

**071306T4EEN**

**Electrical Engineering (Power Option) Level 6**

**ENG/OS/PO/CR/01/6**

**Perform Electrical Installation**

**July/August 2023**



**WRITTEN ASSESSMENT**

**TIME: 3 HOURS**

**INSTRUCTIONS TO CANDIDATE:**

*This paper consists of **TWO** sections: **A** and **B**.*

*Answer **ALL** questions in sections **A** and **B** in the answer booklet provided.*

*Marks for each question are indicated in brackets.*

*Do not write on this question paper.*

*Answer the questions in **English**.*

**This paper consists of three (3) printed pages.**

**Candidate should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.**

**SECTION A (40 Marks)**

*Answer **all** questions from this section*

1. Green view electrical company wins a tender to perform electrical wiring in a complete building. Describe **FIVE** factors to consider when choosing a wiring system for this building? (5 Marks)
2. What are the uses of the following basic electrical tools? (4 Marks)
  - i. Stripping knife
  - ii. Steel rule
  - iii. Spirit level
  - iv. Scriber
3. What are the **FOUR** reasons as to why the polarity test is carried out in an electrical installation systems? (4 Marks)
4. An electrician requires different types of electrical accessories while performing domestic installation in a building. Name any **FOUR** electrical accessories required? (2 Marks)
5. What are the basic factors would you take into consideration while designing a lighting scheme for a building? (4 Marks)
6. What are the **THREE** IEE regulations an electrician should consider while making cable joints? (3 Marks)
7. State **THREE** metallic parts which are usually exempted from earthing while carrying out electrical installation. (3 Marks)
8. What are the **TWO** reasons why a neutral conductor is required in the cable supplying a three-phase final sub-circuit that has heating loads that draw different values of current on each of the phases? (2 Marks)
9. Outline any **THREE** equipment at consumer's intake point? (3 Marks)
10. A fluorescent lamp you previously installed does not light at all. What would be the possible causes of this? (3 Marks)
11. State any **THREE** types of cable joints. (3 Marks)
12. Outline **FOUR** main causes of accident in an electrical workshop. (4 Marks)

**SECTION B (60 MARKS)**

*Answer any **three** questions in this section.*

13. (a) With the aid of labelled single line diagram, show typical industrial distribution layout from supply authority mains to consumer loads indicating approximate protective devices. (10 Marks)
- b) A three phase 460V, 100hp, 60Hz, four –pole induction machine delivers rated output power at slip of 0.05. Determine;
- i. Synchronous speed and motor speed (3 Marks)
  - ii. Speed of the rotating air gap field. (2 Marks)
  - iii. Frequency of the rotor circuit. (2 Marks)
  - iv. Slip rpm (3 Marks)
14. (a.) Define a Cable and describe its **THREE** essential parts? (5 Marks)
- b) Describe **FIVE** factors that affect the current rating of a cable? (15 Marks)
15. (a) State **THREE** types of contracts? (3 Marks)
- b) Define a tender and state **THREE** methods of obtaining tenders? (5 Marks)
- c) Describe **SIX** contract documents? (12 Marks)
16. (a) State three conditions which have to be fulfilled before an incoming generator can be switched on to an existing bus-bar and mention one synchronization method. (4 Marks)
- b) With the aid of well labelled wiring diagram, Illustrate ring final circuits. (7Marks)
- c) What is the implication of having earth resistance that exceeds the permissible value? (3 Marks)
- d) You have been awarded a contract to design a single phase transformer equipment with specifications for normal operations. Determine a minimum circuit breaker trip rating and interrupting capacity for a 10 KVA single phase transformer with 4% impedance, to be operated from a 415 volt 50 Hz source. (6 Marks)

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