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

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