Code :RR310202

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Time: 3 hours   Max Marks: 80

Answer any FIVE questions
All questions carry equal marks
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1. (a) Describe briefly the construction and principle of operation of a permanent magnet moving coil type of instrument and explain how this can be used as an ammeter and voltmeter. What are the errors involved?

    (b) A 50V moving iron voltmeter has a resistance of 400 Ω, made up of a copper coil of 40 Ω & 80mH in series with a non inductive resistance of 360Ω. Show, how to connect a capacitor so that the instrument will read correctly both on d.c as well as a.c. Also calculate the value of capacitance.

2. (a) Why electro static instruments cannot be used for measurement of low voltages while electromagnetic instruments can be? Illustrate your answer with some specific example comparing the energy densities produced in electrostatic instruments and electromagnetic instruments.

    (b) The movable range of a quadrant electrometer turns through 40 scale divisions when it is idiostatically connected to a potential of 100V. When it is used heterostatically with the quadrants connected to a small voltage "e"? and the needle to a 100v supply, the deflection is 15 scale divisions. Determine the voltage "e".

3. (a) Explain with the help of a neat circuit diagram, how the power & the power factor in a 3ϕ circuit can be measured by two wattmeter method. Explain how the readings of the two wattmeters change with load p.f?

    (b) A balanced load is supplied from a 3ϕ, 400V, 3 wire system whose power is measured by two wattmeters. If the total power supplied is 26 KW at 0.75 pf lagging, find the readings of each of the two wattmeters.

4. Write short notes on the following:

    (a) Watt hour meter

    (b) Ampere hour meter

    (c) Phantom loading

    (d) Maximum demand indicator

5. (a) Find the working current of the slide wire and the rheostat setting

    (b) If the slide wire has divisions marked in mm and each division can be interpolated to one fifth, calculate the resolution of the instrument.

    (c) What is standardization and explain with an example, how it is obtained.

6. (a) Describe the construction and working of a co-ordinate type a.c. potentiometer. How is it standard? Explain how an unknown voltage can be measured with it.

    (b) Discuss the source of errors with respect to a.c potentiometers.

7. (a) Derive the equations for balance in the case of Maxwells inductance bridge for the measurement of self Inductance

    (b) Arm ab consists of a coil with inductance L_1 and resistance r_1 in series with a non inductive resistance R. Arm bc and ad are each a non-inductive resistance of 100Ω. Arm ad consists of standard variable inductor L of resistance 32.7Ω. Balance is obtained when L_2=47.8mH and r=1.36Ω. Find the resistance and inductance of the coil in arm ab.

8. Describe how magnetizing and loss components of no load current of a transformer be determined by using an ac potentiometer.

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