Seat No: _____ **Enrollment No: _____**

PARUL UNIVERSITY

FACULTY OF ENGINEERING & TECHNOLOGY

B.Tech. Winter 2019 - 20 Examination

Semester: 5 **Date: 26/11/2019**
Subject Code: 03106302 **Time: 10:30am to 01:00pm**
Subject Name: Electrical Measurements **Total Marks: 60**

Instructions:
1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

Q.1 Objective Type Questions - (All are compulsory) (Each of one mark) (15)

1. Response of mechanical instruments to dynamic and transient conditions is _____.
2. The incapability of the system to faithfully measure, record or control the input signal in undistorted form is called _____.
3. Resistance of shunt is _____.
4. Megger is used for measurement of _____ resistance.
5. Sensitivity of digital instruments is _____.
6. Kelvin double bridge is used to measure _____ valued resistance.
7. Q – Factor of Hay's bridge is greater than 10. State True or False.
8. Thermistors have negative temperature coefficient of resistance. State True or False.
9. Transformers used in conjunction with measuring instruments for measurement purpose are called _____.
10. C-type Bourdon tube is used to measure_____.
11. Horizontally mounted Moving Iron instruments use _____.
    (a) Eddy current damping (c) Fluid friction damping
    (b) Electromagnetic damping (d) Air friction damping
12. The iron losses consist of _____.
    (a) Eddy current losses (c) Eddy current & Hysteresis losses
    (b) Hysteresis losses (d) None of above
13. _____ is (are) the application(s) of Wave Analyzer.
    (a) Electrical Measurements. (c) Vibration Measurements
    (b) Sound Measurements (d) All of above.
14. The lower limit of useful working range of transducer is determined by_____.
    (a) Minimum useful input level (c) cross-sensitivity
    (b) By transducer error & noise (d) dynamic response
15. Burden of current transformer is expressed in terms of _____
    (a) Secondary winding current (c) voltage, current & pf of secondary winding circuit
    (b) VA rating of transformer (d) None of above.

Q.2 Answer the following questions. **(Attempt any three)** **(15)**

A) Discuss the dynamic characteristics of measurement system.

B) Explain the test for measurement of flux density in ring specimen with necessary derivation.

C) State advantages of Electrical transducers.

D) Mention the advantages of Digital instruments.

Q.3 A) Explain working of basic digital voltmeter. **(07)**

B) Explain the construction of single phase Induction type Energy meter with neat diagram. **(08)**

OR

B) List out the factors causing errors in bridge circuit and also describe in brief the methods to reduce errors in bridge circuit. **(08)**

Q.4 A) For current transformer prove that $R \cong n + (I_m \sin\delta + I_e \cos\delta) / I_s$. where R is the transformation ratio of current transformer. Draw necessary phasor diagram. **(07)**

OR

A)Explain heterodyne wave analyzer with block diagram. **(07)**

B) (i) Distinguish between Null type and Deflection type of instruments **(04)**

(ii) Define following terms with respect to current transformer: **(04)**

(a) Transformation Ratio

(b) Ratio correction factor

(c) Turns ratio

(d) Total secondary winding burden.