

Electrical and Electronic Measurement (313334)

MSBTE Diploma · K-Scheme · Electrical Engineering (EE) · Sem III · Model Question Paper — Set C

Time: 3 Hours**Max. Marks: 70****Instructions:**

1. All questions are compulsory.
2. Answer each next main question on a new page.
3. Illustrate your answers with neat sketches wherever necessary.
4. Figures to the right indicate full marks.
5. Assume suitable data, if necessary.
6. Use of non-programmable electronic pocket calculator is permissible.
7. Mobile phone, pager and any other electronic communication devices are not permissible in the examination hall.

Q.1 Attempt any FIVE of the following:**10**

- a) Define measurement. State the two methods of measurement.
- b) Define: i) Dead zone ii) Static error.
- c) State the function of deflecting torque and damping torque.
- d) Write any two applications each of function generator and CRO.
- e) State any two differences between sensor and transducer.
- f) State the classification of level measurement transducers.
- g) Classify flow meters with one example of each type.

Q.2 Attempt any THREE of the following:**12**

- a) Explain the use of CT and PT for range extension of AC ammeter and voltmeter with connection diagrams.
- b) Draw the block diagram of three phase digital energy meter and explain its working.
- c) With a neat block diagram explain the working of CRO. Why is a delay line used in the vertical section?
- d) Describe the piezoelectric transducer. State its classification with examples.

Q.3 Attempt any THREE of the following:**12**

- a) Classify resistances on the basis of their value and name the method of measurement of each. In a Wheatstone bridge, $P = 1000\ \Omega$, $Q = 100\ \Omega$ and the bridge balances when $S = 436\ \Omega$. Find the unknown resistance R ($P/Q = R/S$).
- b) Explain the working of smart energy meter with block diagram. State any four advantages.

- c) Describe the procedure for measurement of earth resistance of an earth electrode by digital earth tester.
- d) Explain the construction and working of capacitive level measurement. Write the expression for capacitance.

Q.4 Attempt any THREE of the following:

12

- a) Write any four points of difference between analog and digital instruments.
- b) A dynamometer wattmeter has current coil range of 10 A and pressure coil range of 300 V. Its scale has 150 divisions with full scale reading of 750 W. Find (i) multiplying factor (ii) actual power when the pointer reads 96 divisions.
- c) Identify the instrument used to check whether an incoming alternator is in synchronism with the bus-bars and explain its working in brief.
- d) Describe the use of LVDT for displacement measurement. Draw its output characteristic.
- e) Explain radiation type level measurement with a labelled diagram.

Q.5 Attempt any TWO of the following:

12

- a) Draw the connection diagram of two wattmeter method for a balanced 3-phase delta connected load. Explain the effect of power factor on the wattmeter readings. If the readings are 5 kW and –1 kW, find the total power and power factor.
- b) Draw the basic block diagram of digital storage oscilloscope (DSO) and explain the function of each block.
- c) Define pressure and state the types of pressure. Explain Bourdon tube with LVDT as secondary transducer.

Q.6 Attempt any TWO of the following:

12

- a) Explain one wattmeter method for measurement of reactive power of a balanced 3-phase delta connected load with circuit and phasor diagram. A balanced load takes 10 A line current at 400 V line voltage and 0.6 pf lagging; find the wattmeter reading and total reactive power.
- b) Explain the construction and working of electromagnetic flow meter. Why can it not be used for petroleum products?
- c) Write any three units of temperature. Explain RTD with a labelled diagram. A Pt-100 RTD has $\alpha = 0.00385 / ^\circ\text{C}$; find its resistance at 100 $^\circ\text{C}$ and the temperature when its resistance is 119.25 Ω .

Note: This is a **model question paper prepared by Ananda Technologies** only for practice and exam preparation, based on the pattern of previous MSBTE question papers and the K-scheme syllabus. It is **not an official MSBTE paper**, and it does **not** mean that these questions will come in the exam. Answers follow standard textbook points; marks shown are indicative. Free for students — anandatechnologies.in