Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S6 (R,S) Examination April 2025 (2019 Scheme)

Course Code: RAT342

Course Name: MECHANICAL MEASUREMENTS AND METROLOGY

Max. Marks: 100 **Duration: 3 Hours**

PART A

Answer all questions, each carries 3 marks. Marks

1		What are the needs of mechanical measurements?	(3)
2		Explain the method of linear measurement using any one instrument.	(3)
3		List any 3 methods employed for measuring torque.	(3)
4		What is a strain gauge?	(3)
5		What is resistive potentiometer?	(3)
6		What is thermocouple? List out any two advantages of thermocouple.	(3)
7		Distinguish between line standards and end standards.	(3)
8		Explain the operational principle of an optical flat.	(3)
9		What is secondary texture of a surface?	(3)
10		Explain the working principle of touch trigger probe.	(3)

PART B

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

Module I

11	a)	Explain in details the errors and type of errors in measurements.	(6)
	b)	Describe the procedure for linear measurement using a vernier calliper, accompanied by a well-drawn illustration.	(8)

OR

12	a)	Explain the structure of generalized measuring system.	(6)
	b)	Illustrate the different components of a bevel protractor with a clear diagram.	(8)

Module II

13	a)	Briefly describe one method of torque measurement with an appropriate figure.	(8)

	b)	Explain mechanical strain gauge? What are its limitations?	(6)

OR

14	a)	Elaborate on a force measurement method using a clear illustration.	(8)
	b)	Define the gauge factor and outline its significances.	(6)

Module III

15	a)	Explain the working of LVDT? Mention the advantages of LVDT.	(8)
	b)	Explain the working of bimetallic strip type temperature measurement system.	(6)

OR

16	a)	Provide a clear illustration and explanation of a method employed for measuring displacement.	(8)
	b)	Discuss the construction and working of an optical pyrometer.	(6)

Module IV

17	a)	Explain three wire method for measuring effective diameter of screw.	(10)
	b)	Differentiate accuracy from precision.	(4)

OR

18	a)	Explain gear tooth terminology with neat sketch.	(8)
	b)	Explain tool maker's microscope with suitable figure.	(6)

Module V

19	a)	List and explain the types of defects found in surface.	(6)
	b)	Explain the working principle of mechanical comparator with a neat figure.	(8)

OR

20	a)	Define surface texture and illustrate the associated terminology using an appropriate diagram.	(8)
	b)	Mention the types of coordinate measuring machine (CMM).	(6)

****