FIJI NATIONAL UNIVERSITY

COLLEGE OF ENGINEERING, SCIENCE & TECHNOLOGY (CEST)

SCHOOL OF ELECTRICAL & ELECTRONICS ENGINEERING

CERTIFICATE IV IN ELECTRICAL ENGINEERING STAGE 2

EEE395- ELECTRICAL INSTALLATION TECHNOLOGY 1

FINAL EXAMINATION – TRIMESTER 3, 2015

DATE/DAY: **TIME:** **ROOM:**

INSTRUCTIONS TO STUDENTS

1. You are allowed **10 minutes** extra **reading time** during which you are **NOT** to write.
2. Begin each answer 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. Use of programmable calculator(s) is prohibited.
8. Attempt **ALL** questions in all Sections
9. SAA Rule Book is allowed.

SECTION A **SHORT ANSWERS** **(20 MARKS)**

Answer the following questions by quoting the rule number and relevant content from the SAA wiring rule book.

1. Outline the precautions to be taken to protect aluminum cables from corrosion. (3 marks)

2. Should semi-enclosed rewireable fuses be installed in new installations? (3 marks)

3. List three methods of installing category A underground wiring system. (4 marks)

4. How should socket outlets be installed? (2 marks)

5. Name three methods of installation not permitted for Mineral insulated metal sheathed cable. (4 marks)

6. What are the three things any wiring system should avoid if it is to be used in a hazardous area? (4 marks)

7. What type of cables should be used as supports of a caternary if it is installed out-of-doors? (2 marks)

SECTION B **LONG ANSWERS** **(15 marks)**

1. Briefly explain on what is renewable energy. (3 marks)

2. Why don't we use renewable energy all the time? (3 marks)

3. How do solar panel works. (2 marks)

4. State the principle of operation of the Hydro-Electric Plant. (3 marks)

5. Briefly explain on what is the Grid System and state and explain what type of distribution system is used in Fiji. (4 marks)

SECTION C MULTIPLE CHOICE (15 MARKS)

In each of the following statements, one of the suggested answers is the best one. Write the identifying letter of the answer beside the question number on your answer sheet.

1. The major part of the electricity supply and distribution system is by:

a. Bare aerial conductors.
b. Insulated conductors.
c. Underground cables.
d. Enclosed aerial conductors.

2. An enclosure for housing and protecting electrical cables and conductors is known as:

a. Busway system
b. Caternary support
c. Enclosed cable
d. Cable trunking.

3. A closed passage formed underground or in a structure into which cables are drawn is known as:

a. catenary
b. cable trunking
c. bushway
d. cable duct

4. The most common type of fitting designed by the manufacturers to be used in the installation of MIMS cables is the:

a. insulating tape
b. multimetre
c. screwdriver
d. cable gland

5. The wiring system confined to low and extra low voltage lighting application is:

a. Open wiring
b. Track systems
c. Undercarpet wiring
d. Trunking

6. The value of the neutral current in any three phase wiring system is:

a. phaser sum of the line current
b. sum of the phase currents
c. minus the phaser sum of the line currents
d. all of the above

7. Apart from being double insulated the cable used for catenary support system should be:

a. copper
b. solid
c. stranded
d. aluminium

8. One of the places where under-floor trunking system is best supplied is the:

a. under-carpet
b. underground
c. under supermarket counter
d. under workshop machines

9. The best type of cable to be used in boiler or engine rooms is:

a. TPS cable
b. PVC cable
c. Steel cable
d. MIMS cable

10. The most preferred wiring system in densely populated areas for distribution would be:

a. opening wiring
b. trunking
c. underground
d. cable ducts

11. One of the safety precautions to be observed before commencing work and after isolating a circuit in a domestic installation is to:

a. inform others
b. repair quickly
c. as certain reason
d. test and confirm

12. The characteristic of 3 phase system is:

a. two voltages locked at 120 E apart
b. three voltages locked at 90 E apart
c. three voltages locked at 120 E apart
d. two voltages locked at 90 E apart

13. A three phase 4 wire supply provides connection to:

a. three phase balance load
b. three phase unbalanced load
c. three phase and single phase load
d. all of the above

14. True power is measured in:

a. KVAR
b. Kg
c. KW
d. KVA

15. Most electrical accidents occur in domestic installation due to faulty:

a. equipment
b. accessories
c. parts
d. extension leads

SECTION D (50 MARKS)

1. Determine the maximum Demand current for a single phase 240v domestic supply connected with the following loads:

   - 23 lighting point
   - 4 x single 10A GPO's
   - 4 x double 10A GPO's
   - 2 X 15A socket outlet
   - 1 x 1KW range
   - 1 x 1 KW Air Conditioner

   (12 marks)

2. List down five advantages of alternating current (A.C) over direct current (D.C). (5 Marks)

3. What are the three major reasons of earthing? (3 Marks)

4. Describe the following electrical systems and also indicate the voltage values for each system
   a) Generation
   b) Transmission
   c) Distribution (7 marks)

5. List the procedure to follow in order to isolate the power supply to an installation or circuit for maintenance work is the installation consists of computers and other important office equipment. (6 marks)

6. Refer to various tables in the SAA rule book for the following:

   (i) One method of installation permitted for insulated cables (without sheath).
   (ii) Maximum limiting temperature of MIMS cables
   (iii) Minimum size of copper insulated flexible conductor.
   (iv) Minimum height above ground for bare live conductors over areas used by vehicles.
   (v) Maximum span allowable for insulated annealed copper used as aerial conductor. (8marks)

7. A 3-phase, star-connected alternator delivers a line current of 65 A to a balanced delta-connected load at a line voltage of 380 V. Calculate

(a) the phase voltage of the alternator,

(b) the alternator phase current and

(c) the load phase current. (6 marks)

################ ***THE END*** ################