

**Candidate's Examination Number.....**

**SMZ**

**ZANZIBAR EXAMINATIONS COUNCIL**

**FORM THREE ENTRANCE EXAMINATION**

**053**

**ELECTRICAL ENGINEERING**

**TIME: 2:30 HOURS**

**MONDAY 08<sup>TH</sup> NOVEMBER, 2021 P.M**

**INSTRUCTIONS TO CANDIDATES**

1. This paper consists of THREE (3) sections A, B and C.
2. Answer ALL questions in section A, B and C.
3. All answers must be written in the space provided.
4. All working must be written in black or blue ink and diagrams must be in pencil.
5. Write your examination number on every page of the booklet.
6. Calculators, cellular phones and unauthorized materials are not allowed in the examination room.

<b>FOR EXAMINER'S USE ONLY</b>					
<b>Question number</b>	<b>Marks</b>	<b>Signature</b>	<b>Question number</b>	<b>Marks</b>	<b>Signature</b>
<b>1</b>			<b>6</b>		
<b>2</b>			<b>7</b>		
<b>3</b>			<b>8</b>		
<b>4</b>			<b>9</b>		
<b>5</b>			<b>10</b>		
<b>TOTAL</b>					

**This paper consists of 10 printed pages**

1. Choose the correct answer and write its letter below the item number in a given table.

i) The SI unit symbol for energy is

- A. E              B. J              C. V              D. W

ii) The prefix for mega is

- A. Mg              B. m              C. M              D. ma

iii) 0.005Watts may be expressed as

- A. 5 $\mu$ W              B. 5MW              C. 5KW              D. 5mW

iv) Which of the item below is not an accessory?

- A. Ceilling rose              B. Luminaire  
C. Lamp holder              D. Socket outlet

v) The abbreviation PVC refers to

- A. Polychlorophene              B. Polyvinyl chloride  
C. Protective varnish cream              D. Polyethylene rubber

vi) Which fire extinguisher below should not be used on electrical fire?

- A. Carbon dioxide              B. Dry powder  
C. Foam              D. Vaporizing liquid

vii) All phases of a 3 core flexible cable should be coloured

- A . Black              B. Brown  
C. Orange              D. Red

viii) The unit of quantity of electricity or charge is called

- A. Ampere              B. Coulomb  
C. Farad              D. Watt

ix) Voltage in a circuit is found by using the formula

A.  $I \times R$

B.  $\frac{I}{R}$

C.  $I+R$

D.  $I - R$

x) An ammeter is used to measure current

A. Current

B. Energy


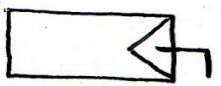



C. Power

D. Resistance

**Answers**

i	ii	iii	iv	v	vi	vii	viii	ix	x

2. Match the symbol in **COLUMN A** with the name of the symbol in **COLUMN B** by writing the letter of the correct response below the item number in a given table.

<b>COLUMN A</b>	<b>COLUMN B</b>
<p>i) </p> <p>ii) </p> <p>iii) </p> <p>iv) </p> <p>v) </p>	<p>A. Dimmer switch</p> <p>B. Two way switch</p> <p>C. Change over switch</p> <p>D. Electric bell</p> <p>E. Lighting point</p> <p>F. Two pole switch</p> <p>G. Socket outlet with pilot lamp</p> <p>H. Variable resistor</p>

**Answers**

i	ii	iii	iv	v

3. a) The term "fire" is popular to most electrical engineering experts.

i) Briefly explain the meaning of fire.

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ii) Analyse three (3) components of fire triangle.

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b) A cable has a total resistance of  $0.6\Omega$  when it carries a current of 60A.

Determine

i) The voltage drop in the cable

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ii) Power lost in the cable

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iii) The energy consumed over 24hrs

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4. a) One of the client came to your electrical workshop with his battery and ask you to charge it. Mention the three (3) common methods of battery charging.

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- b) A cell has an internal resistance of  $0.02\Omega$  and an e.m.f of 2V. Calculate its terminal p.d if it deliver

i) 5A

ii) 50A

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- c) What can you observe from your answers?

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5. a ) Express the following in terms of their numerical values. See Example below.

**Example:** Twenty four thousand milliamperes \_\_\_\_\_ 24,000mA.

i) Forty three megahom \_\_\_\_\_

ii) Four hundred and fifteen volt \_\_\_\_\_

iii) Fifty hertz \_\_\_\_\_

iv) Forty four millivolts \_\_\_\_\_

v) Eight two thousand and thirteen microwatt \_\_\_\_\_

6. a) During a practical session in an electrical workshop one of your fellow student got an electric shock. As an electrician explain the following.

i) Meaning of an electric shock

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ii) The four (4) immediate actions that you would take to help the victim.

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b) i) Define the term electrical accident.

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ii) State any four (4) measures to be taken in order to prevent electrical accidents at home.

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7. Draw a well diagram consisting of instruments used to measure current and voltage in an ac circuit supplying a lamp. In your diagram, include circuit protection and control.

8. a) Draw the line of forces of two magnets with a similar poles adjacent.

- b) A magnetic pole face has a rectangular section having dimensions 200mm by 10mm. if the total flux emerging from the pole is  $150\mu\text{Wb}$ . Calculate the flux density.

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9. Three capacitors of  $60\mu\text{F}$ ,  $40\mu\text{F}$  and  $24\mu\text{F}$  are connected in parallel across a  $500\text{V}$  supply. Calculate

i) The total capacitance

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ii) Total charge

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iii) Charge in each capacitor

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10. Students from XYZ Vocational Training Centre visited to your school for the purpose of learning safety signs used in working environment. Your headmaster appointed you to present the subtopic "safety sign used in working environment" to the students from XYZ Vocational Training Centre. In your presentation,

i) Explain the purpose of safety signs

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ii) Identify the four (4) categories of safety signs.

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iii) Sketch one (1) sign for each of the four categories

iv) State the message given by each sign.

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