

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER– IV(NEW) EXAMINATION – SUMMER 2023****Subject Code:2141003****Date:13-07-2023****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.
4. Simple and non-programmable scientific calculators are allowed.

- Q.1** (a) Define: (1) Resolution (2) Linearity and (3) Sensitivity. **03**  
 (b) The expected value of the voltage across a resistor is 80 V. However, the measurement gives a value of 79 V. Calculate (i) absolute error (ii) % error (iii) relative accuracy and (iv) % of accuracy. **04**  
 (c) Describe the working of a digital frequency meter with block diagram. **07**
- Q.2** (a) What are the limitations of Wheatstone bridge and how can it be eliminated? **03**  
 (b) Explain basic principle of oscillation. What is Barkhausen Criterion? **04**  
 (c) Draw Wien's Bridge diagram and derive equation for the measurement of unknown frequency. **07**
- OR**
- (c) An ac bridge with 1 kHz frequency has the following constants: Arm AB – capacitor of 0.5  $\mu$ F in parallel with 1k $\Omega$  resistance, Arm DA – resistance of 2 k $\Omega$ , Arm BC – capacitor of 0.5  $\mu$ F, Arm CD – unknown capacitor and resistor in series. Derive the balance condition and Also determine the unknown resistance, capacitance and dissipation factor. **07**
- Q.3** (a) Draw schematic block diagram of function generator. **03**  
 (b) Explain time period measurement circuit in detail. **04**  
 (c) Describe digital storage oscilloscope with schematic block diagram and state its Applications. **07**
- OR**
- Q.3** (a) Describe the basic principle of CRT. **03**  
 (b) What are the errors in measurements with frequency counters? Explain any one of them. **04**  
 (c) Explain True RMS Reading Voltmeter. **07**
- Q.4** (a) Write short note on piezoelectric transducer. **03**  
 (b) Which are the parameters for selecting transducers? **04**  
 (c) Explain harmonic distortion analyzer. **07**
- OR**
- Q.4** (a) Explain operation of I to P convertor in detail. **03**  
 (b) Explain digital phase measurement technique. **04**  
 (c) Describe the construction and working of LVDT. State advantages and disadvantages of it. **07**
- Q.5** (a) What are the objectives of DAS? **03**  
 (b) Explain the working of a Single channel DAS with block diagram. **04**  
 (c) Describe the Principle of Hall effect and measure the displacement and current using Hall sensor. **07**
- OR**
- Q.5** (a) Explain the concept of Earth Ground. **03**

- (b) Describe the Sample and Hold circuit operation. **04**
- (c) Explain the working of a Multi channel DAS with block diagram. **07**