SCHEME – E

Sample Question Papers

Course Name : Electrical Engineering Group

Course Code : EE/EP

Semester : Third

Subject Title : Electrical Measurements

12056

Max Marks : 100 **Times: 3 Hours**

Instructions:

1) All questions are compulsory.
2) Illustrate your answers with neat sketches wherever necessary.
3) Figures to the right indicate full marks.
4) Assume suitable data if necessary.
5) Preferably, write the answers in sequential order.

Q.1 - Attempt *any TEN of the following:* **20 Marks**

a) Define accuracy and precision.

b) Distinguish between absolute and secondary instrument.

c) List the different types of errors occurring while measurement.

d) List the methods of providing controlling torque in indicating instrument.

e) State the working principle of dynamometer type wattmeter.

f) Define multiplying factor of wattmeter.

g) State the meaning of creeping .how it is prevented in energy meter?

h) Why synchronoscope is needed?

i) Which type of indication is provided by phase sequence indicator?

j) Which method is used to determine insulation resistance?

k) State the two advantages of Kelvin Bridge over Wheatstone bridge.

l) Classify different types of A.C. bridges.

Q.2 - Attempt *any FOUR of the following:* **16 Marks**

a) Classify the secondary instruments giving one example for each type.

b) State any four desirable qualities of electrical measuring instruments.

c) Why moving iron instruments having non uniform scales?

d) Mention the precautions to be taken while connecting C.T. and P.T. In circuits.

e) Draw a neat sketch and label the parts of P.M.M.C. type ammeters.

f) A moving coil instrument gives a full scale deflection with 10 mA and has a resistance of 50 Ω. Calculate the resistance necessary to be put in series / parallel with the instrument in order that it may be used as – (i) 0 - 5 A ammeter, (ii) 0 – 200 V voltmeter.

Q.3 - Attempt *any FOUR of the following:* **16 Marks**

a) State advantages and disadvantages of moving iron instruments.

b) A PMMC meter of 0 – 250 V range is connected across single phase 230 V, 50 Hz supply. State with reasons, what will be reading on the meter?.

c) A moving coil instrument used as voltmeter has a coil of 150 turns with a width of 3 cm & active length of 3 cm. The air gap flux density of 0.15 Tesla. If the full scale reading is 150 V and the total resistance of the instrument is 1 x 10^5 Ω. Find the torque exerted by control springs at full scale.

d) Mention the four types of errors occurring in dynamometer type wattmeter.

e) Draw neat circuit diagram & phasor diagram for measurement of power by two wattmeter method in three phase star connected load and derive the relation of two wattmeter readings.

f) Draw a neat sketch and label the parts of dynamometer type wattmeter.

Q.4 - Attempt *any FOUR of the following:* **16 Marks**

a) A single phase wattmeter rated for 500 V, 10 A is having full scale deflection of 1250 watt; what is the multiplying factor of the wattmeter?

b) Draw labeled block diagram of digital wattmeter.

c) Define balanced load in three phase circuit. Is the load shown in the diagram balanced? State with reason.

d) Explain with neat sketch the working principle of single phase energy meter.

e) Draw a block diagram of electronic energy meter.

f) When energy meter is running fast? How will you adjust the speed?

Q.5 - Attempt *any FOUR of the following:* **16 Marks**

a) A single phase energy meter has a constant of 6000 Rev / kWh.
A test was carried out with resistive load for one minute during Which the meter made 21 Rev. The voltage was 110 V & Current 2 A; calculate percentage error.

b) Draw the neat sketch and label the parts of three element type, three phase four wire energy meter.

c) Explain the working of phase sequence indicator.

d) State the working principle of Weston frequency meter.

e) Draw a neat sketch and give the working principle of single phase power factor meter.

f) Explain with neat sketch working principle of Q meter.

Q.6 - Attempt *any FOUR of the following:* **16 Marks**

a) Draw a neat sketch and name the different parts of synchronoscope.

b) How resistances are classified according to values.Give two examples of each.

c) State principle of wheatstone bridge and derive formula for its balance condition.

d) How do you measure earth resistance by earth tester?

e) List the quantities measured by digital multimeter.

f) Explain the concept of L.C.R.meter.