Seat No.: _____ Enrolment No.

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER– IV (New) EXAMINATION – WINTER 2019

Subject Code: 2141003 **Date: 12/12/2019**

Subject Name: Electronics Measurement and Instrumentation

Time: 10:30 AM TO 01:00 PM **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

			MARKS
Q.1	**(a)**	Define: (1) Accuracy (2) Precision (3) Resolution	**03**
	(b)	Explain: (1) Gross errors (2) Random errors.	**04**
	(c)	Describe the classification of standards in detail	**07**
Q.2	**(a)**	Explain the applications and limitations of Wheatstone bridge.	**03**
	(b)	Draw the circuit diagram of Kelvin bridge and derive the equation for unknown resistance.	**04**
	(c)	Draw the circuit diagram of Maxwell's bridge and derive the equation for unknown Inductance and resistance. What are its advantages and disadvantages?	**07**
		OR	
	(c)	Draw the circuit diagram of Hay's bridge and derive the equation for unknown Inductance and resistance. What are its advantages and disadvantages?	**07**
Q.3	**(a)**	Draw the circuit diagram of de-sauty's bridge and derive the equation for unknown Capatance.	**03**
	(b)	Draw the circuit diagram of Schering's bridge and derive the equation for unknown Capatance and resistance.	**04**
	(c)	An unbalanced Wheatstone bridge has following details: R_1= 1K,R_2=2.5K,R_3=3.5K,R_4=10K,R_G=300Ω, battery E=6V. Calculate the current through the Galvanometer.	**07**
		OR	
Q.3	**(a)**	A Maxwell bridge is used to measure inductive impedance. The bridge constants are: C_1=0.01µF,R_1=470 kΩ,R_2=5.1 kΩ, R_3=100 kΩ Find the series equivalent of the unknown impedance.	**03**
	(b)	Draw the diagram of digital frequency meter and explain its working.	**04**
	(c)	Find the series equivalent inductance and resistance of hay's bridge to null with the following bridge arms(clockwise ABCD): Arm AB: R_1=2 kΩ,C_1=1 µF, Arm BC: R_3=1 kΩ, Arm CD: unknown R_x and L_x Arm DA: R_2=10 kΩ ω= 3000 rad/s	**07**
Q.4	**(a)**	Draw the block diagram of a pulse generator. (only diagram, no description)	**03**

	(b)	Draw the block diagram of standard signal generator and explain its operation.	**04**
	(c)	Draw the circuit diagram of Wien's bridge and derive the equation for unknown frequency.	**07**

OR

Q.4	**(a)**	Draw the block diagram of sweep generator. (only diagram, no description).	**03**
	(b)	Draw the block diagram of AF sine and square wave generator and explain its working briefly.	**04**
	(c)	Draw the block diagram of true rms reading volt meter and explain its working in detail. What are its advantages and disadvantages?	**07**
Q.5	**(a)**	Draw the circuit diagram of basic wave analyzer and explain its working briefly.	**03**
	(b)	Draw the block diagram of function generator and explain its operation.	**04**
	(c)	Draw the block diagram of basic CRO and explain the function of each block.	**07**

OR

Q.5	**(a)**	Draw the basic construction of linear variable differential transducer(LVDT) and explain its working briefly.	**03**
	(b)	With diagram explain the working principle of spectrum analyzer.	**04**
	(c)	Draw the block diagram of digital storage oscilloscope and explain its principle of operation in detail.	**07**