Total number of printed pages:2 **UG/3rd/UIE304**

2021

FUNDAMENTAL OF INSTRUMENTATION

Full Marks: 100

Time: Three hours

The figures in the margin indicate full marks for the questions.

*Answer **any five** questions.*

1.	a)	What is Rise time?	2
	b)	Why linear system is preferable.	4
	c)	What are the systematic errors? Explain.	6
	d)	Draw a Op-amp based voltage to current converter. Explain the difference between voltage source and current source.	4+4
2.	a)	What is the input impedance of non-inverting operational amplifier?	2
	b)	Defined accuracy and precision.	4
	c)	What are the different methods of calibration in measurement?	6
	d)	Write a short note on Fundamental SI Units. Write the difference between unit and standard.	4+4
3.	a)	What is the significant of power factor?	2
	b)	Draw the Non-inverting amplifier circuit and find the output equation.	4
	c)	Explain with circuit diagram of Op-amp based voltage to current converter with grounded load.	6
	d)	Write a note on Calibration. Draw the diagram of Wattmeter calibration.	4+4

4.	a)	Why 4-20mA is use.	2
	b)	Draw the Differential amplifier circuit and derive the output equation.	4
	c)	Draw the Instrumentation amplifier circuit with output equation and advantages.	6
	d)	What are the application of null type and defection type Bridge? Write two diagrams of these applications.	4+4
5.	a)	Draw inverting amplifier?	2
	b)	Discuss the characteristics of an ideal operational amplifier.	4
	c)	What are the human errors? Explain.	6
	d)	Write a short note on Curve Fitting – Method of Least Squares.	8
6.	a)	How Voltmeter is calibrated?	2
	b)	Defined Hysteresis and Resolution.	4
	c)	Describe the different standards.	6
	d)	Draw the block diagram of weight measurement system. Explain all the functional blocks.	4+4