# COVENANT UNIVERSITY

## COLLEGE OF SCIENCE AND TECHNOLOGY

## DEPARTMENT OF PHYSICS

## 2022/2023 SESSION

## PHY119 PRACTICAL

A. EXPERIMENT 1:

In a heat experiment, a mass of copper 40g was heated to a temperature T1$^{o}$C and then quickly transferred into container well lagged containing 240g of water at a room temperature $\theta_o{}^{o}$C. The mixture is stirred uniformly to attain a final temperature $\theta_1{}^{o}$C. By using the same mass of water with same initial temperature of $\theta_o{}^{o}$C, the experimental procedure is repeated five additional times with the same copper block heated to temperatures $T_2$, $T_3$, …, $T_6{}^{o}$C while the corresponding final temperatures obtained for the mixture $\theta_2$, $\theta_3$,…, $\theta_6{}^{o}$C are recorded. Results obtained are tabulated as shown;

Room temperature observed $\theta_o$ = 32.5$^{o}$C

| S/N | Temp. of metal T, ($^{o}$C) | Final Temp. of mixture, $\theta$ ($^{o}$C) | $\theta - \theta_o$ ($^{o}$C) | $T - \theta_o$ ($^{o}$C) |
|---|---|---|---|---|
| 1 | 43.00 | 32.60 | 0.10 | 10.40 |
| 2 | 55.50 | 32.90 | 0.40 | 22.60 |
| 3 | 63.50 | 33.00 | 0.50 | 30.50 |
| 4 | 75.00 | 33.10 | 0.50 | 42.00 |
| 5 | 86.50 | 33.20 | 0.70 | 53.30 |
| 6 | 98.00 | 33.30 | 0.80 | 64.7 |

Plot a graph of ($\theta$-$\theta_o$) against (T-$\theta_o$). Determine the slope of your graph

QUESTIONS

1. State two precautions you would take in laboratory performing this experiment to obtain best results.

2. Define the term specific heat capacity.

3. What is the difference between heat capacity and specific heat capacity of a material?

B. EXPERIMENT 2: (LIGHT)

In a given experimental arrangement for light, a circular hole represents an illuminated object of diameter $d_i$ placed at a distance U from a converging lens. To obtain the image distance V, the position of the screen from the lens is adjusted. The distances of U,V, and diameter $d_i$ were measured and recorded. The varying object distance, U, image distance, V, and diameter $d_i$ of the illuminated circular hole for six different instances were measured and recorded. For each of the instances, the magnifications, M were determined. Results obtained are tabulated below;

Actual diameter of object do = 2.80 cm

| S/N | U (cm) | V (cm) | $d_i$ (cm) | M (cm) |
|---|---|---|---|---|
| 1 | 10.00 | 19.50 | 2.20 | 0.786 |
| 2 | 12.00 | 24.10 | 2.70 | 0.964 |
| 3 | 14.00 | 28.50 | 3.20 | 1.143 |
| 4 | 16.00 | 32.00 | 3.60 | 1.286 |
| 5 | 18.00 | 36.50 | 4.20 | 1.500 |
| 6 | 20.00 | 40.00 | 5.10 | 1.821 |

Plot a graph of M on the vertical axis and V on the horizontal axis and determine the slope of the graph, and from your graph, determine the value of M when V= 0.

QUESTIONS

1. State two (2) precautions you would consider if you were performing this experiment in the laboratory.

2. Suppose the object and image distances with respect to the lens are 17 cm and V cm. If the focal length is 10 cm, determine the image distance.