Sr. No. of Question Paper : 2145   GC-3   Your Roll No...............

Unique Paper Code : 32223904

Name of the Paper : Basic Instrumentation Skills

Name of the Course : **B.Sc. (Hons.) Physics (CBCS) Skill Enhancement Course**

Semester : III

Duration : 3 Hours   Maximum Marks : 50

Instructions for Candidates

1. Write your Roll No. on the top immediately on the receipt of this question paper.

2. Attempt any **five** questions in all.

1. (a) Explain accuracy, precision and resolution of an instrument.

    (b) A set of independent voltage measurement taken by four observers was recorded as 117.02 V, 117.11 V, 117.08 V and 117.03 V. Calculate average voltage and average deviation.   (5,5)

2. (a) How is an electronic voltmeter better than a conventional VOM ? Explain it in terms of input impedance and sensitivity.

    (b) Discuss the loading effect of a multimeter with the help of an example.

    (c) Calculate the value of multiple resistance on the 50 V range of a dc voltmeter that uses a 500 μA meter movement with an internal resistance of 1 kΩ.   (4,4,2)

3. (a) Explain the principle of working of DSO.

    (b) How is the electrostatic focusing achieved in CRT ? Explain it with the help of a diagram.   (5,5)

4. (a) What is a wave analyzer ? Explain it with the help of a diagram.

    (b) Explain the working of a pulse generator with the help of a block diagram. (5,5)

5. (a) What are the advantages of using digital instruments over analog instruments ?

    (b) Draw the basic circuit diagram for a Q-meter. Explain its operation and write the equation for Q factor. (3,7)

6. (a) Discuss any LCR bridge in detail with the help of a diagram.

    (b) A Maxwell Bridge is used to measure inductive impedance. At balance, the bridge constants are $C_1 = 0.01$ μF, $R_1 = 470$ kΩ, $R_2 = 5.1$ kΩ, $R_3 = 100$ kΩ. Find the series equivalent of unknown impedance. (6,4)

7. (a) How is the universal counter used for the measurement of frequency ?

    (b) What is a multimeter ? How is it used as a voltmeter ? (5,5)