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**PRESIDENCY UNIVERSITY**

**Bengaluru**

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| **Ph.D. Course Work End Term Examinations – JAN-FEB 2025** |
| **Date:** 31- 01- 2025 **Time:** 09:30 am – 12:30 pm |

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| **School:** SOE | **Program:** Ph.D. | |
| **Course Code:** EEE821 | **Course Name:** Industrial Instrumentation | |
| **Semester**: | **Max Marks**:100 | **Weightage**:50% |

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| **CO - Levels** | **CO1** | **CO2** | **CO3** | **CO4** | **CO5** |
| **Marks** | **20** | **20** | **30** | **30** | **-** |

**Instructions:**

1. *Read all questions carefully and answer accordingly.*
2. *Do not write anything on the question paper other than roll number.*

**Part A**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Answer ALL the Questions. Each question carries 10 marks. 6Q x 10M=60Marks** | | | | |
| **1** | The magnitude and phase response of instruments are critical aspects of their behavior, particularly in the context of signal processing and control systems. Understanding these responses helps in analyzing how instruments react to different frequencies of input signals. Explain the concept of magnitude and phase response of instruments | **10 Marks** | **L3** | **CO1** |
| **2** | Classify instruments based on their operation and applications. Provide examples for each type. | **10 Marks** | **L4** | **CO1** |
| **3** | Suggest a temperature sensor that is to be used in industrial processes, HVAC systems etc which will generate a voltage when there is a temperature difference between two points. Explain its principle and working | **10 Marks** | **L3** | **CO2** |
| **4** | A manufacturing industry need a sensor for the remote monitoring of its plant temperature. The temperature has to be monitored continuously and is to be used for temperature control. Identify a sensor which is having a linear characteristic for this industry. With neat circuit diagram explain its working. | **10 Marks** | **L3** | **CO2** |
| **5** | List the design considerations for selecting a pressure sensor for moderate pressure applications | **10 Marks** | **L4** | **CO3** |
| **6** | Illustrate the working principle of an electromagnetic flowmeter. What are its advantages and limitations in flow measurement? | **10 Marks** | **L3** | **CO4** |

**Part B**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Answer the Questions. Each question carries 20 marks 2Q x 20 = 40 Marks** | | | | | |
| **7.** |  | Conduct a detailed analysis of the use of Knudsen gauges in ultra-high vacuum systems and how these gauges operate under different gas compositions and their impact on accuracy. | **20 Marks** | **L4** | **CO3** |
|  | | | | | |
| **8.** |  | Discover the construction, working principle, and applications of a variable reluctance tach generator. Inspect its role in speed measurement systems and compare it with other types of tach generators**.** | **20 Marks** | **L4** | **CO4** |

**\*\*\*\*\* BEST WISHES \*\*\*\*\***