Seat No.: _____ Enrolment No._____

# GUJARAT TECHNOLOGICAL UNIVERSITY

**BE – SEMESTER – VI EXAMINATION – WINTER 2015**

**Subject Code:160905** **Date:10/12/ 2015**

**Subject Name: Electrical and Electronic Measurement**

**Time:2:30pm to 5:00pm** **Total Marks: 70**

**Instructions:**

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

| | | | |
|---|---|---|---|
| **Q.1** | **(a)** | Define the following terms Gaussian distribution of data<br>(1) Precision index (2) Probable error (3)Standard deviation of mean<br>(4) Standard deviation of Standard deviation | **07** |
| | **(b)** | Define the term self inductance , Explain Maxwell's bridge for measurement of self inductance with vector diagram | **07** |
| **Q.2** | **(a)** | State common examples of high resistance measurements; explain difficulties in measurement of high resistances. | **07** |
| | **(b)** | Describe Kelvin's double Bridge with neat diagram | **07** |
| | | **OR** | |
| | **(b)** | A Wheatstone bridge has ratio arms of 1000 Ω and 100 Ω and being used to measure an unknown resistance of 25 Ω . Two galvanometers are available. Galvanometer 'A' has a resistance of 50 Ω and a sensitivity of 200 mm/μA and Galvanometer 'B' has a resistance of 600 Ω and a sensitivity of 500 mm/μA. Which of the two galvanometer more in sensitivities? Comment upon the results. | **07** |
| **Q.3** | **(a)** | Describe sources and null detectors used in a.c. bridge. | **07** |
| | **(b)** | What are the errors in the measurement of A. C. bridge? Suggest remedies for eliminating errors. | **07** |
| | | **OR** | |
| **Q.3** | **(a)** | How can the frequency be determined using a bridge? Draw this bridge and derive condition for balance. Why and how two resistances and capacitances are made equal? | **07** |
| | **(b)** | Explain Schering Bridge with diagram. | **07** |
| **Q.4** | **(a)** | Why instrument transformer is required? justify the statement "Never open secondary winding circuit of a current transformer while its primary winding is energized '' | **07** |
| | **(b)** | Explain Heterodyne wave analyzer. | **07** |
| | | **OR** | |
| **Q.4** | **(a)** | A C.T has a single turn primary and a 200 turns secondary winding. A secondary winding supplies a current of 5 A to a non-inductive burden of 1 Ohm. The requisite flux is set up in the core by mmf of 80Amp. The frequency is 50 Hz and the net cross section of the core is 1000 $mm^2$ . Calculate the ratio and phase angle of the transformer .Also find flux density in the core. Neglect all losses . | **07** |
| | **(b)** | Explain harmonic distortion analyzer | **07** |

| | | | |
|---|---|---|---|
| **Q.5** | **(a)** | Discuss the Varley loop test method for detection of cable fault. | **07** |
| | **(b)** | Describe the method for determination of B-H curve of magnetic material. | **07** |

**OR**

| | | | |
|---|---|---|---|
| **Q.5** | **(a)** | Explain Murray loop test for location cable fault | **07** |
| | **(b)** | Explain method for measurement of flux density | **07** |

**********