Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Sixth Semester B.Tech Degree (R,S) Examination May 2024 (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		Explain the following terms a) Hysteresis b) Drift	(3)
2		With suitable figure explain bevel protractor.	(3)
3		Write a short note on load cell.	(3)
4		Define gauge factor? Write its significances.	(3)
5		What is a resistive potentiometer?	(3)
6		Write a short note on pyrometer.	(3)
7		What is the difference between accuracy and precision?	(3)
8		Explain the principle of interferometers.	(3)
9		Briefly explain flaws and lay in surface topology	(3)
10		What is the differences between contact and non-contact probe	(3)

PART B

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

Module I

11	a)	Explain generalized measurement system element with block diagram. Describe its function with suitable examples.	(10)
	b)	Explain how slip gauges are checked for quality.	(4)

OR

12	a)	Describe the different types of errors in measurement and their causes.	(10)
	b)	Why is sine bar not suitable for measuring angles above 45 degree ?	(4)

Module II

13	a)	Explain the working of servo-controlled dynamometer with neat sketch.	(6)
	b)	Detail two types of strain gauges, illustrating each with relevant sketches.	(8)

OR

14	a)	Explain the Prony brake dynamometer, including an appropriate figure.	(6)

b) Define the term "strain gauge" and provide an explanation of a specific strain gauge, supported by an appropriate diagram. (8)

Module III

15 a) Examine any one methods of displacement measurement, outlining their advantages and disadvantages. (8)

b) Illustrate the construction and functioning of an optical pyrometer with a figure, providing a comprehensive explanation. (6)

OR

16 a) Explain the operation of an LVDT with a clear sketch and enumerate its advantages. (8)

b) Explain the method of measuring temperature of a body using electrical resistance thermistor. (6)

Module IV

17 a) Describe the terminology related to gear teeth, complemented by a clear and detailed sketch. (8)

b) Explain the working and construction of optical flat (6)

OR

18 a) Enumerate the distinctions between line standards and end standards. (6)

b) Define an auto-collimator and illustrate the principles and construction of the device with clear and detailed sketches. (8)

Module V

19 a) With suitable diagram, discuss the elements of surface roughness. (8)

b) With suitable diagram, explain pneumatic comparator. (6)

OR

20 a) With suitable figure, explain any one surface roughness measurement method. (8)

b) Differentiate mechanical comparators from electrical comparators. (6)

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