Name………………………………………..ADM No……………. Class………………..

**448/1**

**ELECTRICITY**

**Paper 2**

**(PRACTICAL)**

**MAY 2023**

**Time: 2 ½ hours**

**MECS CLUSTER JOINT EXAMINATION**

**FORM FOUR TERM ONE EXAMINATION 2023**

**ELECTRICITY**

**Instructions To Candidates**

*1. There are* ***FOUR*** *exercises in this paper*

*2. Candidates are allowed* ***30 minutes*** *for each exercise*

*3. Each exercise will be awarded a maximum of* ***20 marks***

*4. Write your* ***Name*** *and* ***Index number*** *at the top of this page*

*5. Do NOT do work related to other stations while at a different station*

*6. Attempt* ***All*** *the exercises as directed by the examiner(s)*

 **For Examiner’s Use Only**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Exercise** |  **1** |  **2** |  **3** |  **4** | **Total** |
| **Total Marks** | **20** | **20** | **20** | **20** | **80** |
| **Marks Scored** |  |  |  |  |  |
|  |

*This paper consists of* ***6 printed pages****. Candidates should confirm that all the pages are printed as indicated and that no questions are missing.*

**EXERCISE 1 (20mks)**

40

80

20

40

50

20

40

40

(a) Pictorial view

Two soldered flap joints

5mm wide cut at 45o

Two ø 3mm holes

(b) Development

**EXERCISE 2: (20mks)**

The figure below shows the isometric view of a metal bracket. Study the drawing carefully. The **bold arrow** indicates the front view of the bracket.

 

F

On the plain paper provided, draw the following **third angle orthographic** views of the guide:

1. The Front elevation
2. The End elevation
3. The Plan view

Label the views and indicate six main dimensions on the drawing

**Solution-3mks borderline-2mks Dimensioning-4mks**

**Accuracy-3 mks neatness-2 mks**

**Outline-3mks labeling- 3mks**

**EXERCISE 3: (20mks)**

The figure below shows a Zener diode testing circuit

milliammeterr

 R 47Ω

 +ve ID

Power

Supply

Unit

 Voltmeter

 Dz VD

 -ve

 Switch

Use the equipment and components provided to carry out the following tasks:

(a) With the power OFF, set up the circuit as shown in the figure above. Let the examiner check your circuit before proceeding (5mks)

(b) Put ON the power and set the supply voltage, Vs to various values as shown in the table below. Record the corresponding values of the current through the diode, ID and the voltage across the diode, VD  (8mks)

|  |  |  |
| --- | --- | --- |
| Vs (v) | ID (mA) | VD (v) |
|  2 | ***0*** | ***1.6*** |
|  4 | ***0*** | ***4.0*** |
|  6 |  ***0*** | ***5.1*** |
|  8 | ***0*** | ***5.2*** |
|  10 | ***002*** | ***5.2*** |
|  12 | ***0.03*** | ***5.3*** |
|  14 | ***0.03*** | ***5.3*** |
|  16 | ***0.04*** | ***5.3*** |

(c) Reduce the supply voltage to zero and turn OFF the power supply

(d) Draw a graph of ID against VD on the graph paper provided please turn over(PTO) (4mks)

(e) From the graph, determine the voltage at which the Zener diode starts conducting significantly (1mk)

 VZ = ***5.2***

 (f) Give a practical application of the circuit tested above (2mks)

 ***Voltage regulation***

 ***Switching applications***



**EXERCISE 4: (20mks)**

The figure below shows the layout diagram of a lamp circuit carried out in p.v.c. insulated and sheathed cables.

Lamp

1-way Switch

Junction box

CCU

200

250

250

250

 (a) Install and wire the circuit such that the lamp is controlled by the one-way switch (17mks)

 (b) Name three types of tools and three types of accessories used in the exercise (3mks)

 ***(i) Hammer***

 ***(ii)Screw driver***

 ***(iii)side cutter***

 Accessories:

 ***(i)switch (ii)lamp holder (iii) pattress box (iv)junction box***