

B.Sc. PHYSICS
THIRD SEMESTER
BASIC INSTRUMENTATIONAL SKILL
BSP – 306 [SPECIAL REPEAT]
[USE OMR FOR OBJECTIVE PART]

SET
A

Duration: 1 hr 30 min.

Full Marks: 35

Time: 15 min.

(Objective)

Marks: 10

Choose the correct answer from the following:

1X10=10

- The ratio of incremental output to incremental input of a measuring instrument gives
 - sensitivity
 - precession
 - span
 - accuracy
- Range of an instrument from minimum to maximum value is called
 - sensitivity
 - precession
 - span
 - accuracy
- If a thermometer has a scale from -40°C to 110°C , then its span is
 - 70°C
 - 150°C
 - 110°C
 - -40°C
- Ammeter uses a _____ in parallel with the basic meter. (Fill in the blank)
 - low resistance
 - high resistance
 - low capacitor
 - high capacitor
- A basic moving coil system can be converted to a dc ammeter by adding a suitable _____ in _____. (Choose the correct pair of words).
 - shunt resistor, parallel
 - capacitor, parallel
 - shunt resistor, perpendicular
 - capacitor, perpendicular
- The knob for intensity control of a CRO is connected to
 - heater
 - grid
 - cathode
 - anode
- Non-electrical quantities like pressure, temperature, strain, accelerations are converted to electrical signals by using
 - capacitors
 - signal modifier
 - transducer
 - indicating device
- _____ is called the 'heart' of an oscilloscope. (Fill in the blank).
 - Electron Gun
 - Deflecting Plates
 - Cathode ray tube
 - Glass envelope
- The shape of a Lissajous figure depends on
 - amplitude
 - Phase difference
 - Ratio of frequency of two waves
 - All of the these

10. A function generator can produce
- a. sine waves only
 - b. square waves only
 - c. sine and triangular waves
 - d. All of these

(Descriptive)

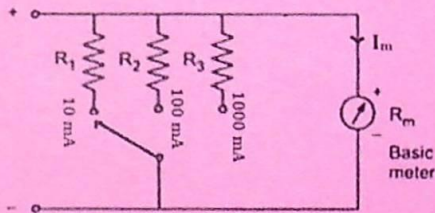
Time: 1 hrs. 15 min.

Marks: 25

[Answer question no.1 & any two (2) from the rest]

1. Explain briefly with diagram, how a basic meter (moving coil) works. 3+1+1
=5
Explain with diagram how to convert a basic meter into
 - a. a dc ammeter
 - b. a dc voltmeter

2. a. It is required to convert a 5 mA meter with 20Ω internal resistance into a 5 A current. Calculate the value of the shunt resistance required. 1+4=5
b. You are to design a multi-range ammeter as shown in the figure below. Calculate the values of the shunt resistances R_1 , R_2 , and R_3 , need to apply in terminals in order to get current ranges 10 mA, 100 mA, and 1000 mA, respectively. (Given: unshunted meter has resistance $R_m=100\Omega$, and current $I_m=1\text{mA}$).



3. What are the four major components of a Cathode Ray Tube (CRT)? 1+4=5
With proper diagram, explain the function of the electron gun assembly in focusing and accelerating the electron beam in a CRT.

4. What are the two primary functions of Aquadag coated inside the CRT Explain briefly the functions of deflecting plates (Horizontal and Vertical) of a CRT 2+3=5

5. Deduce the equation for Deflection Sensitivity of a CRT. 5

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