

CBCS SCHEME

BEE306B

USN

Third Semester B.E./B.Tech. Degree Examination, Dec.2023/Jan.2024 Electrical Measurements and Instrumentation

Time: 3 hrs.

Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course outcomes.

Module – 1			M	L	C
Q.1	a.	Define measurement. Mention the significance of measurement.	6	L1	CO4
	b.	Explain the methods of measurement. Also describe the applications of measurement systems.	6	L2	CO3
	c.	Explain the elements of a generalized measurement system along with the example.	8	L3	CO4
OR					
Q.2	a.	Define the following terms: (i) Accuracy (ii) Precision	4	L1	CO3
	b.	Write short notes on gross errors and systematic errors as referred to measurement systems.	8	L2	CO4
	c.	Explain the different methods of correction for interfering and modifying inputs with their applications.	8	L2	CO4
Module – 2					
Q.3	a.	Explain the fall of potential method for measuring earth resistance.	4	L1	CO2
	b.	With a neat sketch, explain Kelvin's double bridge and obtain a balance equation to measure low resistance.	8	L2	CO4
	c.	Derive an expression for Galvanometer current of unbalanced Wheatstone's bridge.	8	L3	CO4
OR					
Q.4	a.	Draw the diagram of Maxwell's inductance and capacitance bridge and obtain the equations.	8	L3	CO3
	b.	Obtain the balance equation for Hay's bridge used for measurement of low inductance.	8	L2	CO3
	c.	Write a short note on shielding of bridges.	4	L2	CO2
Module – 3					
Q.5	a.	With the help of a neat circuit diagram, explain how flux density can be measured in a ring specimen.	8	L3	CO3
	b.	Discuss the advantages of instrument transformers.	6	L1	CO4
	c.	Explain turns compensation used in instrument transformers.	6	L2	CO3
OR					
Q.6	a.	The exciting current of a ring core current transformer of ratio 1000/5A. When operating at full primary current and with a secondary burden of non-inductive resistance of 1Ω is 1A at a power factor of 0.4. Calculate: (i) The phase displacement between primary and secondary winding currents (ii) Ratio error at full load, assuming there has been no compensation.	6	L3	CO3

	b.	Explain the measurement of magnetizing force by ballistic galvanometer and a search coil.	8	L2	CO3
	c.	Write a short note on the characteristics of potential transformers.	6	L1	CO3
Module – 4					
Q.7	a.	Draw the block diagram of an electronic energy meter and explain its working. List its advantages and disadvantages.	12	L2	CO6
	b.	Explain the construction and working of True RMS reading voltmeter.	8	L2	CO3
OR					
Q.8	a.	With a neat sketch, explain the working of Q-meter.	6	L3	CO2
	b.	Write notes on the performance parameters of digital voltmeter.	6	L2	CO3
	c.	Explain the construction and working of successive approximation type DVMs.	8	L1	CO4
Module – 5					
Q.9	a.	Write a neat sketch, explain the working of LCD and list its advantages.	8	L2	CO3
	b.	Explain the working of Cathode Ray Tube (CRT) with neat diagram.	8	L2	CO4
	c.	What are Bar graph displays and where it is used?	4	L1	CO2
OR					
Q.10	a.	List the different types of recorders and explain XY recorders with neat diagram.	10	L2	CO5
	b.	Explain the following: (i) Nixie tubes (ii) ECG	10	L3	CO4

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