E
00B-2FRRV

03PCEET205052504

Pages: 3

Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S2 (S) Examination January 2026 (2024 Scheme)

Course Code: PCEET205

Course Name: - MEASUREMENTS AND INSTRUMENTATION

Max. Marks: 60 Duration: 2 hours 30 minutes

PART A

(Answer all questions. Each question carries 3 marks)

		CO	Marks
1	Draw the block diagram of a typical measuring instrument and indicate its functional elements.	CO 1	(3)
2	A $0-100\ mA$, PMMC ammeter with an internal resistance of $100\ \Omega$ is to be used as a $0-10\ A$ ammeter. Calculate the value of shunt resistance required in Ohms. Also, determine the multiplying power of the shunt.	CO 2	(3)
3	With the help of a schematic diagram, explain the construction of a flux meter.	CO 3	(3)
4	Derive an equation for the unknown resistance when a Wheatstone bridge is balanced. Draw the circuit diagram.	CO 3	(3)
5	The power in a balanced three-phase system is measured using two wattmeter method. The first watt meter reads $W_1 = 1000\ W$ and the second wattmeter reads $W_2 = 500\ W$. Find out the power factor of the load.	CO2	(3)
6	List three advantages of a smart energy meter when compared to a traditional energy meter.	CO5	(3)
7	How does a DC tachometer measure the rotational speed of a motor?	CO 4	(3)
8	Draw the schematic diagram of an electromagnetic type of flow meter. Explain its working.	CO 4	(3)

PART B

(Answer any one full question from each module, each question carries 9 marks)

Module -1

9	a)	Explain the classification of standards of measurement.	CO 1	(7)
	b)	List two advantages of maintaining a hierarchy of standards in the field of measurement and instrumentation?	CO 1	(2)

10		What are systematic errors in measurement? Explain any three types of systematic errors with suitable examples.	CO 1	(9)

Module -2

11	a)	Draw the circuit diagram of Wein bridge. Derive an expression for the frequency of the input voltage.	CO 3	(5)
	b)	The bridge circuit shown in figure (1) is balanced when the frequency of the voltage source, E is 1 kHz. Find out the value of unknown resistance, R_1 and inductance, L_1.	CO 3	(4)

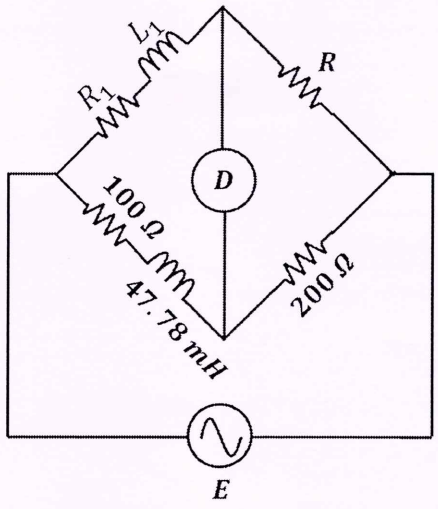

Figure (1)

12		With the help of a neat circuit diagram, explain the determination of B-H curve and hysteresis loop by using method of reversals.	CO 3	(9)

Module -3

13	a)	Draw the circuit schematic diagram of a two-element induction type energy meter used for measurement of energy consumed by a three-phase load and label the parts.	CO 2	(5)
	b)	What is a TOD meter? Why is TOD metering relevant in industrial loads?	CO 2	(4)
14	a)	Differentiate between current transformer (CT) and potential transformer (PT)	CO 2	(4)
	b)	Explain the working of a dynamometer type wattmeter with the help of a schematic diagram.	CO 2	(5)

Module -4

15	a)	What is meant by signal conditioning? Why is it important in data acquisition systems?	CO 5	(5)
	b)	List four advantages of virtual instrumentation system over traditional instrumentation system.	CO 6	(4)
16	a)	Explain the working principle of a strain gauge.	CO 4	(3)
	b)	List any two types of strain gauges and describe their constructional and operational features.	CO 4	(6)

***