Course Code: 19EC0416 **R19**

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
Siddharth Nagar, Narayanavanam Road – 517583

QUESTION BANK (DESCRIPTIVE)

Subject with Code: EMI (19EC0416) **Course & Branch**: B. Tech – ECE

Year &Sem: III-B. Tech & I-Sem **Regulation:** R19

UNIT –I
PERFROMANCE CHARACTERISTICS OF AN INSTRUMENT

1	a)	Explain about static characteristics of measuring instrument.	**[L2] [CO1]**	**[6M]**
	b)	Define the terms in dynamic characteristics i) Speed of Response ii) Fidelity iii) Lag.	**[L1] [CO1]**	**[6M]**
2	a)	Explain and Derive the Series Type Ohmmeter.	**[L3] [CO1]**	**[6M]**
	b)	A shunt type ohmmeter uses a5 mA basis D'Arsonval movement with an internal resistance of 50Ω. The battery voltage is 3V. It is desired to modify the circuits by adding appropriate shunt resistance Across the movement.so that the instrument indicates 5Ω at the midpoint scale. Calculate: i) The value of shunt resistance. ii) Value of current limiting resistance R1	**[L3] [CO1]**	**[6M]**
3	a)	Explain the fundamental principle of AC voltmeter	**[L2] [CO1]**	**[6M]**
	b)	With neat sketch explain thermocouple type RF ammeter.	**[L2] [CO1]**	**[6M]**
4	a)	Explain different types of errors that occur in measurements.	**[L2] [CO1]**	**[6M]**
	b)	Explain about Differential type voltmeter..	**[L2] [CO1]**	**[6M]**
5	a)	Define sensitivity. Calculate the sensitivity of a 100 μA meter movement which is to be used as a dc voltmeter	**[L3] [CO1]**	**[6M]**
	b)	Draw and explain solid state DC Voltmeter.	**[L2] [CO1]**	**[6M]**
6	a)	Explain the construction of multi-range voltmeter & Range extension DC Voltmeter.	**[L2] [CO1]**	**[6M]**
	b)	A D'Arsonval movement with a full-scale deflection current of 50 μA and internal resistance of 500Ω is to be converted into a multirange voltmeter. Define the value of multiplier required For 0-20V, 0-50V, 0-100V.	**[L3] [CO1]**	**[6M]**
7	a)	List the different dynamic characteristics of an instrument?	**[L1] [CO1]**	**[6M]**
	b)	Discuss about basic DC Ammeters.	**[L2] [CO1]**	**[6M]**
8	a)	Explain how a multi-meter can be used as i) DC voltmeter & AC volt meter. ii) DC ammeter & ohmmeter.	**[L2] [CO2]**	**[6M]**
	b)	Explain the process of Calibration	**[L2][CO2]**	**[6M]**
9	a)	With neat sketch, Explain about the Multirange Voltmeter.	**[L2] [CO1]**	**[6M]**
	b)	Describe about multirange AC voltmeter.	**[L2] [CO1]**	**[6M]**
10	a)	Discuss with the help of circuit diagram the construction & working of a Series type ohm meter.	**[L2] [CO1]**	**[6M]**
	b)	An Ammeter reads 8.3A and the true value of the current is 8.5A Determine The absolute error and Relative Percentage Error?	**[L3] [CO1]**	**[6M]**

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UNIT –II
OSCILLOSCOPES

1	a)	Discuss about important features of CRT.	**[L2] [CO2]**	**[6M]**
	b)	Draw the block diagram of a dual beam oscilloscope & explain its working.	**[L2] [CO2]**	**[6M]**
2		Draw the block diagram of a general-purpose oscilloscope (CRO) and explain function of each block.	**[L2] [CO2]**	**[12M]**
3	a)	With the help of block diagram explain Delay line.	**[L2] [CO2]**	**[6M]**
	b)	With neat sketch explain about vertical amplifier	**[L1] [CO2]**	**[6M]**
4	a)	What are the different types of CRO probes?	**[L1] [CO2]**	**[6M]**
	b)	Explain with the help of block diagram, how the digital frequency and time period can be measured using counter/meter instrument .	**[L2] [CO2]**	**[6M]**
5	a)	Briefly discuss about dual trace CRO.	**[L2] [CO2]**	**[6M]**
	b)	How the frequency can be measured using a Lissajous method. Explain with diagrams.	**[L2] [CO2]**	**[6M]**
6	a)	Construct delayed line sweep circuit, explain the operation.	**[L3] [CO2]**	**[6M]**
	b)	Describe in details the construction and working of a digital storage oscilloscope.	**[L2] [CO2]**	**[6M]**
7	a)	Discuss in detail, the construction and working of a Trigger sweep generator.	**[L2] [CO2]**	**[6M]**
	b)	Explain with a diagram how phase can be measured using a Lissajous method.	**[L2] [CO2]**	**[6M]**
8		Draw the block diagram of a dual beam CRO, explain its operation	**[L2] [CO2]**	**[12M]**
9	a)	State the various applications of an oscilloscope.	**[L1] [CO2]**	**[6M]**
	b)	Explain the function of trigger circuit.	**[L2] [CO2]**	**[6M]**
10	a)	Draw the neat diagrams of horizontal deflection systems and explain briefly about their working	**[L2] [CO3]**	**[6M]**
	b)	With neat sketch explain about horizontal amplifier.	**[L3] [CO2]**	**[6M]**

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UNIT –III
SIGNAL GENERATORS

1	a)	With a neat sketch explain the operation of arbitrary waveform generator.	**[L2] [CO3]**	**[6M]**
	b)	What are the different specifications of arbitrary waveform generator?	**[L2] [CO3]**	**[6M]**
2	a)	Describe the diagram with operation of a harmonic distortion analyzer using Wein Bridge and frequency selective type.	**[L2] [CO3]**	**[6M]**
	b)	What is the function of harmonic distortion analyzer?	**[L2] [CO3]**	**[6M]**
3	a)	Explain the working of a standard sweep generator with diagram.	**[L1] [CO3]**	**[6M]**
	b)	What is sweep generator? Explain in detail.	**[L1] [CO3]**	**[6M]**
4	a)	Draw the block diagram of a function generator and explain its operation.	**[L2] [CO3]**	**[6M]**
	b)	List the applications of random noise generator.	**[L1] [CO3]**	**[6M]**
5	a)	With the help of block diagram explain the functioning of a conventional standard signal generator.	**[L2] [CO3]**	**[6M]**
	b)	Write about fixed AF oscillator and variable AF oscillator.	**[L2] [CO3]**	**[6M]**
6		With a neat diagram discuss the operation of a pulse generator.	**[L3] [CO3]**	**[12M]**
7	a)	Discuss in detail about pulse generator.	**[L2] [CO3]**	**[6M]**
	b)	Explain the method of generate random noise.	**[L2] [CO3]**	**[6M]**
8	a)	With help of a neat sketch, explain the working of any one of wave analyzer	**[L3] [CO3]**	**[6M]**
	b)	What is the function of wave analyzer?	**[L1] [CO3]**	**[6M]**
9	a)	Describe with diagram the operation of a Logic analyzer.	**[L2] [CO3]**	**[7M]**
	b)	List the application of wave analyzers.	**[L1] [CO3]**	**[5M]**
10	a)	Draw the circuit diagram and explain the working of a spectrum analyzer.	**[L2] [CO3]**	**[6M]**
	b)	What is distortion? What does a distortion analyzer measure?	**[L1] [CO3]**	**[6M]**

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UNIT –IV
BRIDGES

1	a)	Discuss the working principle of q-meter &its applications.	**[L2] [CO4]**	**[6M]**
	b)	Write short note on interference &explain noise reduction techniques.	**[L2] [CO4]**	**[6M]**
2		Explain any Two ac bridges to measure unknown Inductance.	**[L3] [CO4]**	**[12M]**
3	a)	Compute the expression for Schering bridge circuit & write its applications.	**[L3] [CO4]**	**[6M]**
	b)	An A.C bridge as the following constants Arm AB-capacitor of 0.1µF in parallel with 2KΩ resistor, Arm AD-resistance of 5KΩ, Arm BC capacitor of 0.25 µF, Arm CD-unknown capacitor CX and RX in series f-2KHz.Determine the unknown capacitance.	**[L3] [CO4]**	**[6M]**
4	a)	How the Maxwell Bridge can be used for measuring an unknown inductance? Explain briefly.	**[L2] [CO4]**	**[6M]**
	b)	Define the interference & Explain about the noise reduction techniques.	**[L1] [CO4]**	**[6M]**
5		What is the function of bridge? With neat circuit, derive & explain Anderson's bridge.	**[L2] [CO4]**	**[12M]**
6	a)	What are the applications of Wheatstone bridge? List out its limitations.	**[L4] [CO4]**	**[6M]**
	b)	Describe the operation of the Wheatstone bridge and derive the expression for DC resistance.	**[L2] [CO4]**	**[6M]**
7	a)	Derive an expression for Wein Bridge.	**[L2] [CO4]**	**[6M]**
	b)	A Maxwell bridge is used to measure an inductive impedance the bridge constants at balance are C1=0.01 µF, R1=470KΩ, R2=5.1KΩ and R3=100 KΩ. Find the series equivalent of the unknown impedance	**[L3] [CO4]**	**[6M]**
8		Describe the operation of the Wheatstone bridge & derive the expression for current when the bridge is unbalanced.	**[L1] [CO4]**	**[12M]**
9	a)	Describe in detail about EMI &EMC with suitable examples.	**[L1] [CO4]**	**[6M]**
	b)	Explain the working principle & operation of Capacitance & Inductance bridge circuit.	**[L3] [CO4]**	**[6M]**
10		Write the operation of Kelvin Bridge and derive necessary equation	**[L3] [CO4]**	**[12M]**

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UNIT –V
SENSORS & TRANSDUCERS

1	a)	What are the differences between the active & passive transducers	**[L2] [CO5]**	**[6M]**
	b)	Explain the operation of potentiometric transducer	**[L2] [CO5]**	**[6M]**
2		Describe the operation of i) Resistive transducers ii) Capacitive transducers iii) Inductive transducers	**[L2] [CO5]**	**[12M]**
3	a)	Define a transducer. What are the different types of Transducers?	**[L1] [CO5]**	**[6M]**
	b)	Explain about any one of transducer to measure displacement.	**[L2] [CO5]**	**[6M]**
4	a)	Draw the diagram of Resistance Thermometer &explain briefly.	**[L3] [CO6]**	**[6M]**
	b)	Explain the operation of thermocouples and thermistors?	**[L2] [CO6]**	**[6M]**
5		What are the pressure measuring transducers .explain any one of them.	**[L1] [CO5]**	**[12M]**
6	a)	Discuss about Sensors and Transducers.	**[L1] [CO5]**	**[6M]**
	b)	How to convert linear variable displacement into electrical voltage using transducer.	**[L2] [CO5]**	**[6M]**
7	a)	With a neat sketch, explain the operation of piezo-electric transducers in detail.	**[L2] [CO5]**	**[6M]**
	b)	Briefly discuss about Velocity transducers	**[L2] [CO5]**	**[6M]**
8		With a neat sketch explain the operation of LVDT. What are the advantages & disadvantages?	**[L1] [CO6]**	**[12M]**
9	a)	Discuss about Accelerometer.	**[L1] [CO5]**	**[6M]**
	b)	Explain about vibration.	**[L2] [CO5]**	**[6M]**
10		How to measure the resistance using strain gauge & its applications.	**[L2] [CO6]**	**[12M]**

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