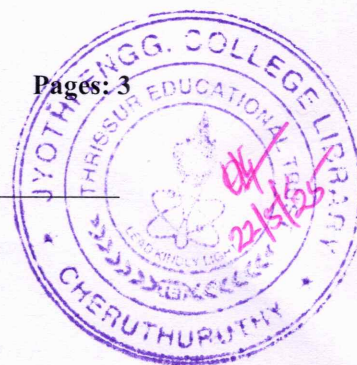Reg No.:_____   Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S2 (R) Examination May 2025 (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

		CO	Marks
1	List and explain any three static characteristics of a measuring instrument.	CO 1	(3)
2	With a neat diagram, explain how gravity control method can produce controlling torque in a measuring instrument.	CO 1	(3)
3	Explain the loss of charge method for the measurement of insulation resistance with the help of a circuit diagram. Write the equation for unknown insulation resistance.	CO 3	(3)
4	Explain the principle of operation of a Q-meter with the help of necessary equations and circuit diagram.	CO 3	(3)
5	List three features each of current transformer (CT) and potential transformer (PT).	CO 2	(3)
6	Explain the following: (i) TOD meter (ii) Bidirectional energy meter.	CO 2	(3)
7	Draw a neat schematic diagram of a Resistance Temperature Detector (RTD) and explain its working.	CO 4	(3)
8	List three advantages of virtual instrumentation systems over traditional instrumentation systems.	CO 6	(3)

PART B

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

Module -1

		CO	Marks
9	With a neat schematic diagram, explain the construction and working principle of an attraction type moving iron instrument.	CO 2	(9)
10 a)	What is the necessity of damping torque in a measuring instrument?	CO 2	(3)

b) List and explain any three methods to produce damping torque in a measuring instrument.   CO 2   (6)

Module -2

11 a) With the help of a neat circuit diagram, explain the method of low resistance measurement using Kelvin double bridge. Derive necessary equations.   CO 3   (7)

b) Why is a Wheatstone bridge not suitable for accurate measurement of very low resistances?   CO 3   (2)

12 With the help of a neat circuit diagram, explain how an unknown capacitance with an equivalent series resistance (ESR) can be measured using Schering bridge. Derive the equation for the unknown capacitance and its ESR and draw the phasor diagram.   CO 3   (9)

Module -3

13 a) Power in a three-phase circuit with phase sequence RYB is measured using two wattmeter method as shown in figure (1). Draw the phasor diagram and determine the readings of the watt meters, W_1 and W_2 and the total active power consumed by the load.   CO 2   (6)
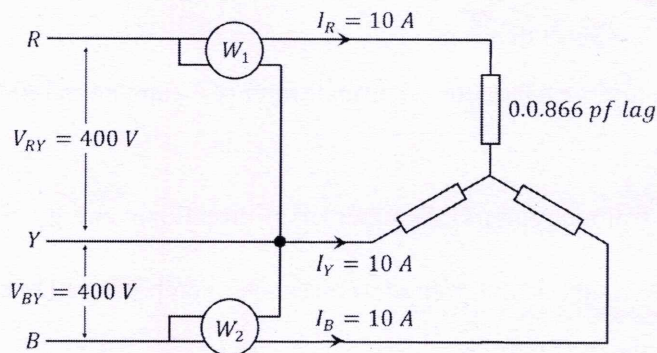

Figure (1)

b) In the above circuit, determine the total reactive power consumed by the load with the help of wattmeter readings W_1 and W_2.   CO 2   (3)

14 a) With the help of a neat schematic diagram, explain the working of an induction type energy meter.   CO 2   (6)

b) What is meant by *creeping* in induction type energy meters? What is the reason for creeping and how it can be eliminated?   CO 2   (3)

Module -4

15	a)	What is meant by a transducer? Give two examples of temperature transducer.	CO 4	(3)
	b)	What is strain gauge? List any two types of strain gauges and explain their features.	CO 4	(6)
16	a)	Draw a neat schematic diagram of a cathode ray oscilloscope (CRO). Explain the function of each part.	CO 5	(7)
	b)	What is the use of a harmonic analyser?	CO 5	(2)

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