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(University of Choice)

MASINDE MULIRO UNIVERSITY OF SCIENCE AND TECHNOLOGY (MMUST)

MAIN CAMPUS

UNIVERSITY EXAMINATIONS 2023/2024 ACADEMIC YEAR

THIRD YEAR SECOND SEMESTER SPECIAL/SUPPLEMENTARY EXAMINATIONS

FOR THE DEGREE OF BACHELOR OF TECHNOLOGY EDUCATION IN ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE CODE: TEE 324

COURSE TITLE: ELECTRICAL INSTALLATION AND PRACTICE

DATE: WEDNESDAY, APRIL 24TH 2024 TIME: 8:00 AM - 10:00 AM

INSTRUCTIONS TO CANDIDATES:

ANSWER QUESTION ONE AND ANY OTHER TWO QUESTIONS.
QUESTION ONE CARRIES 30 MARKS AND ALL OTHERS 20 MARKS EACH.

TIME: *2 Hours*

MMUST observes ZERO tolerance to examination cheating

This Paper Consists of 4 Printed Pages. Please Turn Over.

QUESTION ONE

a) i) Define the following terms as used in electrical installation *(3 Marks)*

i) Equipotential bonding
ii) caravan site
iii) Earthing system

ii) State any three problems encountered when carrying out installation in damp situations. *(3 Marks)*

b) A portable tool on a building site is required to be operated from 240V single phase ac supply point 24m away. The current taken by the tool is 5.3 A, normal ambient temperature of 30^0C applies. The flexible cord is to be a 3 core PVC. Find a suitable size of cable to satisfy the load current and the voltage drop requirement. Take maximum permissible voltage drop of 2.5% of the voltage supply. *(6 Marks)*

c) State any ***three*** IEE regulations governing the use of ceiling roses in electrical installation. *(3 Marks)*

d) Step by step, explain how the continuity test of a completed 4 socket ring power circuit is carried out. State the expected range of resistance values for a healthy circuit. *(4 Marks)*

e) Illustrate how an electrical lighting is achieved for a three-storey building staircase corridor *(4 Marks)*

f) With an aid of a well labelled diagram, explain how improvised current system is used in the protection of electrical installation systems used in corrosive environments *(6 Marks)*

QUESTION TWO

a) Explain the methodology used in the determination of the cable size to be chosen for a particular installation work *(8 Marks)*

b) Discuss any two reasons for the proper choice of cable size is essential in electrical installation *(4 Marks)*

c) Calculate the cable size for the following and state whether it is meeting the voltage drop requirements

- A new load of 8.0 kW;
- Circuit length of 32meters;
- Single core cable thermoplastic 70^0C;
- Ambient temperature of 35^0C;
- In trunking with two other circuits;
- Protective device to be used is device BSEN60898 type B. *(8 Marks)*

QUESTION THREE

a) Distinguish between open and closed alarm circuits. *(4 Marks)*

b) With an aid of a well labelled diagram, explain the operation of a single stroke bell. *(6 Marks)*

c) Explain how insulation resistant test can be carried out on a completed cooker circuit *(7 Marks)*

d) State any three reasons why testing is a necessity in a completed electrical installation. *(3 Marks)*

QUESTION FOUR

a) Define the following terms as used in electrical installation *(4 Marks)*

i) Protective multiple earthing (PME)
ii) Earthing electrode

b) State and explain any ***three*** categories of special installation, giving a reason why they are considered special installation *(6 Marks)*

c) In supervising the installation of a system using PVC cables in steel trunking, what would you consider to be essential to ensure sound construction, long life, and compliance with IEE regulations? *(6 Marks)*

d) Explain any two types of wiring systems used for temporal installation *(4 Marks)*

QUESTION FIVE

a) Distinguish between fused spur and non-fused spur used in power circuit installation. *(3 Marks)*

b) i) Describe "final circuit"

ii) state any two IEE regulations governing final circuits *(4 Marks)*

c) With an aid of a diagram, explain how earthing is achieved using Fault voltage Earth Leakage Circuit Breaker. *(7 Marks)*

d) List any six items which need to checked when carrying out testing and inspection on a finished electrical installation as per the IEE regulations *(6 Marks)*