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APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S8 (S,FE) (FT/WP) Examinations September 2026 (2019 Scheme)

Course Code: MET464
Course Name: MICRO AND NANO MANUFACTURING

Duration: 3 Hours

Max. Marks: 100

PART A
Answer all questions, each carries 3 marks.

		Marks
1	What are the advantages of using silicon as a substrate material in micro fabrication?	(3)
2	Explain why precision is critical in micro turning compared to macro turning.	(3)
3	State three process parameters influencing material removal in abrasive jet micro machining.	(3)
4	Write any three advantages of micro moulding over traditional moulding.	(3)
5	Describe the role of carbonyl iron particles in magnetorheological finishing.	(3)
6	Differentiate elastic emission machining from conventional polishing methods.	(3)
7	State the principle of chemical vapour deposition (CVD) for diamond films.	(3)
8	Write three advantages of using laser beam micro welding in micro joining.	(3)
9	Mention any three limitations of scanning white light interferometry technology.	(3)
10	Write any three merits of on-machine metrology.	(3)

PART B
Answer any one full question from each module, each carries 14 marks.

Module I

11	Discuss micro milling in detail, including tool design, process parameters, and applications.	(14)

OR

12	With a neat diagram, explain the principle and process of micro grinding. Discuss its process parameters and applications.	(14)

Module II

13	Describe the principle, process, and applications of Water Abrasive Jet Micro Machining (WAJMM).	(14)

OR

14 Discuss different micro moulding processes. Explain reaction injection moulding and hot embossing with applications. (14)

Module III

15 a) With a neat diagram, explain the principle and process of Ion Beam Machining (IBM). (10)

b) List the advantages and limitations of Ion Beam Machining. (4)

OR

16 a) Explain the material removal mechanism in Chemical Mechanical Polishing (CMP) and mention its major applications. (8)

b) Explain the principle and applications of Elastic Emission Machining (EEM). (6)

Module IV

17 Describe the principle, process, and applications of CVD diamond technology. (14)

OR

18 With diagrams, explain laser beam micro welding and electron beam micro welding. (14)

Module V

19 Explain the working principle of confocal microscopy with a neat diagram. Discuss its advantages, particularly for imaging biological samples. (14)

OR

20 With a neat sketch, explain the principle and working of Scanning probe microscopy. (14)

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