Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Third Semester B.Tech Degree Examination December 2021 (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	Define the following terms in measurement i) Accuracy ii) Resolution iii) Precision	(3)
2	What are the different standards of measurements?	(3)
3	Explain the working of Hall effect multipliers.	(3)
4	What is a TOD meter?	(3)
5	Derive the equation for capacitance using Schering bridge.	(3)
6	How high voltage is tested using sphere gaps?	(3)
7	Write short notes on RTD.	(3)
8	Describe anyone method of permeability measurement.	(3)
9	Explain the working of electromagnetic flow meter.	(3)
10	Explain any three types of oscilloscope probes.	(3)

PART B

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

Module 1

11	(a)	Explain with neat diagram the construction and principle of operation of a PMMC instrument. Derive the expression for deflection.	(7)
	(b)	Derive the expression for deflection for spring controlled attraction type moving iron instrument. Also explain the type of damping provided in moving iron instruments.	(7)
12	(a)	What is the different torques needed for proper operation of an indicating instrument?	(8)

	(b)	The coil of a measuring instrument has a resistance of 1Ω and the instrument has a full scale deflection of 250V when a resistance of 4999Ω is connected in series with it. Find I. The current range of the instrument when used as an ammeter with the coil connected across a shunt of 1/499 Ω. II. The shunt resistance for the instrument to give a full scale deflection of 50 A.	(6)

Module 2

13	(a)	With neat diagram explain the construction and working of an electrodynamometer wattmeter.	(8)
	(b)	Derive the expression for torque of a single phase induction type energy meter.	(6)
14	(a)	Derive the expression for ratio and phase angle error in a current transformer.	(10)
	(b)	Explain how power can be measured in a 3-phase circuit using two wattmeters with a neat circuit diagram in unbalanced load condition.	(4)

Module 3

15	(a)	With the help of diagram explain the working of Kelvin double bridge.	(7)
	(b)	Draw the circuit and phasor diagram of Maxwell's Inductance bridge and derive the expression for unknown inductance.	(7)
16	(a)	Explain the working of a Meggar with the help of a neat diagram.	(6)
	(b)	What is a DC potentiometer? Explain the calibration of ammeter and voltmeter using it with neat diagrams.	(8)

Module 4

17	(a)	Explain the method of flux measurement using ballistic galvanometer.	(6)
	(b)	Describe the construction and working of photoconductive and photovoltaic cells.	(8)
18	(a)	Explain in detail the measurement of iron losses in a magnetic material using Llyod-Fisher square wattmeter method.	(8)
	(b)	Explain the temperature measurement using thermocouples.	(6)

Module 5

19	(a)	Explain the basic principle and working of LVDT.	(6)
	(b)	Write short notes on I. Digital Multi Meter and II. Clamp on meter	(8)
20	(a)	How strain is measured using a strain gauge?	(4)
	(b)	Draw a neat block diagram of a Cathode Ray Oscilloscope and describe the function of each block in detail.	(10)

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