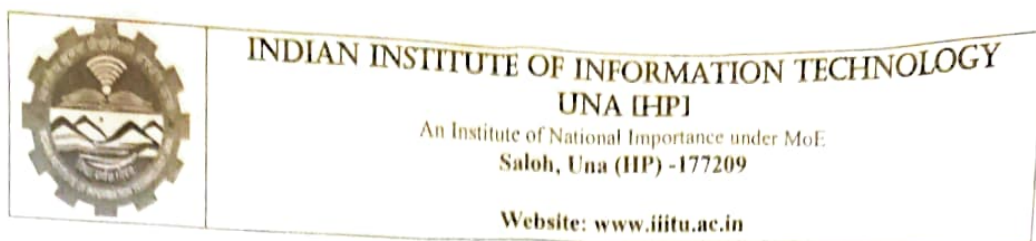


Roll No.
20222



AY 2021-22

B.Tech. in Electronics and Communication Engineering

END SEMESTER EXAM

Semester: IV

ECC404: Electronic Instrumentation and Measurements

Duration: 3 Hrs

Date: 19, May' 22

Max. Marks: 100

Answer all questions

Q. No.	Questions	Marks
1.	a) With the help of some suitable examples, differentiate between: (i) probable error (ii) random error (iii) systematic error	5
	b) Compare dual beam and dual trace CRO.	5
	c) Four arms of a Wheatstone bridge are as follows: $AB = 100 \Omega$, $BC = 10 \Omega$, $CD = 4 \Omega$, $DA = 50 \Omega$. A galvanometer with internal resistance of 100Ω is connected between BD, while a battery of 5-V dc is connected between AC. Find the current through the galvanometer. Find the value of the resistance to be put on the arm DA so that the bridge is balanced.	5
	d) Explain the constructional details and working principle of LVDT.	5
2.	a) What is a Voltage Controlled Oscillator (VCO)? In what way VCO is different from other oscillators?	5
	b) Describe with block diagram the operation of Pulse and Square Wave Generator.	5
	c) Explain how the followings are determined from the trace on a CRT? (i) the rms value of a sine wave (ii) the frequency of an unknown signal (iii) the phase angle of an unknown signal.	5
	d) Four resistors have the following ratings: $R1 = 55 \Omega \pm 5\%$, $R2 = 90 \Omega \pm 5\%$, $R3 = 75 \Omega \pm 5\%$, $R4 = 47 \Omega \pm 5\%$. Determine the magnitude and limiting error in ohm and in percent of these resistances connected in series.	5
3.	a) Explain the principle of operation of a single beam CRO.	5
	b) What is transducer? Discuss the various criteria for the selection of a particular transducer.	5
	c) Explain the working principle of signal generator.	5

	d)	What would be the frequency of oscillation of a Wien bridge oscillator if the resistors are $110\text{ k}\Omega$ and the capacitors are 1600 pF ?	5
4.	a)	How does a piezoelectric transducer work? What are the common materials used for it? Draw an equivalent circuit for this transducer. State its merits, demerits and applications.	5
	b)	Describe with the help of circuit diagram the working principle of Kelvin's bridge. Discuss its applications.	5
	c)	Explain the operating principle of a true RMS voltmeter.	5
	d)	What is a lock-in amplifier? Explain its working.	5
5.	a)	Explain the construction and working principle of a strain gauge and derive the expression for gauge factor.	5
	b)	The following values were obtained from the measurements of the value of a resistor in ohms: 147.2, 147.4, 147.9, 148.1, 147.1, 147.5, 147.6, 147.4, 147.6, and 147.5. Calculate (a) the arithmetic mean, (b) the average deviation, (c) the standard deviation, (d) the probable error of the average of the ten readings.	5
	c)	What is an I/P converter? Explain its working.	5
	d)	Compare the temperature transducers Platinum resistance type, Thermistors and Thermocouples on the basis of principle, characteristics, ranges and applications.	5

*****GOOD LUCK*****

INFORM