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**PRESIDENCY UNIVERSITY**

**Bengaluru**

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| **End - Term Examinations – JANUARY 2025** |
| **Date:** 04 - 01- 2024 **Time:** 09:30 am – 12:30 pm |

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| **School:** School of Engineering | **Program**: B.Tech - MCM | |
| **Course Code :**MEC3067 | **Course Name :** Engineering Instruments and Measurement | |
| **Semester**: VII | **Max Marks**:100 | **Weightage**:50% |

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| **CO - Levels** | **CO1** | **CO2** | **CO3** | **CO4** | **CO5** |
| **Marks** | **17** | **21** | **31** | **31** | **0** |

**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 2marks. 10Q x 2M=20M** | | | | |
| **1** | What is the best way to eliminate parallax error? | **2 Marks** | **L1** | **CO1** |
| **2** | Define Systematic error with an example? | **2 Marks** | **L1** | **CO2** |
| **3** | When a series of repeated measurements that are made on a component under similar conditions are plotted, it follows……………………… distribution. | **2 Marks** | **L1** | **CO2** |
| **4** | Two full turns of the circular scale of a gauge cover a distance of 1 mm on the scale. The total number of divisions on circular scale is 50. Find least count. | **2 Marks** | **L1** | **CO2** |
| **5** | The least count of the main scale of a screw gauge is 1mm. Find the minimum number of division on its circular scale required to measure 5μm diameter of wire. | **2 Marks** | **L1** | **CO3** |
| **6** | A dead-weight pressure gauge works on…………….. | **2 Marks** | **L1** | **CO3** |
| **7** | The element that makes a microscope a measuring instrument is……………… | **2 Marks** | **L1** | **CO3** |
| **8** | Gauge pressure is measured………………………. | **2 Marks** | **L1** | **CO4** |
| **9** | A McLeod gauge is used to measure………………. | **2 Marks** | **L1** | **CO4** |
| **10** | In a Knudsen gauge, gas pressure is expressed in terms of………………. | **2 Marks** | **L1** | **CO4** |

**Part B**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Answer the Questions. Total Marks 80** | | | | | |
| **11.** | **a.** | i) Explain the various qualities a good transducer should possess.  ii) Discuss the working of a Bourdon gauge with a neat sketch. | **25 Marks** | **L3** | **CO4** |
| **or** | | | | | |
| **12.** | **a.** | i) Mention the advantage of electronic instruments over conventional instruments  ii) With the help of block diagram explain the elements of a generalized measurement system | **25 Marks** | **L3** | **CO4** |
|  |  |  |  |  |  |
| **13.** | **a.** | i) Write down the major types of errors of spur gear that are important from a metrological point of view.  ii) With the help of block diagram explain the working of optical pyrometer | **25 Marks** | **L3** | **CO3** |
| **or** | | | | | |
| **14.** | **a.** | i) Define the following: Accuracy, Precision, Calibration, Sensitivity and Hysteresis.  ii) List the elements of gears which are important for analytical inspection | **25 Marks** | **L3** | **CO3** |

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| **15.** | **a.** | With a neat diagram derive the balancing equation for kelvin’s double bridge | **15**  **Marks** | **L2** | **CO2** |
| **Or** | | | | | |
| **16.** | **a.** | Explain the measurement of inductance using Anderson’s Bridge with a neat diagram | **15 Marks** | **L2** | **CO2** |

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| **17.** | **a.** | An object was weighted by a physical balance and following reading were obtained 5.09 g, 5.15 g. 5.00 g, 4.90 g and 4.85 g.  Calculate; a) Absolute Error b) Mean Absolute Error c) Relative Error d) Percentage Error | **15**  **Marks** | **L2** | **CO1** |
| **Or** | | | | | |
| **18.** | **a.** | Given Expected voltage value across a resistor of 85 V. The measurement is 78 V. Calculate: i) The absolute error ii) The % percentage error iii) The relative accuracy iv) The percentage(%) of accuracy | **15**  **Marks** | **L2** | **CO1** |

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