

Code: DE-11 Subject: ELECTRONIC INSTRUMENTATION & MEASUREMENTS

JUNE 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.

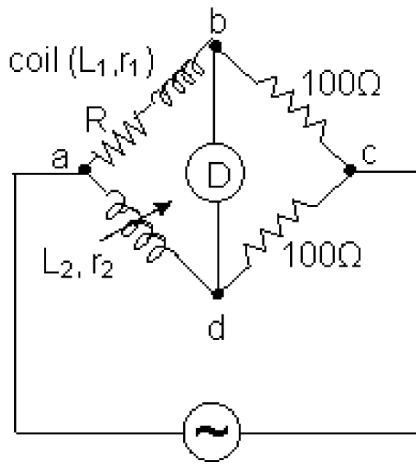
Q.1 Choose the correct or best alternative in the following: (2x10)

- a. A set of readings has a wide range and therefore it has
- (A) Low precision (B) High precision
(C) Low accuracy (D) High accuracy
- b. A reading is recorded as 32.195 V. The reading has
- (A) two significant digits (B) three significant digits
(C) five significant digits (D) none
- c. Electrostatic type of instruments are primarily used as
- (A) Ammeters (B) Watt meters
(C) Voltmeters (D) Ohmmeters
- d. A wheatstone bridge cannot be used for precision measurements because errors are introduced into an account of
- (A) Resistance of connecting leads (B) Thermo-electric emf
(C) contact resistance (D) all of above
- e. Frequency can be measured using
- (A) Maxwell's bridge (B) Schering bridge
(C) Wein's bridge (D) None of above
- f. Digital instruments have input impedance of the order of
- (A) ohms (B) K Ω
(C) Mega ohms (D) milli ohms
- g. LVDT is
- (A) Resistance transducer (B) Inductive transducer
(C) Hall effect transducer (D) None of above

- h. A triangle wave shape is obtained
- (A) By integrating a square wave
 (B) By differentiating a sine wave
 (C) By differentiating a square wave
 (D) By integrating a sine wave
- i. Capacitive transducers are generally used for
- (A) Static measurement (B) Dynamic measurement
 (C) both (A) and (B) (D) Transient measurement
- j. Hall effect transducer can be used for measurement for
- (A) Power (B) Current
 (C) Displacement (D) All of above.

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

- Q.2** a. What are different types of errors. Explain briefly. **(8)**
- b. Explain following terms.
- (i) Dead band (ii) Hysteresis **(8)**
- Q.3** a. Describe briefly the standards and their classification. **(8)**
- b. State advantages and disadvantages of thermo-electric instruments. **(8)**
- Q.4** a. Using basic arrangement describe the principle of operation of rectifier instruments. **(8)**
- b. Describe the principle of operation of Hay's Bridge. **(8)**
- Q.5** a. A Maxwell's inductance comparison bridge is shown below. Arm ab consists of a coil with inductance L_1 and resistance r_1 in series with resistance R . Arm bc and cd are each a non inductive resistance of 100Ω . Arm ad consists of standard variable inductor L_2 of resistance 32.7Ω . Balance is obtained when $L_2=47.8$ mH and $R=1.36\Omega$. Find the resistance and inductance of the coil in arm ab. **(8)**



b. Using block diagram explain working of sweep frequency generator. (8)

Q.6 a. Describe the different types of oscilloscope probes used. (8)

b. Describe dual trace oscilloscope using the block diagram. (8)

Q.7 a. Describe method for measurement of flux by induced EMF. (8)

b. Describe the operation of ramp type Digital voltmeter. (8)

Q.8 a. Describe briefly the method used for time period measurement. (8)

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

Q.9 a. Describe in brief active and passive transducers. (8)

b. Write a short note on digital to analog multiplexing. (8)