Total No. of Questions: 6 *Total No. of Printed Pages:3*

Enrollment No.....

Faculty of Engineering

End Sem Examination May-2024

EE3CO54 Measurements & Instrumentation

Programme: B.Tech. Branch/Specialisation: EE

Duration: 3 Hrs. **Maximum Marks: 60**

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d. Assume suitable data if necessary. Notations and symbols have their usual meaning.

Q.1 i. What is moving coil galvanometer used for? **1**

(a) Measure the current
(b) Measure the voltage
(c) Measure the resistance
(d) Measure the electric field

ii. In a measurement, what is the term used to specify the closeness of two or more measurements? **1**

(a) Precision (b) Accuracy
(c) Fidelity (d) Threshold

iii. The windings of a C.T. are _____. **1**

(a) Tied together (b) Shorted
(c) Wound over one another (d) Grounded

iv. A PT is a device which is _____. **1**

(a) Electrostatically coupled
(b) Electrically coupled
(c) Electromagnetically coupled
(d) Conductively coupled

v. When the moving coil in a dynamometer type wattmeter deflects _____. **1**

(a) Pointer doesn't move (b) Current flows
(c) Voltage is generated (d) Pointer moves

vi. Which of the following device is used to measure power in A.C. circuits? **1**

(a) Ammeter (b) Wattmeter
(c) Voltmeter (d) Ohmmeter

P.T.O.

vii. A Schering bridge can be used for the _____. **1**
(a) Protecting the circuit from temperature rises
(b) Measuring capacitance
(c) Measuring voltages
(d) Measuring currents

viii. Which of the following can be measured using Maxwell's inductance capacitance bridge? **1**
(a) Capacitance (b) Frequency
(c) Mutual Inductance (d) Inductance

ix. Thermocouple is a _____. **1**
(a) Primary device (b) Secondary transducer
(c) Tertiary transducer (d) None of these

x. Which of the following element is used as a thermocouple in nuclear reactor? **1**
(a) Boron (b) Platinum (c) Copper (d) Iron

Q.2 i. Define the following terms in measurement- **4**
(a) Accuracy (b) Resolution

ii. Explain the construction and principle of operation of permanent magnet moving coil instrument. **6**

OR iii. Derive an expression for deflecting torque and controlling torque **6**

Q.3 Attempt any two:

i. What is the general principle of operation of AC potentiometer? What are its types? **5**

ii. Discuss the methods for measuring high AC voltages. **5**

iii. Draw the equivalent circuit and phasor diagram of a current transformer. **5**

Q.4 i. Explain about measurement of reactive power by single wattmeter method. **4**

ii. Describe the construction detail and working of single-phase induction type energy meter. **6**

OR iii. Explain any two errors that occur in electrodynamometer type wattmeter and its compensation. **6**

Q.5 Attempt any two:

i. What is Maxwell's bridge? Derive the equation of balance for the bridge. **5**

ii. Explain why Kelvin's double bridge is superior to Wheatstone bridge for the purpose of low resistance measurement. **5**

iii. What is Schering bridge? Develop the equation of balance for the bridge. **5**

Q.6 Attempt any two:

i. Write short notes on thermistor. **5**

ii. Explain the basic principle and working of LVDT. **5**

iii. Discuss the working of a piezoelectric transducer in detail. **5**

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Marking Scheme

EE3CO54 (T) Measurements & Instrumentation

Q.1	i)	A	**1**
	ii)	A	**1**
	iii)	C	**1**
	iv)	C	**1**
	v)	D	**1**
	vi)	C	**1**
	vii)	B	**1**
	viii)	D	**1**
	ix)	D	**1**
	x)	A	**1**
Q.2	i.	Each 2Marks	**4**
	ii.	Construction 3 Marks, Principle 3 Marks	**6**
OR	iii.	Deflecting torque 3 Marks, Controlling 3 Marks	**6**
Q.3	i.	Principle operation 3 Marks , Types 2 Marks	**5**
	ii.	Circuit Diagram 2.5 Marks, Explanation 2.5 Marks	**5**
OR	iii.	Equation Circuit Diagram 2.5 Marks, Phasor Diagram 2.5 Marks	**5**
Q.4	i.	Circuit Diagram, Phasor Diagram, Expression (2, 1, 1 Marks)	**4**
	ii.	Construction (3 Marks) Working (3 Marks)	**6**
OR	iii.	Each error (3 Marks) and Compensation (3 Marks)	**6**
Q.5	i.	Circuit Diagram (2.5 Marks), Equation (2.5 Marks)	**5**
	ii.	Explanation (3 Marks), derivation (2 Marks)	**5**
OR	iii.	Circuit Diagram (2.5 Marks), Equation (2.5 Marks)	**5**
Q.6	i.	Diagram (2.5 Marks), Explanation (2.5 Marks)	**5**
	ii.	Diagram (2.5 Marks), Principle of Working (2.5 Marks)	**5**
	iii.	Diagram (2.5 Marks), Working (2j.5 Marks)	**5**

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