REV-01
BSP/02/05

2023/12

SET A

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

Duration: 1 hr 30 min. **Full Marks: 35**

(Objective)

Time: 15 min. **Marks: 10**

Choose the correct answer from the following: ***1X10=10***

1. The ratio of incremental output to incremental input of a measuring instrument gives
   a. sensitivity b. precession
   c. span d. accuracy

2. Range of an instrument from minimum to maximum value is called
   a. sensitivity b. precession
   c. span d. accuracy

3. If a thermometer has a scale from -40o to 110oC, then its span is
   a. 70°C b. 150°C
   c. 110°C d. -40°C

4. Ammeter uses a _____ _____ in parallel with the basic meter. (Fill in the blank)
   a. low resistance b. high resistance
   c. low capacitor d. high capacitor

5. A basic moving coil system can be converted to a dc ammeter by adding a suitable _____ in _____ . (Choose the correct pair of words).
   a. shunt resistor, parallel b. capacitor, parallel
   c. shunt resistor, perpendicular d. capacitor, perpendicular

6. The knob for intensity control of a CRO is connected to
   a. heater b. grid
   c. cathode d. anode

7. Non-electrical quantities like pressure, temperature, strain, accelerations are converted to electrical signals by using
   a. capacitors b. signal modifier
   c. transducer d. indicating device

8. _____ is called the 'heart' of an oscilloscope. (Fill in the blank).
   a. Electron Gun b. Deflecting Plates
   c. Cathode ray tube d. Glass envelope

9. The shape of a Lissajous figure depends on
   a. amplitude b. Phase difference
   c. Ratio of frequency of two waves d. 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

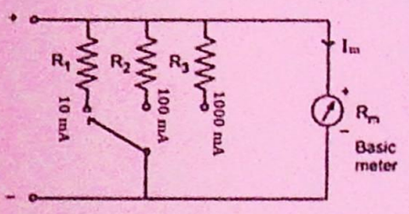
Descriptive

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=100Ω, and current I_m=1mA).



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

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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