

203/Phs(N)

UG/2nd Sem/PHY-SEC-T-02/24

U.G. 2nd Semester Examination - 2024

PHYSICS

[Skill Enhancement Course (SEC)]

Course Code : PHY-SEC-T-02

(Basic Instrumentational Skill)

[NEP-2020]

Full Marks : 35

Time : $1\frac{1}{2}$ Hours

The figures in the right-hand margin indicate marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP-A

1. Answer any **five** questions : $1 \times 5 = 5$
- a) Write an equation of an a.c voltage V with peak value 100 and frequency 50Hz.
 - b) What is the internal resistance of an ideal ammeter?
 - c) What is loading effects?
 - d) Write down the units of resistance and inductance.
 - e) Write down the colour code for measuring resistance.

[Turn over]

- f) Distinguish between digital and analogue instrument.
- g) Write any two uses of CRO.

GROUP-B

2. Answer any **two** questions : $5 \times 2 = 10$
- a) What is fluorescent screen? Why it is used in a CRT? Distinguish between a CRT and CRO. $1+2+2$
- b) Write down the steps for measuring a.c current and resistance of wire by a conventional multimeter. 5
- c) Discuss the working principle of a frequency counter. 5
- d) Present a neat diagram of a Q-meter circuit? Write down the working principle of Q-meter circuit. $3+2$

GROUP-C

3. Answer any **two** questions : $10 \times 2 = 20$
- a) Write down the working principle of RLC bridge. What is the working principle of pulse generator and function generator? $5+5$

- b) Draw a block diagram of digital frequency counter and write down the working principle. The expected value of a voltage across a resistor is 50V. However the measurement gives value of 49V. Calculate absolute error, relative error and percentage error. 6+4
- c) Discuss accuracy, precision and resolution of an instrument used in some measurement. What do you mean by average deviation and standard deviation? A set of independent voltage measurement takes 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. 3+4+3
- d) Draw the basic block diagram of a digital voltmeter (DVM). Write down the working principle of a DVM. What is the significance of ADC in DVM? 3+5+2