63 (FY)SEM–1/SEC/PHYSEC1013

2025

PHYSICS

(SEC)

Paper : PHYSEC1013

(Instrumentation Skills in Physics–I)

Full Marks : 40

Pass Marks : 16

Time : Two hours

The figures in the margin indicate full marks for the questions.

1. Answer the following questions : 1×5=5

   (a) Below which instrument is used to measure the diameter of an object to an accuracy of 0.01*mm*?

   (i) Vernier Caliper

   (ii) Meter Scale

   (iii) Screw Gauge

   (iv) All of the above

(b) An analog multimeter has to Calibrate before measuring a

(i) Resistance

(ii) Current

(iii) Voltage

(iv) Capacitance

(c) Time domain oscillascope requires a

(i) Amplifier

(ii) Sweep generator

(iii) Rectifier

(iv) Modulator

(d) In cathode ray tube, electrons are emitted from the cathode due to

(i) Photo emission

(ii) Field emission

(iii) Thermionic emission

(iv) Secondary emission

(e) Q-Meter is used to measure

(i) Temperature

(ii) Quality factors

(iii) Quality Conductor

(iv) None of the above

2. Answer ***any five*** : 2×5=10

(a) Write the role of a filter in a regulated power supply.

(b) What is the function of an electron gun in CRO ?

(c) What are Lissajous patterns, how it forms ?

(d) Draw the block diagram of a Digital storage oscilloscope.

(e) Write how to measure the value of a resistance using colour code.

(f) What is galvanometer current and Shunt resistance ?

3. Answer the following questions : ***(any three)*** 5×3=15

(a) What is Transducers ? What are different types of transducer and their use ?

(b) What is LCR circuit ? Write the expression for impedence (Z) of LCR bridge. What is its value at resonance ?

(c) How a signal generator can produce ac signal ? Draw Block diagram of a signal generator.

(d) What is Q-Meter and what is its purpose in electrical measurement? Draw the Block diagram of Q-Meter. 3+2=5

(e) Draw a Cathode Ray Tube (CRT) and show its various parts.

4. Answer the following questions : ***(any one)*** 10×1=10

(a) Draw the Block diagram of a CRO and explain the working principles of its different parts.

(b) Write the principles of measurement of dc voltage and dc current by digital multimeter.