Student's Assessment Number.....

THE UNITED REPUBLIC OF TANZANIA

NATIONAL EXAMINATIONS COUNCIL OF TANZANIA

FORM TWO NATIONAL ASSESSMENT

080 ELECTRICAL ENGINEERING

Time: 2:30 Hours **Year: 2022**

Instructions

1. This paper consists of sections **A, B** and **C** with a total of **ten (10)** questions**.**
2. Answer **all** questions.
3. Section **A** and **C** carry **fifteen (15)** marks each, section **B** carries **seventy (70)** marks.
4. Cellular phones and any unathorized materials are **not** allowed in the assessmenmt room.
5. Write your **Assessment Number** at the top right hand corner of every page.

FOR ASSESSOR'S USE ONLY		
QUESTION NUMBER	**SCORE**	**ASSESSOR'S INITIALS**
1		
2		
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TOTAL		
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SECTION A (15 Marks)

Answer **all** questions in this section

1. Choose the correct answer from the given alternatives by writing its letter in the box provided.

(i) Among other types, Juma decided to buy a lead-acid battery for his car. Why do you think he preferred a lead-acid battery and not an alkaline battery?

A. It is cheaper.

B. It has longer life.

C. It is very lighter.

D. It is mechanically strong

(ii) You are provided with the following appliances to install in a house: heater, cooker and washing machine. Why is it advised to connect the electrical appliances parallel in a circuit?

A. They depend on each other.

B. They draw less current.

C. They draw high current.

D. They operate independently.

(iii) A teacher ordered you to bring a first aid box after an accident occurred at the field. How would you identify the box?

A. A white cross on a green background.

B. A red cross on a white background.

C. A white cross on a black background.

D. A green cross on a white background.

(iv) Suppose you are required to draw an object in its actual size. What is the appropriate name for the scale required to draw the object?

A. A double scale.

B. Magnified scale.

C. Enlarge scale.

D. Full scale.

(v) Suppose you got an electric shock when you touched the metallic part of an electric iron. What kind of electric shock is that?

A. Fuse blown.

B. Earth leakage.

C. Short circuit.

D. Open circuit.

(vi) You are required to measure a very high frequency but small current. Which instrument will you use?

A. Thermocouple.

B. Electrodynamics ammeter.

C. Moving coil galvanometer.

D. Open circuit.

(vii) How can you determine the presence of magnetic field in a material?

A. By detecting the lines of magnetic flux.

B. By noticing the deflection of a magnetic compass needle.

C. By heating the surrounding air.

D. By touching magnetically affected area.

(viii) Which of the following is the unit of inductance?

A. Ohm

B. Mho

C. Farad

D. Henry

E.

(ix) A worker got a strain after lifting a load by using a ladder. What could be the possible cause of the strain?

A. The load was heavy.

B. The worker used a broken ladder.

C. The angle of the ladder was not reasonable.

D. The worker did not lift the load in a correct way.

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(x) A client is looking for a person who will produce specifications which will enable him to estimate the cost of the project. Who will you advice the client to call upon?

A. Cost engineer. C. Contract engineer

B. Design engineer. D. Project engineer.

2. match the description of responsibilities in List A with the corresponding occupation in List B by writing the letter of the correct response below the item number in the table provided.

LIST A	LIST B
i) A person responsible for producing the design specifications which enable the cost estimate of the project. ii) The leader of a small team e.g electricians and trainees. iii) A person responsible for carrying out testing, inspections and commissioning of electrical installation survey drawings. iv) A person responsible for a number of large electrical jobs of different sites. v) An electrician who is responsible for the whole plant.	A. Foreman B. Skilled operator C. Service manager D. Project manager E. Engineer F. Technician G. Craftsman H. Contractor

ANSWERS:

List A	**(i)**	**(ii)**	**(iii)**	**(iv)**	**(v)**
List B					

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SECTION B (70 Marks)

Answer **all** questions from this section

3. (a) You are supplied with three cells each with an e.m.f. of 1.5.V and an internal resistance of 1 Ω to light a touch. Draw a circuit diagram which shows the connection of the cells so that it can produce:

(i) A voltage more than 1.5 V.

(ii) A total voltage of 1.5 V.

(b) Find a total internal resistance of the cell in part (a) (i) and (ii).

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4. You are given a practical assignment which has two parts. The first part is to construct a circuit with capacitors C1 and C2 connected in series. The second part is to construct a circuit with inductors L1 and L2 connected in series.

    a) Draw the circuits to be used for the practical work.

    b) When C1 and C2 are 10 μF and 20 μF respectively, calculate the equivalent capacitance.

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c) When L1 and L2 are 17.6 H and 13.4 H respectively, determine the equivalent inductance.

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5. (a) Draw and give the applications of the following lines used in engineering field:

(i) Continuous thin line with zigzag.

(ii) Thin free hand continuous line.

(iii) Continuous thick line.

(b) Explain the use of the following essential items in electrical draughting:

(i) Grid paper

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(ii) Pencil

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(iii) Tee square

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(iv) Drawing board

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6. (a) A 100 V with a resistance of 250 Ω is used to illuminate girls' dormitory. The lamp is working for 24 hours a day. Determine:

(i) The current taken by the lamp.

(ii) The related power of the lamp.

(iii) The daily electrical energy consumed.

(b) Differentiate between electrical quantities in (a)(ii) and (a)(iii)

7. (a) Explain the principles used in the operation of the following instruments:

(i) Moving iron instruments

(ii) Moving coil instruments

(b) Examine six advantages of permanent magnet moving coil instruments.

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(ii) .....

(iii) .....

(iv) .....

(v) .....

(vi) .....

8. (a) Analyze three relationships between magnetic effect and electric current.

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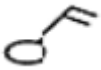
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(b) You are provided with two coils P and Q which are mutually coupled. The mutual inductance between two coils is 0.24 H and the current in the primary winding increases from 0.2A to 0.6 A in 10 msec. If the secondary coil Q is wound with 400 turns; determine:

(i) The Average value of e.m.f in the secondary winding.

(ii) Change in flux.

9. Suppose you are required to do wiring and you are provided with electrical drawings. Identify the following symbols found in electrical drawings provided and give the purpose of each symbol.

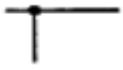
(i) 

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(ii)

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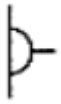
(iii) 

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(iv) 

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(v) 

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SECTION C (15 Mark)

Answer **all** questions from this section

10. Construct an isometric drawing of the object in full size from the given views. All dimensions were in mm, construction lines were not to be erased and all drawings were to be neatly shown.

