POKHARA UNIVERSITY

Level: Bachelor
Programme: BE
Course: Instrumentation (New)

Semester: Fall

Year : 2023
Full Marks: 100
Pass Marks: 45
Time :3hrs.

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Attempt all the questions.

1.	a)	Differentiate between intelligent versus dumb instrumentation. Draw generalized block diagram for instrumentation system and discuss its various components with necessary explanations.	7
	b)	Explain Construction operation with application of transducer.	8
2.	a)	The AC bridge ABCD has the details. The arm AB has resistance of 100 Ω in parallel with capacitance of 50 μF. The BC has non inductive resistance of 70 Ω. The arm DC is unknown and has resistance in series with inductance. The arm AD has resistance 60 Ω by using the balancing conditions, determine the values of unknowns.	7
		OR	
		Explain the methods for measurement of high resistances.	
	b)	What is D'Arsonval Principal? How is this principle used to create ammeter and voltmeter. Explain with circuit diagram and necessary equations of ammeter and voltmeter.	8
3.	a)	Define instrument transformer. Explain the measurement of current and voltage by moving iron instrument.	7
	b)	Differentiate between isolation versus Instrumentation Amplifier. Draw Instrumentation Amplifier circuit and derive its voltage gain.	8
4.	a)	Differentiate between amplification and attenuation. Design OP-Amps circuit to give output. $V_0=2V_1-3V_2+4V_3-5V_3$	7
	b)	Design successive approximation method that becomes capable to convert Analog Voltage 11.1 V into its equivalent digital voltage. Design part must include circuit diagram as well as successive tabular steps involved during transformation from ADC to DAC.	8
5.	a)	Define connectors. Explain types of probes used in measurement.	7
	b)	What is spectrum analyser? Explain its components for measurement of RF signals with necessary block diagram.	8

6. a) What is digital voltmeter? Explain ramp type digital voltmeter. 7

b) Explain construction, operation with application graphic recorders. 8

OR

Explain construction, operation of storage and sampling oscilloscopes.

7. Write short notes on: **(Any two)** 2×5

a) Wager's ground connection

b) Fiber optics

c) LED and seven segment display