Electrical and Electronic Measurement (313334)

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

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 its significance.

b) Define: i) Accuracy ii) Sensitivity.

c) A wattmeter rated for 250 V, 5 A has a dial with full scale reading of 500 W. Calculate its multiplying factor. Find the actual power when the pointer shows 160 W.

d) State any four advantages of digital measuring instruments.

e) Define sensor and transducer. Give one example of each.

f) Classify the level measurement methods.

g) Define temperature. State any two units of temperature.

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

a) Explain deflecting, controlling and damping torques required in indicating instruments.

b) Draw the block diagram of smart energy meter and explain its working.

c) Draw the basic block diagram of CRO and state the function of each block.

d) Describe the construction and working of LVDT with a neat labelled diagram.

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

a) Explain the construction and working of PMMC instrument with a neat sketch.

b) Explain the two wattmeter method of measurement of power in a 3-phase balanced star connected load with connection diagram and phasor diagram.

c) Explain the working of digital earth tester with a neat diagram.

d) Explain capacitive type level measurement with a neat sketch.

Q.4 Attempt any THREE of the following: **12**

a) A PMMC instrument has coil resistance of 5 Ω and gives full scale deflection at 15 mA. Calculate the value of resistance required to convert it into (i) an ammeter of range 0–10 A (ii) a voltmeter of range 0–150 V. Draw the circuit for each.

b) Explain the construction and working of maximum demand indicator (Merz-Price type).

c) Two wattmeters connected to measure the input power of a 3-phase balanced load read 4.8 kW and 1.6 kW. Calculate total power and power factor of the load. Also find total power and power factor if the second reading was obtained after reversing the current coil connection.

d) Explain with a neat diagram the construction and working of electrodynamometer type synchroscope.

e) Explain the working of piezoelectric transducer with a neat diagram. State two applications.

Q.5 Attempt any TWO of the following: **12**

a) Draw the block diagram of function generator. Explain the function of each block and state its applications.

b) Explain the measurement of pressure using Bourdon tube with LVDT as secondary transducer, with a neat labelled diagram.

c) State the classification of flow meters. Explain the electromagnetic flow meter with a neat diagram.

Q.6 Attempt any TWO of the following: **12**

a) Explain the construction and working of single phase induction type energy meter with a neat labelled diagram.

b) Define instrumentation system. Draw its block diagram and explain the function of each block.

c) Explain Resistance Temperature Detector (RTD) with a neat diagram. State its advantages and applications.

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