**Name:…………………………………….....................ADM No:………......Class:……....**

**488/2**

**ELECTRICITY**

**PAPER 2**

**DECEMBER 2021**

$2\frac{1}{2}hours$

**MECS CLUSTER JOINT EXAMINATION**

**FORM FOUR END OF THE TERM TWO EXAMINATION 2021**

**ELECTRICITY**

**INSTRUCTIONS TO CANDIDATES**

1. Write your name, index number and class in the spaces provided above.
2. The paper contains **7 PRINTED** pages make sure all **PAGES ARE PRINTED** and **NON IS MISSING**
3. Non-programmable silent electronic calculators are allowed for use
4. This paper consists of **5 EXERCISES**
5. Each exercise should be done in **30 MINUTES**

**For examiner use only**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **EXERCISE 1** | **EXERCISE 2** | **EXERCISE 3**  | **EXERCISE 4** | **EXERCISE 5** |
|  |  |  |  |  |

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| --- |
|  |

 **GRAND TOTAL**

**EXERCISE 1**

Using the components, materials and equipment provided, perform the following tasks

1. Connect the figure as shown below. Let the examiner check your work (6 marks)



1. Close the switch. Adjust the potentiometer to obtain voltage reading shown in the table below. For each voltage obtained, measure and record the corresponding current values

 (5 marks)

1. Plot a graph of current against voltage. (6 marks)



1. From the graph:
2. Determine the resistance when the voltage is 1.3V
3. Give a reason for the shape of the graph

 (3 marks)

**EXERCISE 2**

Using the components, materials and equipment provided, carry out the following tasks:

1. Connect the circuit as shown in the figure below



Let the examiner check your work. (5 marks)

1. Adjust Vcc to the values shown in the table below and for each voltage value measure and record the corresponding value of the collector current, Ic

 (6 marks)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Vcc | 9 | 7 | 5 | 3 | 1 | 0.5 |
| Ic (mA) |  |  |  |  |  |  |

1. Repeat step in (b) above for the values shown in the table below and complete the table

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Vcc (V) | 10 | 8 | 6 | 4 | 2 | 0.5 |
| Ic (mA) |  |  |  |  |  |  |

1. From the results obtained in (b) and (c) above, make two comments about the collector current Ic. (4 marks)
2. State **two** factors that determine the value of collector current (2 marks)

**EXERCISE 3**

Using the tools, materials and equipment provided, carry out the following tasks:

1. Terminate the three-core flexible cable to the top plug and iron box (15 marks)
2. Turn the thermostat switch to ON position, measure and record the values of resistance between;
3. Live and Neutral at plug………Ohms
4. Live and earth at plug………...Ohms
5. Earth at plug and iron box body……..Ohms
6. Neutral at plug and at iron box……….Ohms

 (5 marks)

**EXERCISE 4**

Using the tools, material and equipment provided, fabricate the stand as shown in the figure below. (20 marks)



**EXERCISE 5**

The figure below shows the layout of a final circuit. Using PVC sheathed cables, install the lamps to controlled by one-way switch (20 marks)

