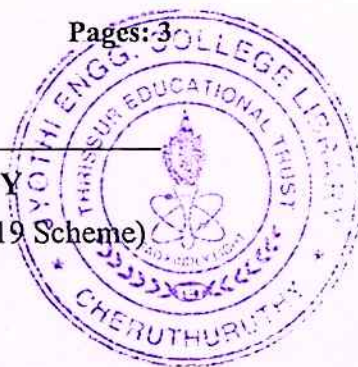


Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S3 (S,FE) (FT/WP/S1PT) Examinations May/June 2026 (2019 Scheme)



Course Code: EET203

Course Name: MEASUREMENTS AND INSTRUMENTATION

Max. Marks: 100

Duration: 3 Hours

PART A

Answer all questions. Each question carries 3 marks

Marks

- 1 Eddy current damping is preferred over other damping mechanisms used in electrical instruments. Justify the statement with help of neat figure. (3)
- 2 What are the different standards of measurements? (3)
- 3 List the advantages of smart energy meters over conventional energy meters (3)
- 4 What are the features incorporated in an electrodynamicometer type wattmeter for low power factor (LPF) measurement (3)
- 5 Explain loss of charge method for insulation resistance. (3)
- 6 Explain the phenomenon of Hall Effect. How is the phenomenon applicable in high DC current measurement? (3)
- 7 Explain the principle of operation of thermistor (3)
- 8 Describe how B-H curve of a magnetic material can be determined. (3)
- 9 With neat figure explain the working of ultrasonic flow meter. (3)
- 10 Explain the operation of a digital voltmeter with relevant diagram. (3)

PART B

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

Module 1

- 11(a) Elaborate on the classification of instruments. What are the desirable factors that guide the selection of an instrument for a particular application? (8)
- 11(b) The coil of a measuring instrument has a resistance of 1Ω and the instrument (6)

has a full scale deflection of 250V when a resistance of 4999Ω is connected in series with it. Find

a) The current range of the instrument when used as an ammeter with the coil connected across a shunt of $1/499\Omega$.

b) The shunt resistance for the instrument to give a full scale deflection of 50 A.

12(a) Explain the importance of controlling torque in electrical instruments. (8)

How is controlling torque provided in PMMC instruments

12(b) With the help of a practical example explain the need for calibration. (6)

Module 2

13(a) With neat figure explain the construction and working of Dynamometer type wattmeter. (8)

13(b) The power flowing in a 3 phase 3 wire balanced load system is measured by two wattmeter method. The reading of wattmeter A is 6000 W and that of wattmeter B is -1000 W. Find the power factor of the system (6)

14 With neat figure explain the construction and working of Induction type single phase energy meter. With the help of a block diagram explain how electronic energy meter is different from induction type energy meter? What are the merits of electronic energy meters over induction type energy meters? (14)

Module 3

15(a) With the help of circuit diagram explain how unknown capacitance is measured using Schering Bridge. Derive the expression for unknown capacitance. (8)

15(b) Explain how high voltage measurement can be performed using Sphere Gaps. (6)

16(a) Explain Ammeter-Voltmeter method for measurement of unknown resistance. (6)

16(b) With the help of circuit diagram explain how unknown self-inductance is measured using Maxwell's Inductance bridge. Derive the expression for unknown capacitance. (8)

Module 4

17(a) How is hysteresis loss determined from hysteresis curve? Explain the (6)

importance of hysteresis curve

- 17(b) Explain the measurement of flux in a ring specimen using Flux meter. (8)
- 18(a) With the help of a figure explain the construction and working of a Ballistic Galvanometer. (8)
- 18(b) Explain the working principle of photovoltaic cells with the help of a figure. (6)

Module 5

- 19(a) Explain the basic principle and working of LVDT? (6)
- 19(b) Explain the working principle of a piezoelectric transducer. Elaborate on the different modes of operation. (8)
- 20(a) Explain the principle of operation of general purpose CRO with the help of a block diagram. (6)
- 20(b) With neat figures explain the working principle of Load cell and Strain gauge. (8)
