micro-machining operation?

b) What are the system requirements for laser micro-turning operation?

c) What do you understand by micro-factory?
(8+7+5)

Q7. a) What are the various techniques of MEMS based Manufacturing?

b) What are the various methods of micro-forming? Discuss on any one method with its applications.

c) Discuss on various micro-measurement techniques involved in the area of micro-manufacturing?
(7+6+7)

Q8. a) Discuss on the system requirements of micro-USM process with sketch. What are the various machining applications of micro-USM process?

b) Discuss on various types of laser machining systems for micro-machining applications.
(10+10)
