

17EC32

Visvesvaraya Technological University, Belagavi

MODEL QUESTION PAPER

3<sup>rd</sup> Semester, B.E (CBCS) EC/TC

Course: 17EC32- Electronic Instrumentation, *Set No. 2*

Time: 3 Hours

Max. Marks: 100

Note: (i) Answer Five full questions selecting any one full question from each Module.  
(ii) Question on a topic of a Module may appear in either its 1<sup>st</sup> or 2<sup>nd</sup> question.

Module-1			
1	(a)	List and explain the types of measurement errors.	8
	(b)	What is loading effect? Find the voltage reading and % error of each reading obtained with a voltmeter on (i) 5V range (ii) 10V range , if the instrument has a 20K $\Omega$ /V sensitivity and is connected across R <sub>b</sub> =5K $\Omega$ , R <sub>a</sub> =45K $\Omega$ and applied voltage V=50V.	8
	(c)	Explain Multi-range Ammeters with a neat diagram.	4
OR			
2	(a)	Explain (i) Accuracy (ii) Precision (iii) Significant Figures with example.	6
	(b)	Calculate the value of multiplier resistance for the multiple range dc voltmeter circuit having I <sub>m</sub> =50 $\mu$ A, R <sub>m</sub> =1K $\Omega$ , V <sub>1</sub> =3V, V <sub>2</sub> =10V and V <sub>3</sub> =30V.	4
	(c)	What is Thermocouple? Explain different types of Thermocouples.	10
Module-2			
3	(a)	Explain the Dual Slope Integrating type DVM with neat diagrams.	10
	(b)	Explain the working of Digital Frequency Meter with neat diagrams.	10
OR			
4	(a)	With help of neat diagrams explain the working of Successive Approximation ADC.	10
	(b)	Explain the Digital Measurement of time with neat diagrams.	10
Module-3			
5	(a)	Explain in detail all the features of CRT.	7
	(b)	Describe the operation of Function Generator with a neat diagram.	7
	(c)	Explain the operation of a Time Base Generator with a neat diagram.	6
OR			
6	(a)	Explain in detail the block diagram of CRO with a neat diagram.	8
	(b)	Describe the operation of AF sine and square wave generator with a neat diagram.	6
	(c)	Explain the measurement of frequency by Lissajous method with a neat diagram.	6
Module-4			
7	(a)	Explain in detail the Impedance measurement using Q meter with neat diagrams.	8
	(b)	Derive the Unbalanced equation for Wheatstone's Bridge using thevenin's equivalent circuit.	8
	(c)	With a neat diagram explain the Stroboscope.	4

		<b>OR</b>	
8	(a)	With a neat diagram explain the working of Wien's Bridge.	8
	(b)	Explain the working of Phase meter with neat diagrams.	8
	(c)	An inductive comparison bridge is used to measure inductive impedance at a frequency of 5 KHz. The bridge constants at balance are $L_3 = 10 \text{ mH}$ , $R_1 = 10 \text{ k}\Omega$ , $R_2 = 40 \text{ k}\Omega$ , $R_3 = 100 \Omega$ . Find the equivalent series circuit of the unknown impedance. (Draw the bridge circuit diagram and the equivalent series circuit).	4
		<b>Module-5</b>	
9	(a)	Explain the parameters and advantages of a Transducers.	10
	(b)	Derive expression for the Gauge factor $K=1+2\mu$ and explain the Bonded Resistance Wire Strain Gauges with a neat diagram.	10
		<b>OR</b>	
10	(a)	Explain in detail the Resistance Thermometer with neat diagrams and list the advantages of Resistance Thermometer.	10
	(b)	Explain Piezoelectric transducers.	6
	(c)	List the advantages of LVDT.	4

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