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**NATIONAL OPEN UNIVERSITY OF NIGERIA**

**PLOT 91, CADASTRAL ZONE, NNAMDI AZIKIWE EXPRESSWAY, JABI - ABUJA**

**FACULTY OF SCIENCES**

**DEPARTMENT OF PURE AND APPLIED SCIENCE**

 **2018\_2 SEMESTER EXAMINATION**

**COURSE CODE: PHY 391**

**COURSE TITLE: PHYSICS LABORATORY II**

**CREDIT UNIT 2**

**TIME ALLOWED (2 HRS)**

**INSTRUCTION: *Answer question 1 and any other three questions***

**QUESTION 1**

To investigate the value of a resistor in parallel connections, the following observations were made:

|  |  |  |  |
| --- | --- | --- | --- |
| S/N | R Ω | I (A) | V (v) |
| 1 | 2.0 | 0.90 | 1.10 |
| 2 | 3.0 | 0.80 | 1.20 |
| 3 | 4.0 | 0.75 | 1.30 |
| 4 | 5.0 | 0.70 | 1.40 |
| 5 | 7.0 | 0.65 | 1.50 |
| 6 | 10.0 | 0.60 | 1.60 |

1. Evaluate $R^{-1}$ and y $=\frac{1}{V}$ and, tabulate your readings. (7 marks)
2. Ploy a graph with y on the vertical axis and $R^{-1}$ on the horizontal axis. (6 marks)
3. Determine the (i) slope of the graph. (2 marks)

 (ii) Intercept on the vertical axis. (2 marks)

1. Calculate the error in the slope. (2 marks)
2. Given the expression : $\frac{I}{V}=\frac{1}{R}+\frac{1}{S}$

where S is the resistance of the resistor connected in parallel with R. Deduce the value of S from your graph. (2 marks)

1. State two sources of error and how to prevent them. (4 marks)

**QUESTION 2**

(a) State Kirchhoff’s first law **3marks**

(b)Distinguish between metals, semiconductors and insulators in terms of energy gap

 **6 marks**

(c) List two examples each of metals, semiconductors and insulators that you are familiar

 with. **6 marks**

**QUESTION 3**

 (a)Mention 4 necessary precautions to be taken when measuring voltage by multimeters

 **4 marks**

 (b)Mention 3 instruments that serve as amplifier **3 marks**

 **(c)** State the equations for gain of inverting configuration amplifier and gain of

 non-inverting configuration amplifier. **4 marks**

 (d) Given that RR=2.5KΩ and RF=10kΩ, What is the gain of the inverting configuration

 amplifier? **4 marks**

**QUESTION 4**

 (a)Mention four classification of operational amplifier **4 marks**

(b)Differentiate between converging lens and diverging lens **4 marks**

(c)Mention the necessary precaution in handling lenses **4 marks**

(d)What is meant by standardization of the grating? **3 marks**

**QUESTION 5**

(a) What is an electrical network? **3 marks**

(b) What is a linear element? **3 marks**

(c) Mention two examples of active devices **2 marks**

(d) Mention two examples passive of elements. **2 marks**

(e) Differentiate between passive network and active network **5 marks**