Code No. : 12315 N

# VASAVI COLLEGE OF ENGINEERING *(AUTONOMOUS)*, HYDERABAD
*Accredited by NAAC with A++ Grade*
## B.E. (E.E.E) II-Semester Main & Backlog Examinations, September-2022
## Electrical Measurements and Instrumentation

Time: **3 hours**                                         Max. Marks: **60**

*Note: Answer all questions from **Part-A** and any **FIVE** from **Part-B***

### Part-A (10 × 2 = 20 Marks)

| Q. No. | Stem of the question | M | L | CO | PO |
|---|---|---|---|---|---|
| 1. | Discuss briefly accuracy of an instrument. | 2 | 1 | 1 | 1,3 |
| 2. | Give the classification of instruments. | 2 | 2 | 1 | 1,3 |
| 3. | Draw the circuit diagram of reactive power measurement by single wattmeter method. | 2 | 3 | 2 | 1,2 |
| 4. | List the advantages of digital instruments | 2 | 1 | 2 | 1,2 |
| 5. | Classify the resistance based on the value range. | 2 | 2 | 3 | 1,2 |
| 6. | Draw the schematic diagram of Wagner's earthing device. | 2 | 3 | 3 | 1,2 |
| 7. | Draw the circuit diagram for Ammeter calibration using potentiometer. | 2 | 3 | 4 | 1,2 |
| 8. | Discuss briefly turns ratio of Current Transformer and Potential Transformer. | 2 | 2 | 4 | 1,2 |
| 9. | List the types of transducers. | 2 | 1 | 5 | 1,2 |
| 10. | Draw the schematic diagram of bonded strain gauge. | 2 | 3 | 5 | 1,2 |

### Part-B (5 × 8 = 40 Marks)

| | | | | | |
|---|---|---|---|---|---|
| 11. a) | Describe the construction and working of Attraction type moving iron instrument. | 5 | 1 | 1 | 1,3 |
| b) | A 1mA meter with an internal resistance of $100\Omega$ is to be converted into a 0-100 mA ammeter, calculate the shunt required. | 3 | 3 | 1 | 1,3 |
| 12. a) | Explain the measurement of 3-phase power using two-wattmeter method. | 5 | 2 | 2 | 1,2 |
| b) | Draw the Lissajous pattern, when the two-input equal sinusoidal voltage signals of same frequency with phase difference $90^0$ are applied to CRO. | 3 | 3 | 2 | 1,2 |

| | | | M | L | CO | PO |
|---|---|---|---|---|---|---|
| 13. | a) | Prove that Kelvin's double bridge doesn't include connecting wire resistance in measurement. | 5 | 4 | 3 | 1,2 |
| | b) | Explain measurement of Capacitance by Desauty's bridge. | 3 | 2 | 3 | 1,2 |
| 14. | a) | Derive the expression for transformation ratio of a Current Transformer. | 5 | 3 | 4 | 1,2 |
| | b) | Explain the measurement of resistance by DC Crompton potentiometer. | 3 | 2 | 4 | 1,2 |
| 15. | a) | Explain the measurement of angular velocity using the DC Tachogenerator. | 5 | 2 | 5 | 1,2 |
| | b) | Explain the measurement of linear displacement using linear Potentiometer. | 3 | 2 | 5 | 1,2 |
| 16. | a) | Prove that the scale of instrument using gravity control is non-uniform. | 4 | 4 | 1 | 1,3 |
| | b) | Explain the measurement of 3 -- phase total reactive power using single wattmeter method. | 4 | 4 | 2 | 1,3 |
| 17. | | Answer any *two* of the following: | | | | |
| | a) | Deduce the balance equation of general form of an AC bridge. | 4 | 3 | 3 | 1,2 |
| | b) | Explain the construction of standard resistance with neat sketch. | 4 | 2 | 4 | 1,2 |
| | c) | Describe about the transducers and their classification. | 4 | 1 | 5 | 1,2 |

M : Marks;   L: Bloom's Taxonomy Level;   CO; Course Outcome;   PO: Programme Outcome

| i) | Blooms Taxonomy Level – 1 | 20% |
|---|---|---|
| ii) | Blooms Taxonomy Level – 2 | 40% |
| iii) | Blooms Taxonomy Level – 3 & 4 | 40% |

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