Candidate's Examination Number.....

SMZ

ZANZIBAR EXAMINATIONS COUNCIL

FORM THREE ENTRANCE EXAMINATION

057 ELECTRICAL INSTALLATION

TIME 2:30 HOURS FRIDAY 1ST DECEMBER, 2017 PM

INSTRUCTIONS TO CANDIDATES

1. **This paper consists of sections A, B and C.**
2. **Answer ALL questions in sections A and B and any three (3) questions in section C.**
3. **All answers must be written in the space provided.**
4. **Write your examination number on every page of this booklet.**
5. **Calculators and cellular phones are not allowed in the examination room.**
6. **Use blue or black pen in writing. The diagrams must be drawn in a pencil.**

FOR EXAMINER'S USE ONLY					
QUESTION NUMBER	MARKS	SIGNATURE	QUESTION NUMBER	MARKS	SIGNATURE
1			9		
2			10		
3			11		
4			12		
5			13		
6			14		
7			15		
8					
TOTAL					

This paper consists of 15 printed pages.

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SECTION A :(10 Marks)

Answer ALL questions in this section

1. For each of the items (i) – (x) choose the correct answer and write its letter below the item number in the table provided at the end of this question.

i). Two bulbs marked 200 watt-250 volts and 100 watt-250 volts are joined in series to 250 volts supply. Power consumed in a circuit is

A. $33\ watt$ B. $67\ watt$ C. $100\ watt$ D. $300\ watt$.

ii) An insulator is a material that

A. Allow current to flow through it
B. Some time allow current to pass but some time do not
C. Store electric charges
D. Do not allow current to pass through it.

iii) Which item below is not an accessory?

A. Carbon B. Ceiling rose C. Socket outlet D. Switch

iv) The specific resistance of a material is called

A. Temperature coefficient of resistance B. Insulation

C. Conductivity D. Reluctance

v) A device that automatically control the main supply for a large heating circuit

A. Triple pole switch B. Double pole switch
C. Heavy fuse. D. Heat controller

vi) The standard unit for resistivity is

A. Ω B. Ωmm C. Ωm D. Am

vii) Which of the following statements is true

A. Electric current is measured in Volts

B. 200k **Ω** is equivalent to 0.2M Ω

C. An electrical insulator has high resistance

D. Electrical energy is measured in Watts

viii) Engineering students should understand the workshop safety rules in order to

A. Know workshop regulations

B. Be familiar with safety rule

C. Prevent accidents in a workshop

D. Keep workshop environment clean

ix) Is not a method of generating electric energy

A. Natural gas B. Geothermal

C. Electrolysis D. Nuclear.

x) Is not necessary during the process of soldering.

A. Soldering gun B. Solder

C. Electric switch D. Soldering flux

ANSWERS

Item number	i	ii	iii	iv	v	vi	vii	viii	ix	x

SECTION B: (30 Marks)
Answer ALL questions in this section.

2. A person standing on the general mass of earth touches a phase conductor on a 240V supply. If the resistance of the circuit is 48KΩ which is mainly his body resistance, calculate the current flowing through his body.

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3. Calculate the maximum allowable voltage drop of the following supplies,

   i) 415V

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   ii) 132KV

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   iii) 240 V.

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4. The most widely used system is 3-phase 4 wire, why?

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5. a) Define a switch.

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b) Name three types of switches that are commonly used in domestic lighting circuits.

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6. What do the following abbreviations stand for?

i) PVC

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ii) trs

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iii) SPN

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7. a) Define the term cable.

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b) Identify three (3) main parts of a cable.

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8. a) Name three (3) types of electrical diagrams.

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b) With examples, define the term "accessory".

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9. a) State the function of each of the following devices.

i) Circuit breaker

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ii) Switch.

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b) Name any two (2) characteristics of a series circuit.

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10. a) Name the type of switch suitable for controlling the light from two different positions.

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b) How many switches are required to control light from two different positions?

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11. a) List down two (2) common insulating materials.

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b) Sketches the symbol of

i) Earth

ii) Battery

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SECTION C: (60 Marks)

Answer any three (3) questions from this section.

12. a) Design a circuit which may be used to control two lamps from three different positions.

b) Briefly explain the following types of circuits.

i) One way- switching circuit

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ii) Two ways- switching circuit

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iii) Two ways- switch with intermediate switching circuit.

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13. Draw a well labeled diagram of a supply transformer which is suitable for factories and private houses.

14 a) What is the temperature coefficient of a material?

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b) i) The resistance of coil of a copper wire at 0°C is 10Ω.Calculate the resistance of the same wire at 30°C. $\propto = 0.004\Omega/\Omega^0C$

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ii) The field coil of a motor has resistance of 200Ω at 20°C. What will be the resistance at 40°C?

15. a) Give three differences between Ammeter and Voltmeter.

b) With the aid of diagram, explain the method which is used to determine the ohmic value of a particular component using an Ammeter and Voltmeter which are connected in a circuit.