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BUGESERA DISTRICT

TSS 2nd TERM DISTRICT COMPREHENSIVE ASSESSMENT
SCHOOL YEAR: 2024-2025

SECTOR: Construction and Building Services

...../100 MARKS

TRADE: Building construction

RQF LEVEL: 3

MODULE CODE AND TITLE: DEMONSTRATE BASICS KNOWLEDGE OF DOMESTIC ELECTRICITY

MARKING GUIDE

DURATION: 3hours

DATE: / / 2025

INSTRUCTIONS TO CANDIDATE:

- ✓ This exam has three sections.
- ✓ Maximum marks...../100Marks
- ✓ Attempt all Questions in A
- ✓ Choose only two questions in section B.
- ✓ Choose only one question in section C.

TSS 2nd TERM DISTRICT COMPREHENSIVE ASSESSMENT
SCHOOL YEAR: 2024-2025

SECTION A: Attempt all questions

55 Marks

1.State whether the following statements is true or false:

5Marks

- a) Electricity: is the flow of molecules in a circuit from one place to another. **False**
- b) Electrons: can flow through any materials, but does so more easily in some than others. **True**
- c) Voltage: is like the pressure that pushes water through the hose and is measured in volts **True**
- d) A conductor: is a material that allows electrical resistance to oppose current to flow through it. **False**
- e) Electrical cable: is an assembly of one or more wires running side by side or bundled which is used to carry current. **True**

Bloom level, Understanding

Reference: LO.1. 1: PREPARE MATERIALS, TOOLS, EQUIPMENT AND PPE,

1.1. IDENTIFICATION OF ELECTRICAL MATERIALS

2. Choose the correct answer: the classifications of conductors according to the type of covering they have are:

2Marks

- A:** bare conductors, plastic conductors, PVC conductors
- B:** PVC and plastic, wood, wires, and cover of insulator
- C:** bare conductors, Single conductor and plastic cover conductors
- D:** metal cover, single conductors, cover of transmission cable and insulator conductor
- E: Bare conductor and insulated conductor**

Bloom level, Understanding

Reference: 1: PREPARE MATERIALS, TOOLS, EQUIPMENT AND PPE,

1.1. IDENTIFICATION OF ELECTRICAL MATERIALS

3. List down any four materials needed while an electrician is making a domestic installation.

2Marks

Answer: **An electrical switch, An electrical conductor, Electrical outlets , An electric light, lamp, or light bulb, Cable clips, Junction box, Switch box, fuse, circuit breaker, Scotch , Fastener,**

Bloom level, Understanding

Reference: 1: PREPARE MATERIALS, TOOLS, EQUIPMENT AND PPE,

1.1. IDENTIFICATION OF ELECTRICAL MATERIALS

4. a) Define the term earthing

1.5Mark

Answer: Is a safety system that protects people and equipment from electrical shock and damage.

b) Outlines two types of earthing

1.5Mark

Plate Earthing, Pipe Earthing, Rod Earthing, Earthing through the Waterman, Strip or Wire Earthing

Bloom level, Remembering

Reference: 2. APPLY BASIC DOMESTIC ELECTRICITY INSTALLATION

2.7. IDENTIFICATION OF ELECTRICAL MATERIALS

5. a) Define the term Safety

1Mark

Answer:

Safety: is the state of being safe or the condition of being protected against physical, social, emotional etc. or other types or consequences of failure, damages, error accidents or any other event which could be considered non-desirable. Or can be defined to be the control of recognized hazards to achieved an acceptable level of risk.

b) Outline four guidelines to be followed when working on equipment powered by electricity.

4Marks

Answer:

Follow these guidelines when working on equipment powered by electricity:

- **Read all warnings in Safety Warnings.**
- **Locate the emergency power-off switch for your installation location. If an electrical accident occurs, you can quickly turn off the power.**
- **Disconnect all power before doing the following: – Installing or removing a chassis**
- **Look carefully for possible hazards in your work area, such as moist floors, ungrounded power extension cables, frayed power cords, and missing safety grounds.**
- **Do not work alone if hazardous conditions exist.**
- **Never assume that power is disconnected from a circuit. Always check.**
- **Never open the enclosure of the router internal power supply.**

■ If an electrical accident occurs, proceed as follows: – Use caution; do not become a victim yourself. – Turn off power to the device. – If possible, send another person to get medical aid. Otherwise, assess the victim's condition and then call for help. – Determine if the person needs rescue breathing or external cardiac compressions; then take appropriate action.

Bloom level, Remembering

Reference: 2. APPLY BASIC DOMESTIC ELECTRICITY INSTALLATION

2.2. APPLY SAFETY RULES FOR WORKING WITH ELECTRICAL EQUIPMENT

6. What does it mean when Multimeter reads no continuity

2Marks

- a) no resistance in the circuit
- b) no capacitance connected in the circuit
- c) no inductance in the circuit
- d) somethings are breaking out
- e) there is a break somewhere in the circuit**

Bloom level, Understanding

Reference: LEARNING OUTCOME 3: PERFORM BASIC TESTING OF ELECTRICAL CIRCUITS, 3.1. 1. Identification of electrical instruments

7. Choose the correct answer:

2Marks

- a) Ohmmeter: is a amaterial
- b) Ohmmeter: is a matter
- c) Ohmmeter: is a tool
- d) Ohmmeter: is an object
- e) Ohmmeter: is an instrument**

Bloom level, Understanding

Reference: LEARNING OUTCOME 3: PERFORM BASIC TESTING OF ELECTRICAL CIRCUITS, 3.1. 1. Identification of electrical instruments

8. Write down the best definition that define voltmeter

2Marks

- a) Voltmeter is an electrical component that is used for measuring the drops in electrical wires.

- b) Voltmeter is an electrical object that is used for determining the type of electrical supply
- c) Voltmeter is both electrical and electronics apparatus and is used to measure.
- d) Voltmeter is an apparatus designed for regulating the voltage between the point of the circuit.
- e) Voltmeter is an electrical instrument used for measuring electrical potential difference between two points in an electrical circuit.**

Bloom level, Remembering

Reference: LEARNING OUTCOME 3: PERFORM BASIC TESTING OF ELECTRICAL CIRCUITS, 3.1. 1. Identification of electrical instruments

9. Write down the letter of correct arrangement for asked question:

A complete circuit is made up of:

5Marks

- a. circuit breaker, fuse, switchbox, lamp holder, and conductor
- b. wire, switch, covers and insulator, and protection devices
- c. fuse, wattmeter, voltmeter, electrical meter, conductors and switch gear
- d. power source, alternating current and voltage, wires, switch, control panel and switch
- e. electrical power supply, electrical conductors, protection devices, electrical control devices, electrical load appliances.**

Bloom level, Remembering

**Reference: Lo2. : APPLY BASIC DOMESTIC ELECTRICITY INSTALLATION 2,
1.1. DESCRIPTION OF ELECTRICAL CIRCUIT**

10. Write down the list contains the minimum precautions to observe when using Ammeter

Answer:

5Marks

Ammeters must always be connected in series with the circuit under test.

- **Always start with the highest range of an ammeter.**
- **De-energize and discharge the circuit completely before you connect or disconnect the ammeter.**
- **In dc ammeters, observe the proper circuit polarity to prevent the meter from being damaged.**
- **Never use a dc ammeter to measure ac.**

- **Observe the general safety precautions of electrical and electronic devices.**

Bloom level, Remembering

Reference: LO3. PERFORM BASIC TESTING OF ELECTRICAL CIRCUITS

11. How to use the following instrument during testing an electrical circuit **4Marks**

- a. Voltmeter
- b. Ammeter
- c. Wattmeter
- d. Ohmmeter

Answer:

- a. Voltmeter:** The voltmeter is connected in parallel with the circuit to be measured.
- b. Ammeter:** Connect a simple circuit so that the current will flow through the ammeter. Connect the positive probe of the ammeter to the positive terminal of the power supply. Connect the negative probe of the ammeter to one end of a resistor.
- c. Wattmeter:** connect the voltage terminals of the wattmeter in parallel with the load you want to measure, and connect the current terminals in series with the load.
- d. Ohmmeter:** In the simplest ohmmeters, the resistance to be measured may be connected to the instrument in parallel or in series. If in parallel (parallel ohmmeter), the instrument will draw more current as resistance increases. If in series (series ohmmeter), current will decrease as resistance rises.

Bloom level, Applying

Reference: LO3. PERFORM BASIC TESTING OF ELECTRICAL CIRCUITS

12. The list below is any one not a type of electrical installation? True or False **2Mark**

- i. flush mounted installation
- ii. surface mounted installation
- iii. half-imbedded installation **False**
- iv. Water Proof Installation

Bloom level, Remembering

Reference: Lo2. : APPLY BASIC DOMESTIC ELECTRICITY INSTALLATION

13. How many components makes a complete circuit? **2Mark**

- a) six main components
- b) three main components
- C) eight main component
- d) five main components**
- e) four main components

Bloom level, Remembering

Reference: Lo2. : APPLY BASIC DOMESTIC ELECTRICITY INSTALLATION

14. The current flowing through a resistor is 2 A when a potential difference is ten times the value Ampere given of V is applied. Determine the value of the resistance. Write down the letter of the answer. **2Marks**

- a. $8.2+2$
- b. 2×5^2
- c. 10^1**
- d. 10^2
- e. 10.1

Bloom level, Evaluating

Reference: LO2. APPLY BASIC DOMESTIC ELECTRICITY

15. A current of 4A flows in the winding of an electric motor, the resistance of the winding being 50. Determine (a) the p.d. across the winding, and (b) the power dissipated by the coil. **5Marks**

Answer:

- a) Potential difference across winding $V = IR = 4 \times 50 = 200 \text{ V}$**
- b) Power dissipated by coil, $P = I^2R = 4^2 \times 50 = 800 \text{ W or } 0.8 \text{ kW}$**

Bloom level, Applying

Reference: LO2. APPLY BASIC DOMESTIC ELECTRICITY

16. An electric kettle has a resistance of 30 . What current will flow when it is connected to a 240V supply? Find also the power rating of the kettle. **5Marks**

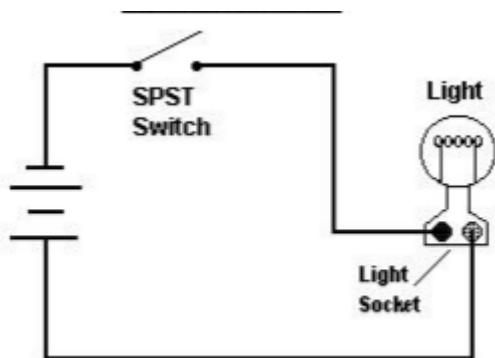
Answer:

**Current, $I = V / R = 240 / 30 = 8 \text{ A}$ Power, $P = VI = 240 \times 8 = 1920 \text{ W} = 1.92 \text{ kW} =$
power rating of kettle**

Bloom level, Applying

Reference: LO2. APPLY BASIC DOMESTIC ELECTRICITY

17. Look the picture below underline the correct function of the listed component: **2Marks**



- a) The switch will allow the passing of wires to reach junction box
- b) The lighting appliances are installed perpendicular to socket outlets
- c) **The wires connect all parts of the circuit together.**

Bloom level, Applying

Reference: LO2. APPLY BASIC DOMESTIC ELECTRICITY

SECTION B: Choose only three questions

30 Marks

18. Match the instrument with appropriate function:

10 Marks

S/N	INSTRUMENT	FUNCTION
1	Voltmeter	a. Measures current
2	Ammeter	b. Measures voltage
3	Multimeter	c. Used to measure the light
4	Wattmeter	d. Measures various quantity
5	A photometer	e. Measure power

Answer: 1=b, 2=a, 3=d, 4=e, 5=c (2Marks for each)

Bloom level, Analyzing

Reference: LO2. APPLY BASIC DOMESTIC ELECTRICITY

19. By saying true or false give the difference between the following electrical components:

i. Electrical bell produces a clear sound and uses a hammer to strike a metal bell, while buzzer create a continuous buzzing sound and vibrates internal contacts to generate sound. **True** /2Marks

ii. A resistor converts electrical energy when opposes electrical current while inductor stores electrical energy. **True** /2Marks

iii. One way switch is used to control lamp from one location while two way switch uses different places and time to control loads connected in series. **False** /2Marks

iv. push to make switch completes a circuit when pressed while push to break switch is a switch which breaks a circuit when pressed. **True** /2Marks

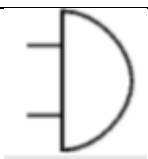
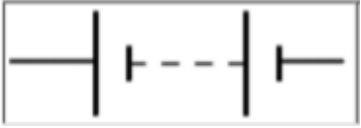
v. A circuit breaker automatically interrupts the current flow when an overload occurs while fuse breaks the circuit by melting a wire inside when too much current passes through. **True** /2Marks

Bloom level, Understanding

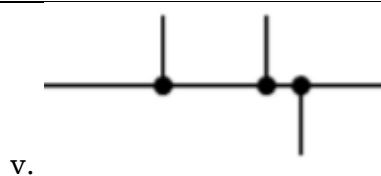
Reference: LO.1. PREPARE MATERIALS, TOOLS, EQUIPMENT AND PPE

20. Match the following:

10Marks

Electrical equipment	Electrical symbol
a) wire	i. 
b) battery	ii. 
c) Electric heater	iii. 
d) Wire joined	iv. 

e) Electrical bell



a=iii, b=iv, c=ii, d=v, e=i /2Marks for each

Bloom level, Understanding

Reference: LO.1. 2: IDENTIFICATION OF DOMESTIC ELECTRICAL SYMBOLS,

21. The following listed some of them are incorrect according to the question asked, write down the letter of false listed.

i. There are many causes of accident some of them are:

A: unawareness of danger

B: planning and arrangement of maintenance

C: always wear boot shoots

/2.5Marks

D: improper use of tools

E: unsafe condition

Bloom level, Understanding

Reference: LO.2: APPLY BASIC DOMESTIC ELECTRICITY INSTALLATION

2.1. IDENTIFICATION OF ELECTRICAL HAZARDS

ii. There are four signs of basic safety categories:

A: Prohibition sign: shape is semi or half circular

/2.5Marks

B: Mandatory sign: the colour is white symbol on a blue background

C: Warning sign: warns of hazard danger

D: Information sign: its symbol is characterized by green colour and white symbol

iii. Electric shock will depend on the following factors:

A: the age of person

B: type of supply

C: healthy condition

D: whether male or female

/2.5Marks

E: wearing or not wearing wet foot wear

iv. What to do if a person receives electrical shock?

A) Do not waste time

/2.5Marks

- B)** Switch off the power
 - C)** Make the patient lie down and rest.
 - D)** Apply pressure to the wound.
 - E)** Remove the victim from the contact with live conductor
- v.** The effect of electric shock are listed below:

A) Severe bleeding

B) Wound bleeding

2.5Marks

C) electric burn

Bloom level, Understanding

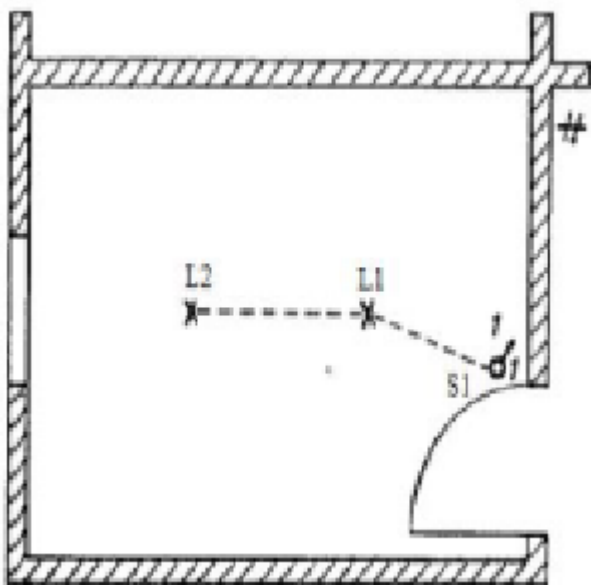
Reference: LO.2: APPLY BASIC DOMESTIC ELECTRICITY INSTALLATION

2.1. IDENTIFICATION OF ELECTRICAL HAZARDS

- 22. a)** Draw an architectural diagram of a house of one room, two lamps controlled by one way switch
- b)** Draw a Schematic diagram one lamp controlled by one way switch, and one socket outlet

Answer:

a)

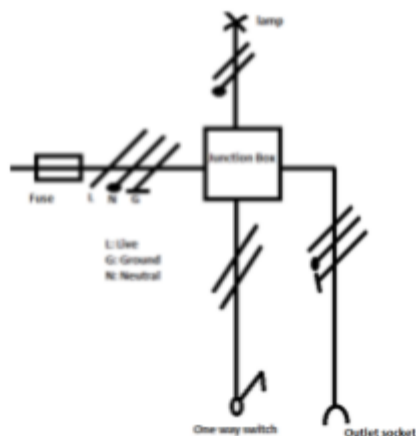


L1, L2: are lamps, S1: one way switch

/5Marks

b)

/5Marks



Bloom level, Creating

Reference: LO.2. APPLY BASIC DOMESTIC ELECTRICITY INSTALLATION

SECTION C: Choose only one question

15 Marks

23.

a) Give and state Ohm's law

Answer:

/5Marks

Ohm's law states that "the current I flowing in a circuit is directly proportional to the applied voltage V and inversely proportional to the resistance R, provided the temperature remains constant."

/2.5Marks

$$I = \frac{V}{R}$$

/2.5Marks

b) The current flowing through a resistor is 0.8 A when a p.d. of 20 V is applied. Determine the value of the resistance.

/5Marks

Answer:

From Ohm's law, resistance $R = \frac{V}{I} = \frac{20}{0.8} = \frac{200}{8} = 25 \Omega$

c) A 100 V battery is connected across a resistor and causes a current of 5 mA to flow. Determine the resistance of the resistor. If the voltage is now reduced to 25 V, what will be the new value of the current flowing? **/5Marks**

Answer:

$$\text{Resistance } R = \frac{V}{I} = \frac{100}{5 \times 10^{-3}} = \frac{100 \times 10^3}{5} = 20 \times 10^3 = 20 \text{ k}\Omega$$

Current when voltage is reduced to 25 V,

$$I = \frac{V}{R} = \frac{25}{20 \times 10^3} = \frac{25}{20} \times 10^{-3} = 1.25 \text{ mA}$$

Bloom level, Applying

Reference: LO.2. APPLY BASIC DOMESTIC ELECTRICITY INSTALLATION

24. Look the indicated pictures below and rename them respectively :

Answer: The pictures stands for Personal protective equipment for a worker. /1Mark



1. Goggles **/2Mark**
2. Ear muff **/2Mark**
3. Gloves **/2Mark**
4. Helmet **/2Mark**
5. Knee pad **/2Mark**
6. Jacket **/2Mark**
7. Safety shoes **/2Mark**