Candidate's Examination Number.....

SMZ

ZANZIBAR EXAMINATIONS COUNCIL

FORM THREE ENTRANCE EXAMINATION

051 RADIO AND TV SERVICING

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

INSTRUCTIONS TO CANDIDATES

1. **This paper consists of THREE 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 a 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). A 150MF capacitor has been charged to a potential difference of 100V. A 50Ω resistor is placed across a capacitor. After 20s time constant then total energy delivered to the resistor is most nearly.

   A. 1.5J B. 0J
   C. 0.75J D. $15x10^{-3}$J

   ii) Digital instruments are those which:

   A. Have numerical readout. B. Use LED or LCD display..
   C. Have a circuitry of digital design. D. Use deflection type meter instrument..

   iii) Multimeter is used to measure

   A. Resistance B. Current
   C. Voltage D. All of the above.

   iv) A capacitor that store charge of 0.5C at 10V has a capacitance of:

   A. 5 Farad B. 20 Farad
   C. 10 Farad D. 0.05 Farad

   v) Which of the following is a unit of charge?

   A. A/s B. As
   C. C/s D. V/A

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vi) A current of 500mA is set up in a conductor for 20s.The charge which entered conductor was

A. $\frac{1}{25}$C B. 25C

C. 10C D. 40C

vii) A transformer is a device for

A. Changing alternating voltage

B. Changing direct voltage

C. Changing ac to dc

D. Increasing electrical energy.

Viii) Donor type semiconductor is formed by adding impurity of valence

A. 3 B. 4

C. 5 D. 6

ix) A cut in voltage for Si diode is approximately

A. 0.2V B. 0.6V

C. 1.1V D. Any other.

x) Holes may be considered as

A Pure conductor B. Intrinsic semiconductor

C. Positive charge D. Negative charge.

ANSWERS

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

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SECTION B: (30 Marks)

Answer ALL questions in this section.

2: a) Write down the two (2) popular semiconductor materials.

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_____

_____

b) What is the difference between intrinsic semiconductor and extrinsic semiconductor?

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3: a) In what unit a capacitance of a capacitor can be expressed?

_____

b) Name any three (3) types of capacitors.

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_____

4: a) Write down the resistance value of an ideal diode in the region of conduction.

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_____

b) Calculate I_D if R_D =30Ω and V_D = 0.84V where I_D, R_D and V_D are diode current, diode resistance and diode voltage respectively.

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_____

_____

_____ _____

5: Draw the symbols of the following electronic components,

i) LED.

(ii) Step up transformer.

iii) Tunnel diode.

(iv) Variable capacitor.

6: State the application of the following:

i) Ammeter

_____

_____

ii) Voltmeter

_____

_____ iii) Ohmmeter

_____

_____

7: Determine the resistance value of the resistors with the following color codes

i) Green, blue, red (with silver tolerance)

_____

_____

_____

ii) Blue, Brown, White, Brown, Red tolerance

_____

_____

_____

_____

8: List down any three (3) workshop safety rules.

_____

_____

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_____

9: Convert the following,

i) 20kΩ in to Ω

ii) 3mA in to A

iii) 1μH in to H

10: a) State ohm's law.

b) Use a simple circuit diagram to show the connection of an Ammeter in to an electric circuit.

11: a) List down any three (3) passive components.

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b) Give two (2) examples of dielectric materials.

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SECTION C: (60 Marks)

Answer any three (3) questions in this section.

12: a) Identify five (5) main parts of soldering iron.

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b) Give two (2) examples of soldering materials.

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c) Write down a tool that can be used to

i) Cut the wire inside the heart of the circuit jumble.

_____

_____

ii) Test the presence of voltage at any point.

_____

_____-_____

iii) Remove insulation from the wire.

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_____

d) Give three (3) differences between PN junction diode and photodiodes.

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13. Study the figure 1 below carefully and then answer the questions that follow

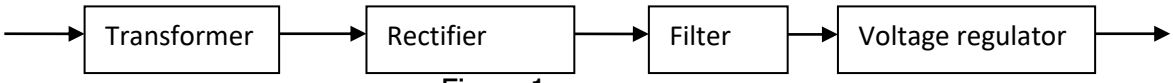

Figure1

a) Write down the name for figure 1.

_____

_____

b) Sketch the output waveform for each stage of fig 1.

c) Identify the electronic component(s) used in each stage of figure 1.

d) What will happen if the last stage of figure 1 is removed?

14: a) Identify necessary conditions for a normal rectifier diode to operate.

b) i) Write down any two (2) advantages of a half wave rectifier.

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_____

_____

_____

ii) Name the two (2) disadvantages of using a half wave rectifier.

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c) A rectifier diode is connected to a 250V, 50Hz A.C supply via a step down transformer having turns ratio of 2:1. If VB_E = 0.7V and R_L is the load resistance. Use the given information to:

i) Draw a half wave rectifier circuit.

ii) Determine the peak value of the rectified output.

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15: a) State the bias condition that produce a widening depletion layer.

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b) With no incident light, a certain amount of reverse current flows in a photo diode. Give the name of this current.

_____

_____

c) Distinguish between rectifier and rectification.

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_____

d) Draw the output waveform of a full wave rectifier.

e) Two $10\mu F$ capacitors in parallel are connected in series with a $5\ \mu F$ capacitor. Determine the total circuit capacitance.

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