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

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**End Semester Examination – Nov/Dec – 2018**

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

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

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| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | Discuss in detail the different types of systematic errors and the measures taken to minimize these errors. | CO1 | 10 |
| b. | Explain why is damping torque necessary in indicating instruments? Sketch the curves showing the different damping conditions. | CO3 | 10 |
| (OR) | | | | |
| 2. | a. | Describe the construction and working of PMMC instrument. Derive its torque equation. | CO3 | 10 |
| b. | Describe the construction and working of a Series Type Ohmmeter. Write down its design equations. | CO2 | 10 |
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| 3. | a. | A voltmeter having a sensitivity of 1 kΩ /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. | CO3 | 10 |
| b. | Discuss in detail about the different types of dynamic characteristics of measurement instrumentation system. | CO2 | 10 |
| (OR) | | | | |
| 4. | a. | Describe the working of Energy meter with its constructional diagram. | 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. | CO3 | 5 |
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| 5. | a. | Mention the equation of torque for Moving Iron, Moving Coil and Electrodynamometer type instruments. | CO2 | 5 |
| b. | The value of an unknown capacitor is to be measured using a Schering bridge. If the values of the bridge capacitors and resistors are as shown below, what is the value of the unknown capacitor, C x, and its series resistance, R x? Cs=1000 pf, C3= 10 pf, R3= 1 M Ω, R4= 1 kΩ | CO1 | 15 |
| (OR) | | | | |
| 6. | a. | Describe how an unknown inductance is measured with the help of Maxwell’s Inductance- Capacitance Bridge. Comment on its Q factor. Derive the bridge balance condition. | CO2 | 10 |
| b. | Draw and explain the working of Wheatstone bridge. Derive the condition for balance the bridge. | CO3 | 10 |
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| 7. | a. | Explain in detail with a neat circuit diagram on Current transformer. | CO4 | 10 |
| b. | Describe the working of Wien’s Bridge Circuit and derives the expression for the unknown element at balance. | CO1 | 10 |
| (OR) | | | | |
| 8. | a. | Sketch the circuit diagram of Anderson’s bridge. Derive the equations for resistive and inductive components of the inductor to be measured. | CO1 | 15 |
| b. | Write short note on magnetic recorder. | CO3 | 5 |
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|  | | **Compulsory:** |  |  |
| 9. | a. | Describe the functioning of a basic type of strip chart recorder. Explain the different types of marking mechanisms used in it. | CO2 | 10 |
| b. | With suitable circuit diagram, the working of an XY recorder. Give its applications. | CO2 | 10 |