

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**BE SEM 1<sup>st</sup> & 2<sup>nd</sup> (SPFU) REMEDIAL • EXAMINATION – SUMMER 2015**

**Subject Code: ENG006**

**Date: 10/06/2015**

**Subject Name: MEASUREMENT AND INSTRUMENTATION**

**Time: 02.30AM-05.00PM**

**Total Marks: 70**

**PART I : OBJECTIVE SECTION**

**INSTRUCTION: Question no.1 to 25 carry 1 mark and 26 to 30 carry 2 marks.**

- 1 The use of micrometer is to measure  
(A) Velocity (B) Acceleration  
(C) Angle (D) Length
- 2 S.I unit for electric current is  
(A) Volt (B) Coulomb  
(C) Candela (D) Ampere
- 3 Volt is a unit of  
(A) electric potential (B) electric current  
(C) electric charge (D) none of the above
- 4 Work is defined as that  
(A) force\*mass (B) force\*distance  
(C) force\* time (D) None of this.
- 5 The accuracy of an instrument is measured in terms of its  
(A) noise (B) error  
(C) resolution (D) Precision
- 6 Time required for a measuring instrument to respond to any change in input is its  
(A) dead time (B) number of significant digits  
(C) accuracy (D) threshold
- 7 The random error is also known as  
(A) instrumental error (B) Environmental error  
(C) Observational error (D) All of the above
- 8 The CRO is used to measure  
(A) voltage signal magnitude (B) voltage signal frequency  
(C) voltage signal angle (D) all of the above
- 9 The unit of electrical power is  
(A) Ampere (B) Henry  
(C) Watt (D) Volt
- 10 The household energy meter is  
(A) an indicating instrument (B) a recording instrument  
(C) an integrating instrument (D) none of the above

- 11 A multimeter consists of
- (A) voltmeter and current meter (B) voltmeter and ohm meter  
 (C) current meter and ohm meter (D) volt meter, current meter and ohm meter
- 12 The input impedance of a CRO is
- (A) zero (B) around 100 ohm  
 (C) around 1000 ohm (D) around one mega ohm
- 13 Zero adjustment is provided in multimeter for
- (A) changing the sensitivity (B) correcting zero point **Error! Not a valid link.**  
 (C) both (a) and (b) (D) none of the above
- 14 Single phase energy meters measure electric energy in
- (A) kW (B) kWh  
 (C) joule (D) none of the above
- 15 The time base signal of a CRO is
- (A) square wave signal (B) sinusoidal signal  
 (C) saw tooth signal (D) triangular wave signal
- 16 A device which Converts a physical quantity to an equivalent electrical quantity
- (A) Transformer (B) Transducer  
 (C) Rectifier (D) Circuit Breaker
- 17 Electrical Transducer are classified according to their
- (A) Current Conversion (B) Energy Conversion  
 (C) Voltage conversion (D) Level conversion
- 18 LVDT is which type of Transducer
- (A) Primary Transducer (B) Secondary Transducer  
 (C) Parallel Transducer (D) None of the these
- 19 An inverse Transducer converts
- (A) Electrical energy to any other form of energy (B) Electrical Energy to light energy  
 (C) Mechanical displacement into electrical signal (D) Electrical energy to mechanical form
- 20 Sensitivity of a Thermocouple is expressed
- (A) mV/C (B)  $\mu$ V/C  
 (C) mA/C (D)  $\mu$ A/C

- 21 Which of the following additional devices is required for measuring pressure with an LVDT
- (A) Bellows (B) Bourdon tubes  
(C) Bolometer (D) Either A or B
- 22 Thermocouples are
- (A) Passive transducer (B) Active Transducer  
(C) both Active and passive (D) None of the above
- 23 The drawbacks of thermocouples are that
- (A) They are less accurate than (B) They need compensating leads  
(C) Reference junction (D) all of above
- 24 Piezo electric crystal produce an emf
- (A) when external mechanical force (B) when external magnetic field is applied  
(C) when radiant energy stimulates (D) when the junction of two such crystal is heated
- 25 Platinum is the commonly used metal for resistance temperature detectors(RTDs) because
- (A) It is commercially available in (B) It is relatively stable under various environment  
(C) It has wide temperature (D) all of above
- 26 What is the dimension for charge?
- (A) MLIT (B) LIT  
(C) IT (D) I
- 27 A 0-300V voltmeter has an error of +/-2% of full scale deflection. What would be the range of readings if true voltage is 30 voltage?
- (A)24-36 V (B)29.4-30.6 V  
(C)20-40 V (D) none of the above
- 28 The period of a sine wave is 1/60 seconds. Its frequency is
- (A) 30 Hz (B) 60 Hz  
(C) 120 Hz (D) 15 Hz
- 29 Dummy strain gauges are used for
- (A) A calibration of strain gauge (B) compensation of temperature variation  
(C) Increasing bridge sensitivity (D) all of the above
- 30 The dynamic characteristics of capacitive transducers are similar to those of
- (A) low pass filter (B) High pass filter  
(C) Notch filter (D) band stop filter

**PART 2 : SUBJECTIVE SECTION(LQs)**

**Attempt Any Five questions:**

**35 Marks**

Q.1 Explain the construction and applications of C.R.O.

Q.2 Describe the working of induction type single phase energy meter.

Q.3 Define the terms:

A) True Value    B) Resolution    C) Drift    D) Dead Zone    E) sensitivity

F) Accuracy    G) Precision

Q.4 Explain the different types of errors in measurement by giving suitable examples.

Q.5 Explain with any one type of transducer measurement of temperature.

Q.6 what are the advantages of S.I Units?

Q.7 Enumerate the main static characteristics of measuring instruments.