

Name of the Department: Department of Physics and Astrophysics
Name of the Course: B. Sc. (Prog)/ B.Sc. (Hons.) Physics (CBCS) SEC
Name of the Paper: Basic Instrumentation Skills
Semester: V / III
Unique Paper Code: 32223904
Question Paper Set Number: SET B
Duration: 3 Hours **Max Marks: 50**

Instructions for Candidates

All questions carry equal marks

Attempt any four questions in all.

Q1. (a) Explain accuracy, precision and resolution of an instrument. Explain different type of errors. Tabulate few sources of errors. **(3, 3, 2.5)**

(b) Give step by step procedure for testing a transistor by a multimeter. **(4)**

Q2. (a) Why digital multimeters are preferred over the conventional analog multimeters for testing an electronics circuit? How a multimeter is used both as an ammeter and a voltmeter? Explain with suitable example for each. Explain basic block diagram of multimeter.

(2, 2, 3.5)

(b) What is loading effect in measurement of voltages across a load by voltmeter? What is the cause of this effect? Suggest suitable methods of minimizing this effect. **(2,1,2)**

Q3. (a) Explain the working of CRO with the help of its block diagram. **(5)**

(b) Explain 3 major advantages of DSO over CRO. Explain different mode of operation in DSO. How is CRO used to measure the value of voltage and frequency of a given signal explain with suitable example. **(3, 2.5, 2)**

Q4. (a) Explain the working of a pulse generator with the help of a block diagram. Give basic difference between pulse generator and square wave generator **(6,2)**

(b) What are the advantages of using digital instruments over analog instruments ? **(4.5)**

Q5. Draw the basic circuit diagram for a Q-meter. Explain its operation and write the equation for Q factor. Give three applications of Q-meter. **(3,7, 2.5)**

Q6. Explain the block diagram of LCR bridge in detail. Name different type of LCR bridges for measurement of Resistance (R), inductance (L). Name the basic bridges used for measurement of capacitive reactance. Give its necessary theory. **(6,1, 5.5)**