

Electrical and Electronic Measurement (313334)

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

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) State the importance of measurement in electrical engineering.
- b) Define: i) Precision ii) Resolution.
- c) Define multiplying factor of a wattmeter. A wattmeter has current coil of 10 A, pressure coil of 600 V and a dial of full scale 1500 W. Find its multiplying factor.
- d) State any two differences between analog and digital instruments.
- e) Define transducer. Give two examples each of active and passive transducers.
- f) State the meaning of four quadrants in a four quadrant energy meter.
- g) State any four advantages of RTD.

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

- a) State the need of controlling torque. Explain spring control method with a neat sketch.
- b) Explain construction and working of dynamometer type wattmeter with a labelled diagram.
- c) Describe the procedure for measurement of earth resistance using digital earth tester.
- d) Explain the working of piezoelectric transducer. State its classification with examples.

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

- a) Explain the construction and working of moving iron instruments (attraction and repulsion type).
- b) Draw the block diagram of smart energy meter. State any four features of smart energy meter.

- c) With a neat block diagram explain the vertical and horizontal deflection systems of CRO.
- d) Classify level measurement methods. Explain ultrasonic level measurement with a sketch.

Q.4 Attempt any THREE of the following:

12

- a) State different types of errors in measurement and suggest methods to minimise them.
- b) A balanced star connected inductive load takes 15 A per phase at a phase voltage of 230 V and power factor 0.8 lagging. The power is measured by two wattmeter method in a 3-wire system. Find the readings of the two wattmeters.
- c) An energy meter has a meter constant of 1200 rev/kWh. During a test at 230 V, 12 A, unity power factor, the disc makes 560 revolutions in 10 minutes. Calculate the percentage error. State whether the meter runs fast or slow.
- d) Draw and explain the Weston type frequency meter.
- e) Describe capacitive level measurement for conducting and non-conducting liquids.

Q.5 Attempt any TWO of the following:

12

- a) Identify the instrument used for synchronisation of alternators. Explain its construction and working. State the conditions for synchronisation.
- b) Explain LVDT with its output characteristic. Compare LVDT and RVDT (any two points).
- c) Classify flow measuring devices. Explain the working principle of electromagnetic flow meter and state its applications.

Q.6 Attempt any TWO of the following:

12

- a) Draw the block diagram of function generator. Explain how square, triangular and sine waves are generated in it.
- b) Describe the working of Bourdon tube with LVDT as secondary transducer for pressure measurement with a neat sketch.
- c) Explain the measurement of temperature with thermocouple. Name the materials used in J, K, R and S type thermocouples.

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