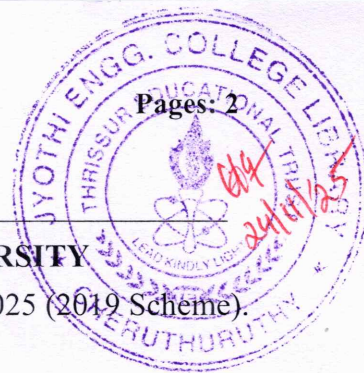


Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S5 (R,S) (FT/WP)(S3 PT) Examination November 2025 (2019 Scheme).

**Course Code: MET307****Course Name: MACHINE TOOLS AND METROLOGY**

Max. Marks: 100

Duration: 3 Hours

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

Marks

- | | | |
|----|---|---|
| 1 | Define the terms speed, feed and depth of cut in a facing operation. | 3 |
| 2 | List any six operations that can be performed in a lathe. | 3 |
| 3 | How will you calculate the machining time in a drilling operation? | 3 |
| 4 | Differentiate between lapping and super finishing processes. | 3 |
| 5 | Mention the various elements of a broaching tool. | 3 |
| 6 | What is a hob? How is a hobbing tool used to make a gear? | 3 |
| 7 | Differentiate between the terms upper limit, lower limit and tolerance. | 3 |
| 8 | What is a dial gauge? What is its practical use? | 3 |
| 9 | Define the term straightness. How is it measured and quantified? | 3 |
| 10 | What is a laser interferometer? What is its use? | 3 |

PART B*(Answer one full question from each module, each question carries 14 marks)***Module -1**

- | | | |
|----|--|---|
| 11 | a) With a neat sketch explain the various parts of any one type of an automatic lathe. | 7 |
| | b) With neat sketches explain various types of drill bits and their uses. | 7 |
| 12 | a) With the help of neat sketches explain the various parts of a tool room lathe and the accuracy that can be achieved by it. | 7 |
| | b) With a neat sketch explain the crank and slotted lever shaper mechanism. How length of stroke and speed are adjusted in it? | 7 |

Module -2

- | | | |
|----|---|---|
| 13 | a) With the help of a neat sketch explain the various parts of any one type of milling machine. | 7 |
| | b) With a neat sketch explain the external centreless grinding process. What are its | 7 |

applications?

- 14 a) With a neat sketch explain the various elements of a plain milling cutter. 7
- b) Explain the terms truing, glazing, loading and balancing related to a grinding wheel. 7

Module -3

- 15 a) With a neat diagram explain the worm gear cutting process. 7
- b) With the help of neat sketches explain the various parts of a horizontal broaching machine and a vertical broaching machine. 7
- 16 a) With a neat sketch explain the spur gear generating process. 7
- b) With the help of neat diagrams explain any three gear finishing operations. 7

Module -4

- 17 a) What is an error in measurement? How various types of errors are measured and quantified? 7
- b) With neat sketches explain the clearance fit, the transition fit and the interference fit. Where are they used practically? 7
- 18 a) With a neat sketch explain the various parts of a dial indicator? How can a dial indicator be used as a comparator? 7
- b) What are primary, secondary and tertiary standards? How do they use in measurement and calibration process? 7

Module -5

- 19 a) What are the instruments used for checking surface angles? How will you measure the taper of a taper sleeve? 7
- b) With the help of neat diagrams explain the parts and working of a tool maker's microscope. 7
- 20 a) What are the various elements of a screw thread to be measured and how are they measured practically? 7
- b) With the help of a neat diagram explain the principle, parts and working of a Coordinate Measuring Machine (CMM). 7
