

U.G. 2nd Semester Examination - 2025**PHYSICS****[Skill Enhancement Course (SEC)]****Course Code : PHY-SEC-T-02****(Basic Instrumentation Skills)****[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) What is Range and Resolution of an electronic instrument?
 - b) What is a Pulse signal? What is pulse width?
 - c) What is a Q-meter and what is its use?
 - d) What is input impedance of a meter? What should be its value for ideal voltmeter?
 - e) Why you cannot measure AC voltage with DC voltmeter?
 - f) What is RMS voltage and peak to peak voltage?

[Turn over]

- g) What is Aquadag coating and where is it used?
- h) What are the typical uses of function generator?

GROUP-B

2. Answer any two questions : $5 \times 2 = 10$

- a) What is loading effect and how it affects electrical measurement? What are advantages of digital meters over analog meters? $2+3$
- b) What is sensitivity of a meter? What is continuity test in a multimeter? Mention the steps to measure an unknown resistance using a multimeter. $1+2+2$
- c) What does a Digital Storage Oscilloscope (DSO) store/save? What are the advantages of a DSO compared to CRO? What is ADC? $1+3+1$
- d) What is a distortion meter and what it measures? What instrument is used to see frequency components in a waveform? What is a signal generator and its use? $2+1+2$

GROUP-C

3. Answer any two questions : $10 \times 2 = 20$

- a) Draw Schematic diagram of a CRT tube and label its various parts. What are the function of control grid and focusing anode? What is visual persistence and why it is important? $5+3+2$
- b) Draw block diagram of a Digital Storage oscilloscope and label its various parts. What is the function of attenuator and vertical amplifier in a oscilloscope? What is bandwidth? $5+4+1$
- c) Draw block diagram of a Multimeter and label its various parts. What is Shunt resistance and why it is needed? Which multimeter — Digital or Analog, has less loading effect? $6+3+1$
- d) Draw block diagram of an AC milli-voltmeter and label its parts. What is an impedance bridge? Draw an impedance bridge suitable for estimation of unknown capacitance (C_x) with internal resistance (R_x). Find the equations for balance condition in this bridge. $4+1+3+2$