Course: Principles of Physics II (Physics 112)

Time:20min

Sec: Name: ID:

(Answer any 5 questions)

1. a) What is the end correction of a meter bridge? 1

   b) Suppose the values of end corrections x and y of a meter bridge are respectively 1 cm and –0.5 cm. How will you use these values in your experiment? 2

2. a) Draw a circuit with four resistances and explain the Wheatstone bridge principle. 1.5

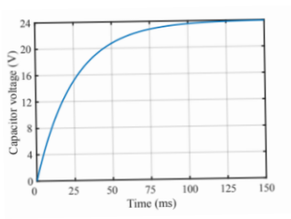
   b) What is specific resistance? Write down the factors on which specific resistance is dependent 1.5

3. a) Why do you use shunt when determining the resistance of a galvanometer? Will you prefer a low or high resistance of a shunt? 1

   b) Draw the circuit for determining resistance of a galvanometer. Explain the importance of the resistances in the circuit except shunt 2

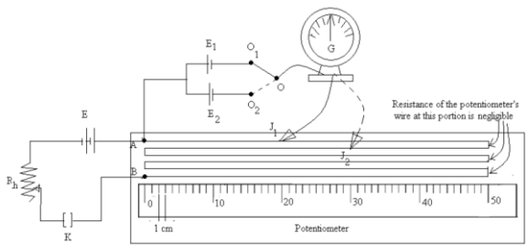
4. a) What do you understand by the term time constant of an RC circuit? 1.5

   b) Below is a graph of capacitor voltage vs time of a RC circuit while charging. Calculate the time constants of this RC circuit. 1.5



5. a) What is EMF of a cell? Draw a circuit and explain EMF. 1.5

b) See the figure below which shows the circuit construction to compare the emf of two cells with a potentiometer. When OO_1 is connected then the null point of the galvanometer is found at J_1. When OO_2 is connected then the null point of the galvanometer is found at J_2. What is the approximate of E_1/E_2 ? 1.5



6. a) Draw an appropriate circuit and explain voltage divider rule. 1

b) We can use a voltmeter/multi-meter and a resistance box to measure the internal resistance of a cell. What might be a drawback of using a voltmeter or a multi-meter for this purpose? How can a potentiometer be useful to avoid this drawback? 2

7. a) What is the mechanical equivalent of heat? 1

b) Why is it important to make radiation correction in determining mechanical equivalent of heat? 2

8. a) What is the time base of an oscilloscope? 1

b) What is Lissajous curve? From the below Lissajous curve determine T_x /T_y? 2