Reg.No. \_\_\_\_\_\_\_\_\_\_\_\_\_



**End Semester Examination – Nov / Dec – 2019**

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
| **Code :** | **14EI2003** | Duration : | **3hrs** |
| **Sub. Name :** | **ELECTRICAL MEASUREMENTS** | Max. marks : | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | Explain in detail about the dynamic characteristics of measurement system. | CO1 | 15 |
| b. | A 2mA meter with an internal resistance of 100 Ω is to be converted to 0 – 150 mA ammeter. Calculate the value of the shunt resistance required. | CO2 | 5 |
| (OR) | | | | |
| 2. | a. | Describe the working of galvanometer instrument with its torque equation. | CO1 | 12 |
| b. | Exemplify in detail about the generalized instrumentation system. | CO1 | 8 |
|  |  |  |  |  |
| 3. | a. | A basic d’arsonval movement with an internal resistance of 50 Ω and a full scale deflection current of 2 mA is to be used as a mutirange voltmeter. Design the series string of multipliers to obtain the voltage ranges of 0-10 V, 0-50V, 0-100V, and 0-500V. The arrangement is shown in the following diagram. | CO2 | 15 |
|  | b. | List the static characteristics of measurement system. | CO2 | 5 |
| (OR) | | | | |
| 4. | a. | Discuss in detail the different types of errors and the measures taken to minimize these errors. | CO1 | 12 |
|  | b. | A voltmeter having a sensitivity of 1 k Ω /V is connected across an unkown resistance in series with a milliammeter reading 80 V on 150 V scale. When the milliammeter reads 10mA, calculate the  (i) Apparent resistance of the unknown resistance, (ii) Actual resistance of the unknown resistance, (iii) Error due to the loading effect of the voltmeter. | CO2 | 8 |
|  |  |  |  |  |
| 5. | a. | Derive the equation for series and shunt type ohmmeter. | CO1 | 10 |
| b. | Mention the equation for torque for Moving Iron, Moving Coil and Electrodynamometer type instruments. | CO1 | 10 |
| (OR) | | | | |
| 6. | a. | Describe the working of Energy meter with its constructional diagram. | CO1 | 20 |
|  |  |  |  |  |
| 7. | a. | Describe how an unknown resistance is measured with the help of Wheatstone and Kelvin bridge. | CO3 | 10 |
|  | b. | Discuss the working of Desaughty’s bridge with the equations for AC Bridge balance. | CO3 | 10 |
| (OR) | | | | |
| 8. | a. | Describe the working principle of Wien’s bridge circuit. Give its advantages and disadvantages. | CO3 | 10 |
| b. | Discuss the working of Hay’s bridge for measurement of inductance. Derive the equations for balance. | CO3 | 10 |
|  | |  |  |  |
|  | | **Compulsory**: |  |  |
| 9. | a. | With suitable circuit diagram, explain the working of an XY recorder. Give its applications. | CO1 | 10 |
|  | b. | Explain in detail the Strip chart recorder. Explain the different types of marking mechanisms used in it. | CO1 | 10 |