



FIJI NATIONAL UNIVERSITY

**COLLEGE OF ENGINEERING, SCIENCE AND
TECHNOLOGY**

**SCHOOL OF ELECTRICAL AND ELECTRONIC
ENGINEERING**

CERTIFICATE IN ELECTRICAL SERVICEMAN'S COURSE – STAGE 2

EEE211 APPLIED ELECTRICITY- 1
FINAL EXAMINATION PAPER –PENSTER 4- 2012

DAY/DATE: - / - TIME: -

ROOM: As per time table

INSTRUCTIONS TO STUDENTS:

1. You are allowed 10 minutes extra reading time during which you are not allowed 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 answer sheet.

4. Insert all foolscaps, graph paper, drawing paper etc in their correct sequence and secure with string.
5. For all sheets of paper on which rough / draft work has been done, cross it through and you must attach to the answer booklet.
6. Write clearly the number(s) of the question(s) attempted on top of each sheet.
7. **ATTEMPT ALL QUESTIONS**
8. Show all workings where necessary.
9. Programmable calculators are not allowed.

Section A **MULTIPLE CHOICE**

(20 marks)

Instructions:

Choose the best answer by circling the corresponding alphabet on the attached answer sheet.

1. Choose best instrument that is best used to measure the operating voltage of a general power outlet.
a) Voltmeter.
b) Ohmmeter.
c) Ammeter.
d) Both a) and c).

(1 mark)
2. Which component stores electric charge?
a) Resistor.
b) Capacitor.
c) Transformer.
d) Inductor.

(1 mark)
3. Electrons have:
a) no charge.
b) Positive charge.
c) One Charge.
d) negative charge.

(1 mark)
4. Choose the cell that can be recharged:
a) Carbon – Zinc Cell.
b) Nickel Cadmium Cell.
c) Lead Acid Cell.
d) Both b) and c).

(1 mark)

5. The outcomes of the magnetic field lines pattern for a straight conductor:
a) North to south of the conductor.
b) Into the page.
c) Concentric circles.
d) Out of page.

(1 mark)
6. Which test instrument is used to measure the quantity associated with resistors?
a) Ohmmeter.
b) Ammeter.
c) Voltmeter.
d) Current meter.

(1 mark)
7. What is the direction of the conventional current flow?
a) From negative to positive of the energy source.
b) From positive to negative back to positive of the energy source..
c) From positive to negative of the energy source.
d) None of the above.

(1 mark)

8. What is the SI unit for capacitance?

- a) Ohms.
- b) Farads.
- c) Capacitance.
- d) Both b) and c).

(1 mark)

9. Which of the following terms is associated with the flow of electrons?

- a) Resistance.
- b) Voltage.
- c) Inductance.
- d) Current.

(1 mark)

10. In any series circuit:

- a) Voltage is same.
- b) Current is same.
- c) Resistance is same.
- d) None of the above.

(1 mark)

11. Voltmeters are always connected in:

- a) Series
- b) Parallel
- c) Direct
- d) Series/Parallel

(1 mark)

12. What equipment is used for testing the density of the electrolyte in a cell.

- a) Voltmeter.
- b) Hydrometer.
- c) Ammeter.
- d) CRO.

(1 mark)

13. In a closed circuit there is:

- a) Current flow.
- b) No current flow.
- c) Leakage current
- d) Filter current

(1 mark)

14. Materials that oppose the flow of electrons are known as;

- a) Insulators.
- b) Conductors.
- c) Semi-conductors
- d) Super conductors

(1 mark)

15. Which test instrument is used to measure the precise resistance of a resistor?

- a) CRO.
- b) Voltmeter.
- c) Ohmmeter.
- d) Ammeter.

(1 mark)

16. What would the value of resistance be if two 5 ohms resistors were connected in parallel?

- a) 6 ohms.
- b) 3 ohms.
- c) 2.5 ohms.
- d) 1.5 ohms.

(1 mark)

17. One of the characteristic of magnetic lines of force:

- a) Cross each other
- b) Line each other
- c) Never cross each other
- d) Crisscross

(1 mark)

18. The unit of inductance is:

- a) Volts.
- b) Hertz.
- c) Hendry.
- d) Lux.

(1 mark)

19. What type of cells can be recharged?

- a) Primary cells
- b) Resistance cells
- c) Carbon-zinc
- d) Secondary cells

(1 mark)

20. One kilo-watt-hour is equal to:

- a) 3.6 MJ
- b) 1000 Watts
- c) 1 Watt
- d) 1 MJ

(1 mark)

Section B

(20 marks)

PART A-MATCHING

- | | |
|--------------------------------|---|
| 1. Series/ parallel connection | A. Conductor |
| 2. Protons | B. Have plenty free electrons |
| 3. Power | C. A component that opposes current flow. |
| 4. Voltage | D. Methods of component connection. |
| 5. Conductors | E. Electrical pressure |
| 6. Electrons | F. Positively charged particles |
| 7. Energy | G. Watts |
| 8. Copper | H. Negatively charged particles |
| 9. Insulator | I. Product of power and time |
| 10. Resistor. | J. Does not conduct electricity |

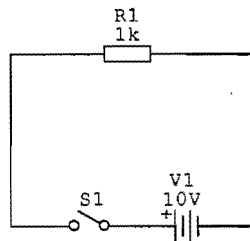
(10 marks)

PART B – TRUE/ FALSE

Write true for the correct answer and false for the incorrect answer. One mark for each correct answer

1. In the Right-hand-rule regarding a straight conductor the thumb indicates the direction of current flow.
2. Capacitors in parallel do not have the same voltage across each one.
3. Black is denoted as number 1 for either the four or five band resistor

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4. The Circuit shown below is that of a closed loop circuit:



5. The SI unit of voltage is amperes.
6. The resistance of a resistor is measured with an ohmmeter.
7. A secondary cell is chargeable.
8. Capacitors in parallel is added together to give the total capacitances.

9. In the right hand thumb rule, the thumb represents the flow of current.
10. In Kirchoff's current law, the total currents entering a node are not equal to the currents leaving that node

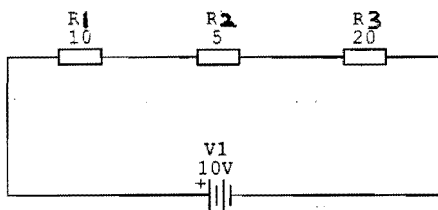
(10 marks)

Section C

(30 marks)

1. For the given circuit diagrams and determine:

- a) Total resistance, R_T in Ω . (2 marks)
- b) Total Current, I_T in A. (2 marks)
- c) Voltage across R_1 (2 marks)

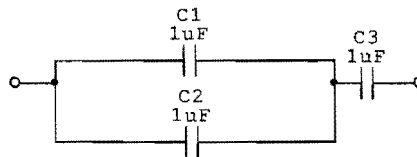


2. When the maximum value of an alternating current is 10A, determine:

- a) Average value? (2 marks)
- b) R.M.S. value? (2 marks)
- c) Peak value? (2 marks)
- d) Peak + to - peak value? (2 marks)

3. From the given circuit, determine:

- a) total capacitance, C_T (3 marks)



- b) Outline one characteristic for each of the following (3 marks)

- 1) Conductors.
- 11) Insulators.
- 111) Permanent Magnet.

4. Determine the value of the resistor 4-band color codes:

- a) Brown, black, red, gold. (2 marks)
- b) Violet, green, black (2 marks)
- c) Red, violet, orange, silver. (2 marks)
- d) Yellow, black, yellow, gold. (2 marks)

5. Find the total voltage if two batteries are connected in series. One battery has 14V whilst the other has 8.1V.

(2 marks)

Section D

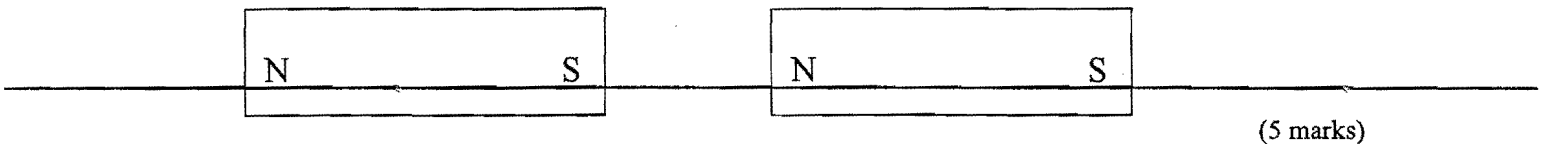
(30 marks)

1. What is Ohm's Law? (3 marks)

2. List four factors that affect the resistance of any conductor and explain the relationship the relationship of each with respect to resistance. (8 marks)

3. Draw an a.c waveform and show the following values: (8 marks)
 - a) Peak value.
 - b) RMS value.
 - c) Average values

4. Draw the magnetic field lines and show the direction with the indication of an arrow head of two bar magnets.



5. Draw a circuit diagram and connect the appropriate meters to measure the following quantities: (6 marks)
 - a) Voltage.
 - b) Current.
 - c) Resistance.

THE END