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[This question paper contains 4 printed pages.]

Your Roll No. ....

Sr. No. of Question Paper : 1087

Unique Paper Code : 32223904

Name of the Paper : Basic Instrumentation Skills

Name of the Course : B.Sc. (Hons. + Prog.)\_CBCS  
\_SEC

Semester : IV

Duration : 3 Hours

Maximum Marks : 50

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt **Five** questions in all. Question No. 1 is compulsory. **All** questions carry equal marks.

1. Answer any **five** of the following :

- (a) What are the general characteristics of a digital voltmeter?
- (b) When do dynamic characteristics play an important role in instruments?

P.T.O.



- (c) A 0-500 V voltmeter has a guaranteed accuracy of 2% of full-scale reading. The voltage measured by the voltmeter is 250 volts. Determine the limiting error in percentage.
- (d) Define the term "retentivity" in context with CRO.
- (e) How is the Q meter used for measuring the Inductance of coil?
- (f) When do we say that the bridge is balanced? Justify.
- (g) Explain briefly two important features of an electronic voltmeter.
- (h) What is Lissajous pattern? (5×2)
2. (a) Why do most manufacturers specify the accuracy of instruments within a certain percentage of a full scale reading instead of specifying accurately?
- (b) What is the significance of sensitivity in voltmeters? What will happen if a voltmeter of low sensitivity is used? Explain it with examples of loading effect. (4+6)

3. (a) Explain the principle of voltage measurements in an AC millivoltmeter with a block diagram.
- (b) Discuss the specifications of an AC millivoltmeter. (6+4)
4. (a) Draw the basic block diagram of an Oscilloscope and explain the function of each block.
- (b) Explain in brief how the measurement of AC and DC voltages along with frequency can be done using a CRO. (6+4)
5. (a) Differentiate between pulse and square wave generator.
- (b) Write the specifications of a LCR bridge and discuss the importance of a LCR bridge. (4+6)
6. (a) What are digital voltmeters? List its six performance characteristics.
- (b) A  $3\frac{1}{2}$  digit voltmeter is used for voltage measurement. Find its resolution. How would 0.6297 V be displayed on 1 V and 10 V ranges. (6+4)



7. (a) Explain the working principle of a frequency counter with regard to time interval, frequency and period measurements.

(b) What do you understand about the accuracy and the resolution of a frequency counter? (6+4)