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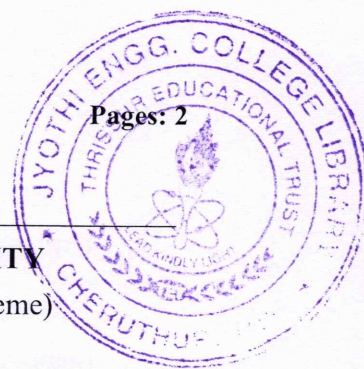
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Reg No.: \_\_\_\_\_

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)

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