Code: D-11 Subject: ELECTRONIC INSTRUMENTATION & MEASUREMENTS
Time: 3 Hours June 2006 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. In measurement systems which of the following static characteristics are desirable

(A) Accuracy **(B)** Sensitivity
(C) Reproducibility **(D)** All of above

b. Electrostatic type of instruments are primarily used as

(A) Watt meter **(B)** Ohm meter
(C) Voltmeter **(D)** Ammeter

c. For a radio receiver, its selectivity indicates

(A) The measure of noise produced
(B) The ability to reject unwanted signal
(C) A response which is spurious
(D) The receiver's ability to pick up weak signals

d. Maxwell inductance capacitance bridge is used for measurement of

(A) Low Q coils **(B)** Medium Q coils
(C) High Q coils **(D)** Low and high Q coils

e. The important parts of a function generator are _____.

(A) Sine wave amplifier, voltage comparator multi vibrator and resistance diode shaping circuit.
(B) Wien bridge oscillator, voltage comparator multi vibrator and square wave shaper.
(C) Two types of constant current sources, integrator and sine wave amplfier.
(D) Two types of constant current sources, voltage comparator multi vibrator and resistance – diode shaping circuit.

f. A Hall effect transducer can be used for measurement of

(A) power **(B)** current
(C) displacement **(D)** all of above

g. Digital instruments have input impedance of the order of

(A) ohms **(B)** kilo-ohms
(C) mega ohms **(D)** milli ohms

h. In a CRT the focussing anode is located

(A) between pre-accelerating and accelerating anodes.
(B) after accelerating anode.
(C) before pre-accelerating anode.
(D) post accelerating anode.

i. Period measurement is done in frequency meters for achieving high accuracy in the case of

(A) high frequencies. **(B)** medium frequencies.
(C) d.c. **(D)** low frequency.

j. The function of a spectrum analyser is to _____.

(A) measure the signals in the audio frequency range.
(B) convert the analogue waveform over time period T into N samples.
(C) display a range of frequencies over the given frequency band.
(D) Compute the total distortion factor given by $D = \sqrt{D_2^2 + D_3^2 + D_4^2}$

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

Q.2 a. Explain following terms
(i) Accuracy (ii) Precision **(8)**

b. What are sources of errors in measurement? Explain. **(8)**

Q.3 a. Explain the working of ramp type digital voltmeter using block diagram. **(8)**

b. Explain how frequency can be determined using Wien's bridge. **(8)**

Q.4 a. What is a sweep frequency generator? Explain its working with the help of block diagram. **(8)**

b. Name the important parts of a digital storage oscilloscope and describe any two of

them. **(8)**

Q.5 a. Describe briefly dual trace and dual beam CRO. **(8)**

b. Describe bolometer method of power measurement. **(8)**

Q.6 a. Explain how phase and frequency can be measured using a CRO. **(8)**

b. Draw the block diagram of a harmonic distortion analyser and explain its working. **(8)**

Q.7 a. Explain the working of a sample and hold circuit. **(8)**

b. Briefly describe multiplexing methods used in a Data Acquisition system. **(8)**

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

b. What is a piezoelectric transducer? Give examples and explain its working. **(8)**

Q.9 a. Explain the principle of working of an RLC meter. **(8)**

b. Write a short note on active and passive transducers. **(8)**