PHSA SEM 3 CC7 PRACTICAL - 2022

F.M: 30

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

1. a) Write down the theory for verification of Stefan's law using torch bulb 8

b) Draw the circuit diagram for verification of Stefan's law 5

c) Draw the nature of the calibration curve of a torch bulb filament (R_t/R_d vs. T graph) 3

d) Draw a graph by plotting $\log_{10}$ T along x-axis and $\log_{10}$ P along Y-axis and find the slope of the curve at higher temperature. Why the value of this slope is never exactly 4?

5+2+2

e) Make a table for taking data for filament temperature and corresponding power dissipation

5

2. a) What is Planck's constant? What is LED? 1+2

b) Draw the circuit diagram for determination of Planck's constant using LED. 4

c) Draw the I- V characteristics of LED. Explain how wavelength of emitted radiation is related to minimum voltage (V_0) required to emit a photon from LED. How this minimum voltage required to emit a photon from LED is obtained from the I- V characteristics of LED?

5+5+2

d) How can you get different λ and corresponding different turn on voltages for plotting $V_0 - \lambda^{-1}$ graph. Plot the nature of graph $V_0 - \lambda^{-1}$. How from this graph you can find the Planck constant

1+5+5

3. a)What is tunnel effect and what is tunnel diode? 5+5

b) Draw the circuit diagram for drawing I-V characteristics of a tunnel diode 5

c) Make a table for taking data for drawing I-V characteristics of a tunnel diode 10

d) Draw the nature of I-V characteristics of a tunnel diode . What is negative resistance?3+2