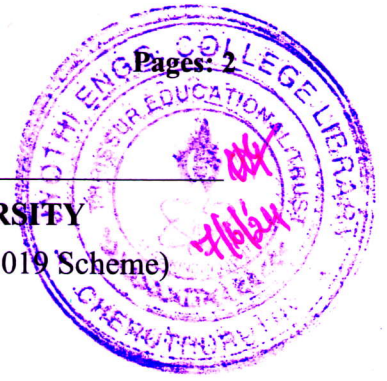


Reg No.: \_\_\_\_\_

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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