Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S8 (R,S)(FT/WP) Examinations April 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	State any three challenges in transitioning from macro to micro fabrication.	(3)
2	What are the advantages of micro-extrusion in biomedical implants?	(3)
3	Define and give one use of Focused Ion Beam machining.	(3)
4	List down three applications of Micro Laser Beam machining.	(3)
5	List any three applications of Chemical Mechanical Process?	(3)
6	Define Magnetic Float polishing(MFP).Mention one key advantage.	(3)
7	Write a short note on LIGA and its steps.	(3)
8	What are the uses of Scanning Tunnelling Microscopy in nano metrology?	(3)
9	Define Optical Microscopy and its resolution limits.	(3)
10	Mention the relevance of On-Machine Metrology in precision machining.	(3)

PART B

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

Module I

11	a)	Describe micro extrusion process with neat diagram.	(7)
	b)	List the tools and explain the procedure of micro-drilling.	(7)
		OR	
12	a)	Explain the basic principles of micro turning process.	(7)
	b)	Discuss major materials used in micro mechanical machining.	(7)

Module II

13	a)	Explain Micro-Wire EDM process with applications.	(8)
	b)	Discuss the working and relevance of micro-moulding in MEMS.	(6)
		OR	
14	a)	Describe Micro Laser Beam Machining (LBM) with a neat diagram.	(8)

b) Explain principle and applications of Micro-EBM. (6)

Module III

15 a) Explain with neat sketch Magnetorheological Finishing (MRF). (7)

b) Describe any one process suitable for ultra-precision finishing of optical lenses. (7)

OR

16 a) Compare and contrast CMP and EEM. (8)

b) Explain the principle of Magnetic Float Polishing. (6)

Module IV

17 a) Write short notes on CN Tube Transistors and their operation. (8)

b) Discuss how nano-fabrication differs from micro-fabrication with examples. (6)

OR

18 a) Explain Electron Beam Welding technique for micro-scale. (8)

b) Write a brief note on soft lithography applications in nano-bio devices. (6)

Module V

19 a) Compare STM and AFM in nano-inspection. (7)

b) Discuss principle, advantages, and limitations of Confocal Microscopy. (7)

OR

20 a) Describe working of Scanning Tunnelling Microscopy with a neat sketch. (8)

b) Explain any two techniques of On-Machine Metrology. (6)

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