PHSG SEM 3 CC 6 PRACTICAL-2022

F.M: 30

Answer ***any one*** question from the following

1. a) What is the coefficient of linear expansion of the material of rod? 2

b) What is the unit of the coefficient of linear expansion of the material of rod? 1

c) Write down the theory for determining the coefficient of linear expansion of the material of rod by optical lever. 10

d) Make a table for determining the displacement of reflected ray along the scale. 7

e) Draw the diagram for determining the displacement of reflected ray along the scale and derive the expression for said displacement from the diagram 8+2

2. a) Write down the theory for determining the coefficient of thermal conductivity of the material of a bad conductor by Lee and Charlton's disc method. 8

b) What is Bedford's correction? And why it is necessary? 3+3

c) Make a table for drawing the cooling curve of the lower metal disc. 3

d) Draw nature of the graph by plotting time along x-axis and temperature along Y-axis (cooling curve) of the lower metal disc and find the slope of the curve at steady temperature of lower disc. Why the value of this slope is taken from cooling graph, although the experiment is done, heating the lower disc? 4+2+2

e) Is it possible to determine the coefficient of thermal conductivity of the material of a **good** conductor by Lee and Charlton's disc method 5

3. a)Write down the formula for determining the resistance per unit length (ρ) of the material of the wire of a Carey Foster bridge .Make a table for determining the value of this ρ. 2+8

b) Write down the formula for determining the unknown resistance (R_t) by Carey Foster bridge .Make a table for determining the value of this unknown resistance (R_t) at two different temperatures. 2+8

c) Write down necessary theory for determining the temperature co efficient of resistance of the material of a given wire by using a Carey Foster bridge 5

d) Draw the necessary circuit diagram for determining the temperature co efficient of resistance of the material of a given wire by using a Carey Foster bridge 5

4. a) Write down necessary working formula for drawing calibration curve of a thermocouple by direct measurement of the thermo - e.m.f using potentiometer. 8

b) Make a table for drawing calibration curve of a thermocouple by direct measurement of the thermo - e.m.f using potentiometer. 8

c) Draw the necessary circuit diagram for drawing calibration curve of a thermocouple by direct measurement of the thermo - e.m.f using potentiometer. 8

d) You are measuring null points each time in this experiment that is no current through the galvanometer yet current flows in the potentiometer giving rise to potential drop. Explain with circuit diagram the path of the current at the null condition of the galvanometer. 6