Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S3 (S,FE) (FT/WP) / S1 (PT) Examination November/December 2025 (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	How can the quality of a measurement be judged?	(3)
2	For a particular measurement, the accuracy is found to be ±0.5% and precision ±1%. What does this imply?	(3)
3	How overcompensation for friction affect Energymeter. Is it possible to overcome this issue?	(3)
4	"Never open the secondary winding circuit of a current transformer while its primary is energized". Justify.	(3)
5	Explain the role of standard cell in standardising a potentiometer.	(3)
6	Compare an AC bridges with a Wheatstone bridge.	(3)
7	With neat figures explain the characteristics of thermistors.	(3)
8	With neat figure state the laws of illumination.	(3)
9	List down the uses of Piezo-electric materials and transducers.	(3)
10	Explain ultrasonic method of flow measurement.	(3)

PART B

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

Module 1

11(a)	With neat figures explain the construction and working of repulsion type moving iron instrument. Explain how the voltage range of moving iron instruments can be extended.	(9)
11(b)	Derive the torque equation and show that the scale of a moving iron instrument is non-uniform.	(5)
12(a)	Compare gravity control and spring control with neat figure. Explain the	(10)

effect of these controls on shape of the scale.

12(b) A gravity controlled ammeter shows a deflection of 90° corresponding to current of 5A. Plot the shape of scale of the ammeter whose deflecting torque varies as the square of the current passing through it. (4)

Module 2

13 Derive the expression for transformation ratio and phase angle error of a current transformer using its equivalent circuit and phasor diagram (14)

14(a) With neat figure explain the construction of single phase Energymeter. (6)

14(b) With neat phasor diagram show that the number of revolutions made by an energymeter is proportional to the energy consumed. Explain any one lag adjustment device used in energymeter with neat figure. (8)

Module 3

15 Explain inductance measurement using Maxwell's Inductance Capacitance Bridge with neat circuit diagram and phasor diagram. Also derive the general equation of Bridge balance with neat figure. List its advantages and disadvantages. (14)

16(a) With neat figure explain how sphere gaps measure voltages. What are the advantages and disadvantages of using sphere gaps? List any two precautions while operating sphere gap. (8)

16(b) With neat figures explain any two applications of DC Potentiometer (6)

Module 4

17(a) Using wattmeter explain how iron loss in magnetic materials can be measured employing Lloyd Fisher Square method. (8)

17(b) Explain with neat figure how hysteresis loop can be determined using the method of reversals. (6)

18(a) What are thermistors? Explain the construction of thermistors. Describe any three applications of thermistors and list down the salient features of thermistors. (9)

18(b) What are photoconductive cells? Explain their characteristics. (5)

Module 5

19(a)	With neat block diagram explain the vertical and horizontal deflection system of an oscilloscope.	(8)
19(b)	Make use of the block diagram to explain the working of a digital storage oscilloscope.	(6)
20(a)	Describe strain gauge. With necessary equations show how the resistance of an element changes when strained. Derive gauge factor. What are the merits and demerits of strain gauge	(8)
20(b)	With neat sketch explain electromagnetic flow meter. What are the advantages and limitations of electromagnetic flow meter?	(6)

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