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End Semester Examination, December 2024
B. Sc. (H) Physics – 5th Semester
BASIC INSTRUMENTATION SKILLS (BSPH305A)

Time: 2.5 hrs.

Max Marks: **50**

Note: Marks are indicated against each question.

PART-A

Note: **Attempt 5 out of 7 questions.**

- Q.1 (a) How to Achieve High Accuracy and Precision? [CO-1] [L-3] **2**
(b) How does a multimeter measure resistance? [CO-2] [L-3] **2**
(c) A digital multimeter has an accuracy specification of $\pm(0.5\% + 2 \text{ digits})$ for DC voltage measurement. If you are measuring a voltage of 50.0 V, what is the possible range of errors in the reading? [CO-2] [L-4] **2**
(d) Explain the working principle of an amplifier-rectifier type AC millivoltmeter. [CO-2] [L-2] **2**
(e) Explain the purpose of electrostatic focusing on a CRT. [CO-1] [L-2] **2**
(f) List two key specifications of a CRO and their significance. [CO-1] [L-2] **2**
(g) A thermometer reads 95.45 °C and the static correction given in the correction curve is -0.08 °C. Determine the true value of the temperature. [CO-1] [L-5] **2**

PART-B

- Q.2 (a) Explain the significance of "counts" in the specification of a digital multimeter. [CO-1] [L-2] **10**
(b) What is the difference between counts and digits of a multimeter.
OR
(a) What is the significance of the accuracy specification in a multimeter?
(b) A voltage has a true value of 1.50 V. An analog indicating instrument with a scale range of 0 – 2.50 V shows a voltage of 1.46 V. What are the values of absolute error and correction? [CO-1] [L-4] **10**

- Q.3 Draw, label and explain the basic block diagram of an amplifier-rectifier type AC millivoltmeter.

5[CO3] [L1]
[CO-2] [L-2] **10**

OR

Compare and contrast the amplifier-rectifier and rectifier-amplifier types of AC millivoltmeters. Discuss their advantages, disadvantages, and applications. [CO-3] [L-4] **10**

- Q.4 Describe the construction and working of the Cathode Ray Tube (CRT) with a focus on the electron gun, electrostatic focusing, and screen phosphor. [CO-4] [L-1] **10**

OR

Draw and explain the block diagram of a basic Cathode Ray Oscilloscope (CRO). [CO- 4] [L-1] **10**

- Q.5 What are the advantages of electronic voltmeter over analog voltmeter. Draw the block diagram of a digital voltmeter. [CO-3] [L-2] **10**

OR

What are the 4 types of digital voltmeter. Explain with block diagram

[CO- 3] [L-2] **10**