

63(FY)SEM-1/PHYSEC1013

2024

PHYSICS

Paper : PHYSEC1013

(Instrumentation Skills in Physics-I)

Full Marks : 40

Pas Marks : 16

Time : Two hours

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

1. Choose the correct answer from the following: 1×5=15

(a) Which of the following cannot be measured by a multimeter?

- (i) Voltage
- (ii) Current
- (iii) Resistance
- (iv) Capacitance

(b) What is SI unit of current

(i) Volt

(ii) Ampere

(iii) Ohm

(iv) Henry

(c) The value of resistance for colour code brown, black, red, silver is :

(i) 1 K..... \pm 10%

(ii) 10 K..... \pm 5%

(iii) 1 K..... \pm 5%

(iv) 10 K..... \pm 10%

(d) Which of the following part is called as the heart of CRO ?

(i) Sweep generator

(ii) Trigger circuit

(iii) CRT

(iv) Amplifier

(e) What is the purpose of sampling in DSO operation ?

(i) Control time base signal

(ii) Convert analog signal to digital

(iii) Convert digital signal to analog

(iv) Visualize the signal on screen

2. Answer **any five** of the following questions:
2×5=10

(a) Distinguish between direct and indirect measurement in physics.

(b) What is CRT ?

(c) What is a sweep generator in CRO ?

(d) Draw the block diagram of function generator.

(e) What is wave analyser ?

(f) Draw the block diagram of a pulse generator.

(g) What is RTD ?

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

(a) Explain accuracy, precision and sensitivity of an instrument. 5

(b) What is a multimeter ? How is it used as a voltmeter and ammeter ? 1+2+2

(c) Discuss the loading effect of a voltmeter with the help of an example. 5

(d) Discuss any LCR bridge with the help of a diagram. 5

(e) Write the main difference between a transducer and a sensor. 5

4. Answer **any one** of the following questions:

10×1=10

(a) What are the advantages of using digital instruments over analog instruments? Draw the basic block diagram for a Q-meter. Explain its operation and write the equation for Q factor. 2+3+3+2

(b) Draw the block diagram of a DSO? Explain the working of it. Which function makes the stable waveform displayed on the DSO screen? Write the major advantages of DSO. 3+3+1+3