



COLLEGE OF ENGINEERING, SCIENCE & TECHNOLOGY
SCHOOL OF ELECTRICAL ENGINEERING & ELECTRONICS ENGINEERING
CERTIFICATE 4 IN ELECTRICAL ENGINEERING – STAGE 4
EEE 445 ELECTRICAL INSTALLATION TECHNOLOGY 2
FINAL EXAMINATION – PENSTER 3, 2014

INSTRUCTIONS TO STUDENTS

1. *You are allowed 10 minutes Extra reading time during which you are NOT to write*
2. *Two hours only is the time allocated for candidates to do this examination paper*
3. *Begin each answer on a fresh page and use both sides of the sheet.*
4. *Write your candidate-number at the top of each attached sheet.*
5. *Insert all written foolscaps, graph paper, drawing, etc. in their correct sequence and secure with string.*
6. *For all sheets of paper on which rough/draft work has been done, cross it through and you MUST ATTACH to your answer scripts.*
7. *Write clearly the number(s) of the question(s) attempted on top of each sheet.*
8. **ANSWER ALL QUESTIONS.**
9. *Show all workings where necessary.*
10. *Do not use programmable calculators, especially the ones that do the conversion of number systems.*
11. **AS/NZ STANDARD WIRING RULE BOOK IS ALLOWED**
12. **ALWAYS CHECK YOUR WORK BEFORE YOU LEAVE THE ROOM.**

C4EL 4, EEE 445 – ELECTRICAL INSTALLATION TECHNOLOGY 2 – PENSTER 2 [2014]**SECTION A (40 MARKS) BRIEF ANSWERS.**

ATTEMPT ALL QUESTIONS, WRITE DOWN APPROPRIATE RULE NUMBERS.

QUESTIONS:

1. List three ways of protecting wiring systems located above ceilings. (4 marks)

2. List three ways of protecting plugs and socket – outlets for SELV and PELV from short-circuits (4 marks)

3. Solar renewable energy with inverter/charger :
 - a. explain the concept of how it works and
 - b. advantages & disadvantages(8 marks)

4. Briefly explain two important tests requirements of the AS/NZ standard that should be met in regard to all electrical installations, any alterations, additions and repairs. (6 marks)

5. List and explain five testing methods for any electrical installation to determine that there is a fault or not in the installation. (10 marks)

6. A building has sub-mains and final sub-circuits greater than 100 Amperes per phase with no current limiters and it also has a standby generator as an alternative supply. How can you control the two input powers and show methods of identification for isolation devices . (8 marks)

[C4EL 4, EEE445-ELECTRICAL INSTALLATION TECHNOLOGY 2 – PENSTER 2 [2014]**SECTION B (40 MARKS) PROBLEM QUESTIONS.**

ATTEMPT ALL QUESTIONS, WRITE DOWN APPROPRIATE RULE NUMBERS.

QUESTIONS:

1. Determine the maximum demand of a single phase in a domestic Electrical Installation comprising of the following loads: (15 marks)

30	lighting points
15 m	lighting track
8	10 A single socket-outlets
6	10 A double socket-outlets
2	40 W exhaust fans
2	15 A socket-outlets
1	7 kW range
1	5.2 kW water heater
1	4 kW tennis court lighting

2. A water pump specification: (Total: 25 marks)

a.	B. h. p.	10
b.	Voltage	415 V
c.	Phase	3 \emptyset , 4 wire system
d.	Freq.	50 Hertz
e.	P. f.	0.85
f.	Location	20 m from the sub-board
g.	Supply cable	PVC/PVC

Find:

- a. Power input to the motor (3 marks)
- b. Full load current consumed by the motor (3 marks)

Cont...

- c. Supply cable size, to motor (3 marks)
- d. Cable protection (under-ground main to motor) (3 marks)
- e. Motor protection from over load & short circuit (3 marks)
- f. Depth of cable underground (3 marks)
- g. Show motor isolation methods (3 marks)
- h. Recommended capacity of protective device (show calculation) (4 marks)

C4EL 4, EEE 445 – ELECTRICAL INSTALLATION TECHNOLOGY 2 – PENSTER 2 [2014]

SECTION C (20 MARKS) BRIEF ANSWERS [WRITE DOWN WIRING RULES WHERE APPRPPRIATE].

QUESTIONS:

1. List two device for protection agaist both over load and short-circuit currents. (3 marks)
2. What the two general hazardous areas? (3 marks)
3. Name two common cable wiring enclosures used in Fiji? (3 marks)
4. State three requirements when designing an electrical installation? (4 marks)
5. For a domestic wiring system, state two mediums used to connect to the general mass of earth? (3 marks)
6. By using a megger tester to test the insulation resistance of an Installation, what are the required values of resistance in mega-ohms for a 1000 V and 500 V range. (4 marks)

END

