



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**

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|----|--|-----|
| 11 | a) Describe micro extrusion process with neat diagram.         | (7) |
|    | b) List the tools and explain the procedure of micro-drilling. | (7) |

OR

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|----|--|-----|
| 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

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|----|---|-----|
| 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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