

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-III (NEW) - EXAMINATION – SUMMER 2017****Subject Code: 2130903****Date: 05/06/2017****Subject Name: Electrical Measurement and Measuring Instruments****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.

|            |  | <b>MARKS</b> |
|------------|--|--------------|
| <b>Q.1</b> | <b>Short Questions</b>   | <b>14</b>    |
|            | 1 Define Resolution.   |              |
|            | 2 Define Stability.  |              |
|            | 3 Define Active and Passive instruments.   |              |
|            | 4 Define Accuracy.   |              |
|            | 5 Define Indicating instruments.   |              |
|            | 6 Define Integrating instruments.  |              |
|            | 7 State methods used to produce damping torque.  |              |
|            | 8 State methods used for measurement of medium resistance.   |              |
|            | 9 Give the classification of transducers.  |              |
|            | 10 List out the errors present in dynamometer type wattmeter.  |              |
|            | 11 Define creeping.  |              |
|            | 12 What is phantom loading?  |              |
|            | 13 Give classification of graphic recorders.   |              |
|            | 14 List out the transducers used for measurement of temperature.   |              |
| <b>Q.2</b> | (a) Explain the voltage standards.   | <b>03</b>    |
|            | (b) Explain the various effects with which deflecting torque is produced.  | <b>04</b>    |
|            | (c) Explain construction working, torque equation, advantages and disadvantages of moving iron instrument with diagram.                  | <b>07</b>    |
|            | <b>OR</b>  |              |
|            | (c) Explain construction, working, advantages and disadvantages of hot wire instrument.  | <b>07</b>    |
| <b>Q.3</b> | (a) Explain principle of operation of thermo couple instrument.  | <b>03</b>    |
|            | (b) Explain controlling systems used in an instrument.   | <b>04</b>    |
|            | (c) Explain construction working, torque equation, advantages and disadvantages of permanent magnet moving coil instrument with diagram. | <b>07</b>    |
|            | <b>OR</b>  |              |
| <b>Q.3</b> | (a) List advantages and disadvantages of electrostatic instruments.  | <b>03</b>    |
|            | (b) Explain Digital storage oscilloscope with block diagram.   | <b>04</b>    |
|            | (c) Explain construction, working, torque equation, advantages and disadvantages of single phase induction                               | <b>07</b>    |

- type wattmeter with neat diagram.
- Q.4** (a) Derive bridge balance equation for Kelvin's double bridge. **03**  
(b) Explain construction and working of Megger. **04**  
(c) Explain Maxwell's inductance-capacitance bridge for measurement of inductance. Derive bridge balance equation and draw vector diagram. **07**
- OR**
- Q.4** (a) Explain CT and PT. **03**  
(b) Explain piezo electric transducer. **04**  
(c) Explain construction, working advantages and disadvantages of RTD with neat diagram. **07**
- Q.5** (a) Explain digital voltmeter with block diagram **03**  
(b) Explain harmonic analyzer. **04**  
(c) What is Hall effect? Describe construction, working principle and applications of hall effect transducer. **07**
- OR**
- Q.5** (a) Explain strip chart recorders. **03**  
(b) Explain block diagram of a general telemetry system **04**  
(c) Explain the construction and principle of working of a L.V.D.T. Explain how the magnitude and direction of the displacement of core of L.V.D.T. detected? **07**

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