Code: DE11 **Subject: ELECTRONIC INSTRUMENTATION & MEASUREMENTS** **DECEMBER 2007**

Time: 3 Hours **Max. Marks: 100**

NOTE: There are 9 Questions in all.

- **Question 1 is compulsory and carries 20 marks. Answer to Q. 1. must be written in the space provided for it in the answer book supplied and nowhere else.**
- **Out of the remaining EIGHT Questions answer any FIVE Questions. Each question carries 16 marks.**
- **Any required data not explicitly given, may be suitably assumed and stated.**

Q.1 Choose the correct or best alternative in the following: (2x10)

a. Systematic errors are

(A) Instrumental errors. **(B)** Environmental errors.
(C) Random errors. **(D)** Both **(A)** & **(B)**.

b. The wheat stone bridge method of resistance measurement is ideally suitable for the measurement of resistance values in the range of

(A) 0.001Ω to 1 Ω **(B)** 0.1Ω to 100 Ω
(C) 100Ω to 10 k Ω **(D)** 100kΩ to 10M Ω

c. In a CRO the quantity to be measured is applied across

(A) Focussing electrodes. **(B)** Cathode.
(C) Y-plates. **(D)** X-plates.

d. The Lissajous pattern with equal voltages of equal frequency and phase shift by 90º is

(A) Straight line. **(B)** Circle.
(C) Ellipse. **(D)** Dot.

e. DAC

(A) Stands for digital to analog converter.
(B) Referred to an encoding device.
(C) Is considered as a decoding device.
(D) Both **(A)** & **(C)**.

f. The accuracy of a digital voltmeter is specified in terms of

(A) Number of least significant digits.
(B) Percentage full scale reading.
(C) Percentage of the actual reading.
(D) Any of the above.

g. Thermocouples are

(A) Inverse transducer. **(B)** Active transducers.
(C) Passive transducers. **(D)** Both **(A)** & **(C)**.

h. LVDT is an

(A) Eddy current transformer. **(B)** Inductive transducer.
(C) Resistive transducer. **(D)** Capacitive transducer.

i. Function generator can produce _____ types of waveforms.

(A) Sine. **(B)** Square.
(C) Sawtooth. **(D)** All the above types.

j. Active probes are used for small signal measurements because their

(A) Attenuation is less. **(B)** Input impedance is less.
(C) Frequency is less. **(D)** Slow rise time signals to CRO.

Answer any FIVE Questions out of EIGHT Questions.
Each question carries 16 marks.

Q.2 a. Explain the terms
(i) Dead Band
(ii) Linearity
(iii) Precision. **(3x3)**

b. What are the class of standards available for use & calibration process? **(7)**

Q.3 a. Draw the diagram of a multimeter & explain its operations. **(8)**

b. Derive the two conditions for Wein's bridge balance, which results in the expression for calculating the resistance ratio and frequency of applied voltage. **(8)**

Q.4 a. Explain the working of a sweep generator with a suitable block diagram. **(8)**

b. Define the terms sensitivity and selectivity of a radio receiver. Explain how sensitivity and selectivity are measured? **(8)**

Q.5 a. Explain the basic diagram of a CRT. **(8)**

b. Explain the function of delay line used in a CRO. **(8)**

Q.6 a. Explain how, frequency can be measured by Lissajous Method. **(8)**

b. Explain Harmonic Distortion Analyser using bridged T- network. **(8)**

Q.7 a. Draw the circuit of an R-2R type of D/A converter and explain its operation. **(8)**

b. Explain how an electronic counter is used in frequency mode and period mode. **(8)**

Q.8 a. Describe the working of an LVDT with the help of a diagram. **(8)**

b. Differentiate between
(i) Active & Passive Transducer.
(ii) Transducer & Transponder. **(4x2)**

Q.9 Write notes on:
(i) Bolometer method of power measurement.
(ii) Q -meter. **(8x2)**