



FIJI NATIONAL UNIVERSITY

COLLEGE OF ENGINEERING, SCIENCE & TECHNOLOGY (CEST)

SCHOOL OF ELECTRICAL & ELECTRONICS ENGINEERING

PROGRAMME: CERTIFICATE III IN ELECTRICAL ENGINEERING-STAGE 3

UNIT CODE: EEC334

UNIT TITLE: REGULATION AND STANDARDS

FINAL EXAMINATION – QUARTER 3, 2019

ROOM: AS PER TIMETABLE

TIME: 2 HOURS 10 MINUTES

INSTRUCTIONS TO STUDENTS

1. You are allowed **10 minutes** extra **reading time** during which you are **NOT** to write.
2. Begin each **SECTION** on a fresh page and use both sides of the sheet.
3. Write your candidate number at the top of each attached sheet.
4. Insert all written foolscaps, graph paper, drawing paper, etc. in their correct sequence and secure with a string.
5. For all sheets of paper on which rough/draft work has been done, cross it through and **ATTACH** these to your answer scripts.
6. Write clearly the number(s) of the question(s) attempted on the top of each sheet.
7. Show all working where necessary.
8. **AS/NZS 3000:2007 Wiring Rule Books** will be provided.
9. **ALWAYS CHECK YOUR WORK BEFORE YOU LEAVE THE EXAM ROOM.**
10. **ANSWER ALL QUESTIONS.**

SECTION A**(20 MARKS)****Answer ALL questions in this section**

1. What are the things as an electrician would you consider when carrying out Risk Assessment in an installation? (2.5 Marks)
2. Name **four** recommended personal protective equipment (PPE) and name the body part it protects. (3 Marks)
3. State **four** precautions to be taken when erecting ladders. (2 Marks)
4. What are the **two** main risk associated with poor electrical installations and faulty electrical appliances? (1 Mark)
5. Name three types of ladders. (3 Marks)
6. Explain the difference between 'Lockout' and 'Tagout'? (4.5 Marks)
7. Name (4) four method of determining maximum demand. (4 Marks)

SECTION B**(30 MARKS)**

1. Determine the maximum demand for a single-phase 230 V installation that comprises:
 - 19 lighting points
 - 2 single and 2 double 10A socket-outlets
 - 3 x 15 A plug socket-outlets
 - 10 kW range
 - 3500W storage water heater(15 Marks)
2. A single phase subcircuit is limited to a voltage drop of 6V. The circuit is wired with a V75 TPS copper cable to supply a current of 30A, 230V to factory load at a distance of 8m. What would be the size of the cable? (5 Marks)
3. Determine the pole/post length to carry a three phase aerial line using a three core, 10mm² hard-drawn insulated copper cable for a distance of 23m over an area used by vehicles. The soil is of poor quality where pole is to be erected. (5 Marks)
4. Calculate the maximum length of a circuit which has the following specification:
 - Nominal phase voltage of 230V
 - Fault current of 230A
 - 4mm² active conductor and 2.5mm² earthing conductor (both are copper cable)
 - Resistivity of copper is $22.5 \times 10^{-3} \Omega \cdot \text{mm}^2/\text{m}$(5 Marks)

Answer the following questions using AS/NZS 3000:2007 Wiring Rules provided.

1. Define the following electrical terms:
 - (a) Active conductor
 - (b) Barrier
 - (c) Circuit- breaker
 - (d) Damp situation
 - (e) MEN

(10 Marks)
2. State the Scope of the AS/NZS 3000:2007 Wiring Rules.

(2 Marks)
3. Name three (3) places where switchboards shall be located.

(3 Marks)
4. List the factors to be considered in designing in electrical installation.

(3 Marks)
5. State two (2) reasons of dividing electrical installations into various circuits.

(2 Marks)
6. Name four (4) types of RCD's recommended to be used in electrical installations.

(4 Marks)
7. What are the recommended operating temperatures of the following types of cables for normal use?
 - (a) Thermoplastic TPE-75
 - (b) Elastomeric R-S-150
 - (c) MIMS cable

(6 Marks)
8. State the recommended nominal minimum cross sectional area of the following conductors:
 - (a) Insulated conductors used as Signal and relay control circuits
 - (b) Copper bare conductors.
 - (c) Aluminum Aerial conductors

(6 Marks)
9. What are the recommended conductor colors for the following?
 - (a) Protective Earth
 - (b) Neutral
 - (c) Active

(6 Marks)
10. List (4) four types of wiring enclosures recommended to be used.

(4 Marks)
12. Name (4) four types of conductors recommended to be used as aerial wiring.

(4 Marks)

END OF QUESTION PAPER