

2021

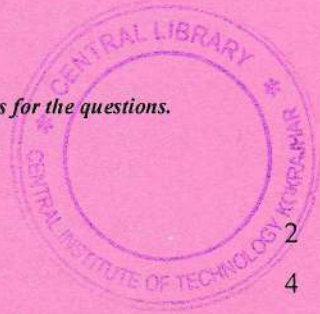
FUNDAMENTAL OF INSTRUMENTATION

Full Marks: 100

Time: Three hours

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

Answer any five questions.

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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. 4+4
Explain the difference between voltage source and current source.
 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

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| 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 deflection 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 |

