



FIJI NATIONAL UNIVERSITY

College of Engineering, Science & Technology

SCHOOL OF ELECTRICAL AND ELECTRONIC ENGINEERING
TRADE DIPLOMA IN BUILDING & CIVIL ENGINEERING

EEE460 – INTRODUCTION TO ELECTRICAL AND ELECTRONIC ENGINEERING

FINAL EXAMINATION – TRIMESTER 3 – 2017 **NO. OF PAGES = 7**

TIME: TBA

DURATION: 3 HOURS

Date: TBA

INSTRUCTIONS TO STUDENTS:

1. You are allowed 10 minutes **EXTRA** as 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 foolscap, graph paper, drawing paper, etc. in their correct sequence and secure well.
 5. For all sheets of paper on which rough/draft work has been done, cross it through and attach to your answer scripts.
 6. Show all workings where necessary
 7. Diagrams and graphs can be drawn in pencil.
 8. Non- programmable calculators are allowed.
 9. **ATTEMPT ALL QUESTIONS**
 10. **Check your work before you leave the room!!**
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Section A

Electronic Components

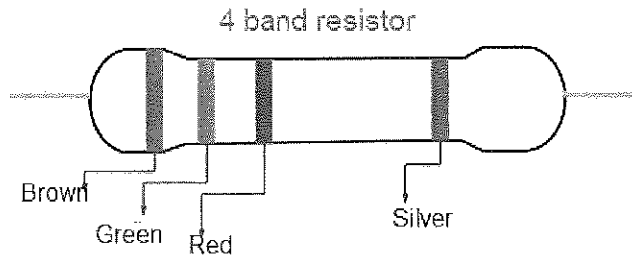
(20 marks)

Question 1

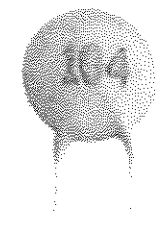
- a) What is the function of a resistor in an electronic circuit **(2 mark)**
- b) What is the function of a capacitor in an electronic circuit? **(2 marks)**
- c) What is the function of a diode in an electronic circuit? **(2 marks)**
- d) What is the function of an inductor in an electronic circuit? **(2 marks)**
- e) What is the function of a BJT transistor in an electronic circuit? **(2 marks)**

Question 2

- a) For the 4-band resistor given below;



- (i) Calculate its value? **(2 marks)**
 - (ii) Calculate the upper and lower limits? **(2 marks)**
 - (iii) Calculate the tolerance range? **(2 marks)**
- b) What are the values of the capacitors given below? **(4 marks)**
- (i)
 - (ii)



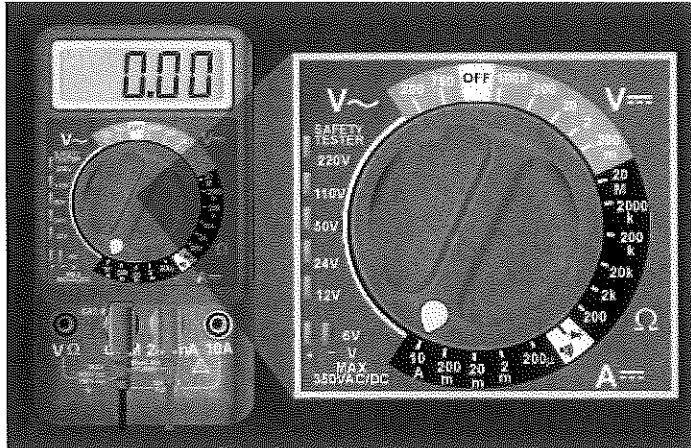
Section B

Meter Measurement & Calculation

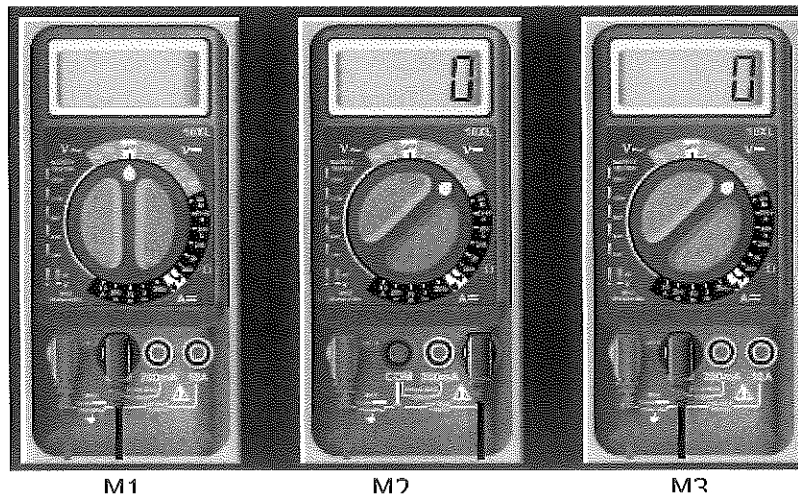
(20 Marks)

Question 1

- a) When using the setup below to measure current no results were obtained? Explain why? (2 marks)



- b) Which multimeter is setup to measure DC voltage? Explain your answer? (2 marks)

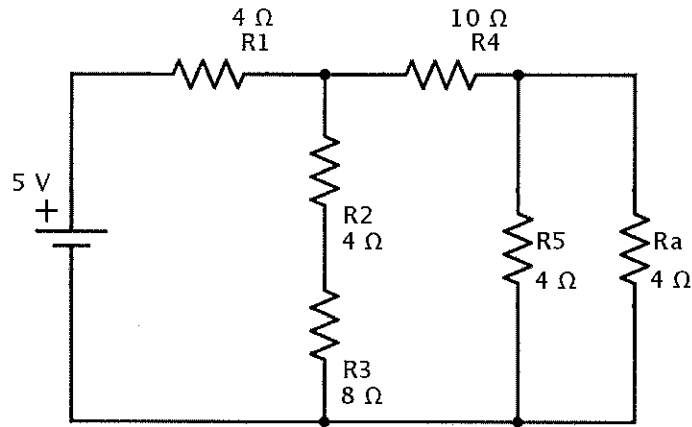


- c) Explain how to measure a germanium diode using;
(i) Digital Multimeter (DMM) (3 marks)
(ii) Analog Multimeter (AMM) (3 marks)

Question 2

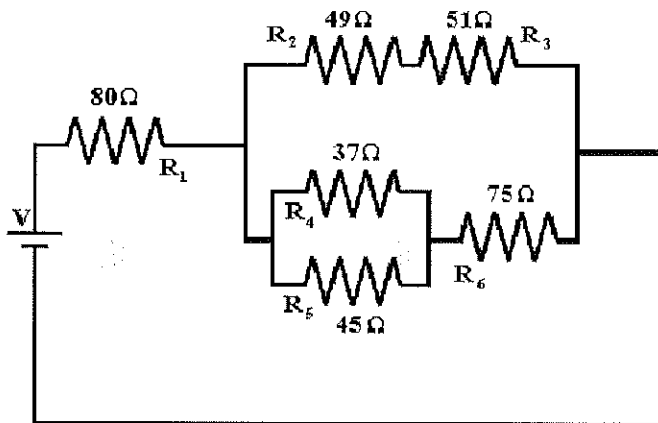
a) Calculate the total resistance of the given circuit below?

(3 marks)



b) Calculate the total resistance of the given circuit below?

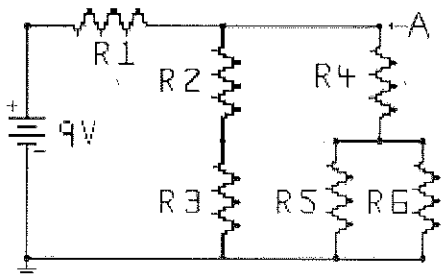
(5 marks)



c) Calculate the total resistance of the given circuit below?

(2 marks)

$R_1 = 220\Omega, R_2 = 110\Omega, R_3 = 130\Omega, R_4 = 430\Omega, R_5 = 110\Omega, R_6 = 110\Omega$



Section C

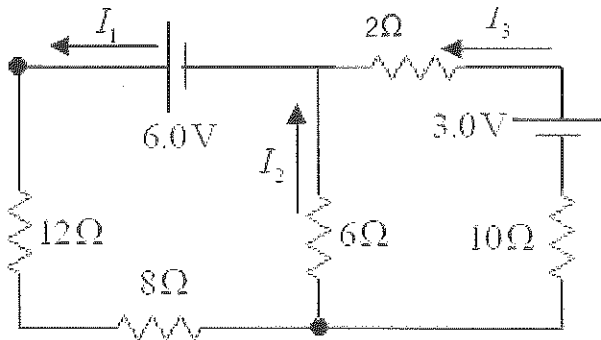
Kirchhoff's Law

(20 marks)

Question 1

Calculate current I_1 , I_2 and I_3 using Kirchhoff's Law.

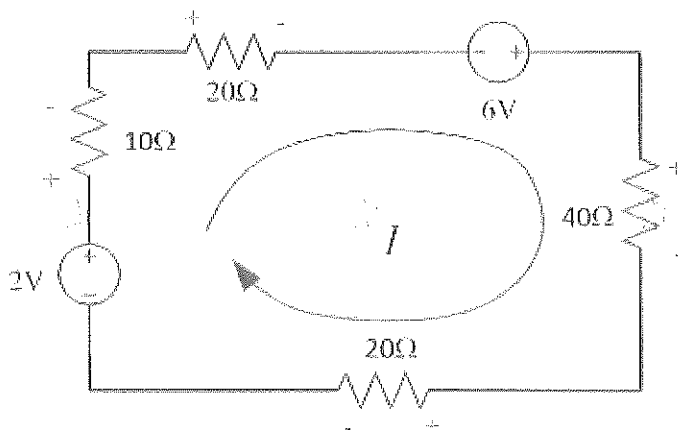
(10 marks)



Question 2

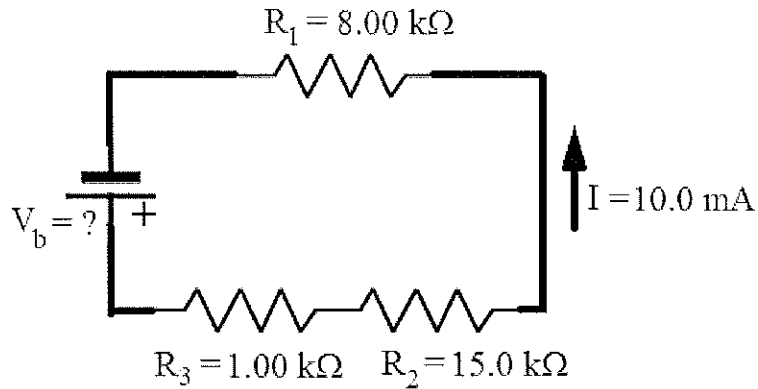
a) Calculate current I for the circuit below using Kirchhoff's Law?

(5 marks)



b) Calculate voltage V_b for the circuit below using Kirchhoff's Law?

(5 marks)



Section D Electrical Motor, Transformer and Power Supply (20 marks)

Question 1

- a) What is the function of the electric motor? **(1 marks)**
- b) A four pole three-phase inductor which has a full load rated speed of 1750RPM is operating at 60Hz.
 - (i) Calculate the Synchronous Speed (RPM)? **(2 marks)**
 - (ii) Calculate the Slip Rate? **(2 marks)**
- c) What are transformers? **(2 marks)**
- d) Name the three basic components of a transformer? **(3 marks)**

Question 2

With aid of a diagram explain the operation of a AC-DC full-wave rectifier circuit? **(10 marks)**

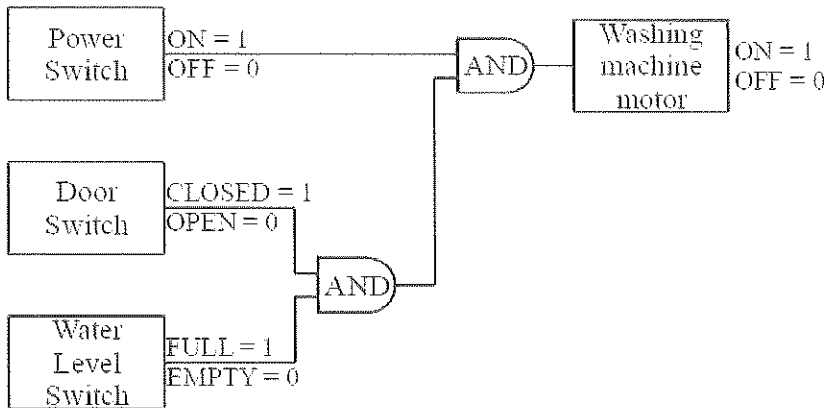
Section E

Digital Circuits

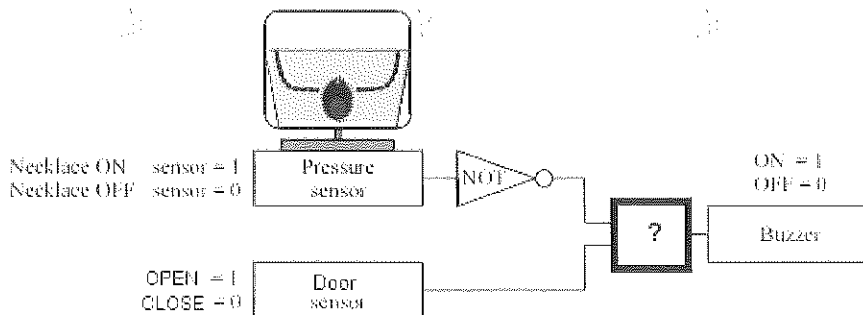
(20 marks)

Question 1

- a) The diagram below shows a *control system* which may be fitted in an automatic washing machine. What conditions will stop the washing machine working? Use a truth table to depict this? **(5 marks)**



- b) An alarm system is setup to protect a valuable diamond necklace. With your knowledge about logic gates attempt the questions below;



- (i) What logic gate/gates should fit into the box in the diagram? **(2 marks)**
 (ii) Draw the truth table for the alarm system? **(3 marks)**

Question 2

- a) Draw the truth table for the S-R flip flop using NOR gates? **(5 marks)**
- b) Draw the truth table for the S-R flip flop using NAND gates? **(5 marks)**

=====THE END=====