



VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN
 [AUTONOMOUS INSTITUTION AFFILIATED TO ANNA UNIVERSITY, CHENNAI]
 Elayampalayam – 637 205, Tiruchengode, Namakkal Dt., Tamil Nadu.

Question Paper Code: 80011

B.E. / B.Tech. DEGREE END-SEMESTER EXAMINATIONS - NOV. / DEC. 2024

Third Semester

Electrical and Electronics Engineering

U19EE306 – MEASUREMENTS AND INSTRUMENTATION

(Regulation 2019)

Time: Three Hours

Maximum: 100 Marks

Answer ALL the questions

Knowledge Levels (KL)	K1 – Remembering	K3 – Applying	K5 - Evaluating
	K2 – Understanding	K4 – Analyzing	K6 - Creating

PART – A

(10 x 2 = 20 Marks)

Q.No.	Questions	Marks	KL	CO
1.	Mention the essentials torque required for successful operation of instruments.	2	K1	CO1
2.	How controlling torque is produced?	2	K2	CO1
3.	Name the methods used for power measurement in three phase circuits.	2	K1	CO2
4.	List the possible cause of errors in moving iron instruments.	2	K2	CO2
5.	What are the types of Digital voltmeter?	2	K1	CO3
6.	Write the application of power quality analyzer.	2	K1	CO3
7.	State the advantages of Kelvin double bridge method.	2	K1	CO4
8.	Define optical pyrometer.	2	K1	CO4
9.	List the application of thermistor.	2	K1	CO5
10.	Write the principle of operation of capacitive transducer.	2	K1	CO5

PART – B

(5 x 13 = 65 Marks)

Q.No.	Questions	Marks	KL	CO
11. a)	Illustrate the static and dynamic characteristics of a measurement system.	13	K2	CO1
	(OR)			
b)	Draw the block diagram showing the basic functional elements of an instrument and explain the functions of each.	13	K2	CO1
12. a)	Explicate the construction and operation of attraction type moving iron instruments.	13	K2	CO2
	(OR)			
b)	Explicate the construction and operation of single phase induction type energy meter.	13	K2	CO2
13. a)	Elucidate the working of a Digital Storage Oscilloscope with a schematic block diagram.	13	K2	CO3
	(OR)			
b)	Elucidate the construction and working principle of Power quality analyzer.	13	K2	CO3
14. a)	Derive the bridge balance condition for the Wheatstone bridge.	13	K3	CO4
	(OR)			
b)	Derive the bridge balance condition for the Schering bridge.	13	K3	CO4
15. a)	Elucidate about the working of Linear Variable Differential Transformer (LVDT).	13	K2	CO5
	(OR)			
b)	Explicate about the Peizo-Electric transducers.	13	K2	CO5

PART – C

(1 x 15 = 15Marks)

Q.No.	Questions	Marks	KL	CO
16. a)	The coil of a 600V M.I meter has an inductance of 1 Henery. It gives correct reading at 50HZ and requires 100mA. For its full scale deflection, what is % error in the meter when connected to 200V D.C. by comparing with 200V A.C?	15	K3	CO1
	(OR)			
b)	In a low- Voltage Schering bridge designed for the measurement of permittivity, the branch 'ab' consists of two electrodes between which the specimen under test may be inserted, arm 'bc' is a non-reactive resistor R3 in parallel with a standard capacitor C3, arm CD is a non-reactive resistor R4 in parallel with a standard capacitor C4, arm 'da' is a standard air capacitor of capacitance C2. Without the specimen between the electrode, balance is obtained with following values, C3=C4=120 pF, C2=150 pF, R3=R4=5000Ω. With the specimen inserted, these values become C3=200 pF, C4=1000 pF, C2=900 pF and R3=R4=5000Ω. In such test $\omega=5000$ rad/sec. Find the relative permittivity of the specimen.	15	K3	CO4