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Reg No.: \_\_\_\_\_

Name: \_\_\_\_\_

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S5 (R, S) / S3 (PT) (R, S) Examination December 2023 (2019 Scheme)



Course Code: MET 307

Course Name: MACHINE TOOLS AND METROLOGY

Max. Marks: 100

Duration: 3 Hours

**PART A**

*(Answer all questions; each question carries 3 marks)*

		Marks
1	Differentiate between up milling and down milling with sketches.	3
2	Write any three differences between turret and capstan Lathe.	3
3	What is honing?	3
4	Differentiate between twist drill and straight flute drill.	3
5	What are the differences of travelling head shaper from other shapers?	3
6	Differentiate between forming and knurling operations.	3
7	Why Cast Iron is preferred for Lathe bed?	3
8	What is metrology? State its objectives.	3
9	Differentiate between line standard and end standard.	3
10	What is the advantage of using the wavelength standard?	3

**PART B**

*(Answer one full question from each module, each question carries 14 marks)*

**Module -1**

- |    |                                                                                  |    |
|----|----------------------------------------------------------------------------------|----|
| 11 | a) With a neat sketch, explain various operations performed in drilling machine. | 10 |
|    | b) List the operations performed on shaper.                                      | 4  |
| 12 | a) Which are the major parts of carriage of a lathe? Explain functions of each.  | 7  |
|    | b) Explain the differences between turret and capstan Lathe.                     | 7  |

**Module -2**

- |    |                                                                         |   |
|----|-------------------------------------------------------------------------|---|
| 13 | a) With a neat sketch explain the principal parts of a milling machine. | 7 |
|    | b) Illustrate the milling cutter nomenclature with a neat diagram.      | 7 |
| 14 | a) What is lapping? What are its advantages?                            | 7 |
|    | b) Compare Glazing & Loading of grinding wheels.                        | 7 |

**Module -3**

- 15 a) With a neat sketch, explain the different type of broaching process. 9  
b) Explain the basic principle of broaching. 5
- 16 a) With a neat sketch explain the gear hobbing machine. 10  
b) List the gear finishing methods. 4

**Module -4**

- 17 a) With a neat sketch explain the classification of gauges. 9  
b) State and explain Taylor's principle for gauge design. 5
- 18 a) Explain the classification of fit with suitable diagram. 9  
b) Differentiate between tolerance and allowance. 5

**Module -5**

- 19 a) Describe the method of evaluating roughness using 8  
i. Peak to valley high method  
ii. CLA method
- b) List the advantage and application of CMM. 6
- 20 a) Sketch and describe the optical arrangement of Laser Interferometer. 9  
b) Compare mechanical and pneumatic comparator. 5

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