

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-III (New) EXAMINATION – WINTER 2018

Subject Code:2130903

Date:05/12/2018

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.

- Q.1 (a)** Define the following terms: **03**
i) Resolution, ii) Sensitivity, iii) Threshold
- (b)** Define error and classify it in detail. **04**
- (c)** Define transducer and explain transducer selection factors. **07**
- Q.2 (a)** Explain advantages and limitations of Wheatstone's bridge. **03**
- (b)** Derive the generalized equation for bridge balance condition of an a.c. bridge with necessary diagram. **04**
- (c)** Describe the principle and characteristics of LVDT with necessary diagram. **07**
- OR**
- (c)** Write a technical note on : Hall effect transducer. **07**
- Q.3 (a)** List advantages of digital voltmeter. **03**
- (b)** Compare analog and digital instruments. **04**
- (c)** Explain Maxwell's bridge with necessary bridge balance equation and vector diagram. **07**
- OR**
- Q.3 (a)** Explain important features of a power analyzer. **03**
- (b)** Write a technical note on : Electronic Multimeter. **04**
- (c)** Draw the circuit diagram of Kelvin's double bridge used to measure low resistance. Also derive its bridge balance condition. **07**
- Q.4 (a)** Define : i) Active transducer ii) Passive transducer iii) Inverse transducer **03**
- (b)** Explain piezoelectric transducer. **04**
- (c)** Explain the construction and working of moving iron meter. Derive its torque equation. **07**
- OR**
- Q.4 (a)** Describe the use of multiplier in voltmeters. **03**
- (b)** Compare Moving coil and Moving iron instruments. **04**
- (c)** Derive the equation for gauge factor of a resistive strain gauge in terms of Poisson's ratio. **07**
- Q.5 (a)** Why PMMC instruments cannot be used for a.c. measurements? **03**
- (b)** Explain advantages and disadvantages of instrument transformers. **04**
- (c)** Define Telemetry. Explain with necessary block diagram the basic telemetry system. **07**
- OR**
- Q.5 (a)** Explain objective and requirements of recording data. **03**
- (b)** Explain principle of operation of basic strip chart recorder. **04**
- (c)** Explain the use of single wattmeter in measurement of 3-phase power. **07**
