FIJI NATIONAL UNIVERSITY

SCHOOL OF ELECTRICAL & ELECTRONIC ENGINEERING

RADIO ELECTRONICS SERVICEMEN'S COURSE STAGE 1

UNIT: EEE201 BASIC ELECTRONICS

FINAL EXAMINATION **PENSTER 1, 2014**

PART A: MULTIPLE CHOICE QUESTIONS (20 MARKS)

(2 marks each)

The Answer sheet to this section is attached at the back of this examination paper. Circle the correct answers of your choice in the answer sheet. When you have finished, remove the answer sheet, insert it in your Answer Booklet and secure with a string.

1. Three states in which matter exists are:

   A. Solid, air and rubber.
   B. Solid, liquid and rubber.
   C. Solid, air and gas.
   D. Solid, liquid and gas.

2. For an atom to be electrically neutral:

   A. The negative charge (-) of each electron is less in magnitude to the positive charge (+) of each proton.
   B. The negative charge (-) of each electron is equal in magnitude to the positive charge (+) of each proton.
   C. The negative charge (-) of each electron is greater in magnitude to the positive charge (+) of each proton.
   D. None of the above.

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3. The practical unit adopted for measuring current is the:

   A. Volt.
   B. Ampere.
   C. E.M.F.
   D. Coulomb.

4. 10 000 volt when converted is equal to:

   A. 1 mV
   B. 10 KV
   C. 100 nV
   D. 10 mV

5. In colour coded resistors, a gold 4th band indicates:

   A. 5 % Tolerance
   B. 10% Tolerance
   C. 20% Tolerance
   D. 25% Tolerance

6. Diodes are classified as:

   A. Conductors
   B. Non-conductors
   C. Semi-conductors
   D. Both conductors and Non-conductors

7. Which of the following is **NOT** true regarding UJT Transistors:

   A. Is a solid-state device.
   B. It is very stable over a wide range of temperatures.
   C. Is a single-based diode and has two terminals.
   D. It allows a reduction of components when used in place of a conventional transistors.

8. How many input combinations exist for a four-input AND gate?

   A. 4
   B. 8
   C. 12
   D. 16

9. Rectification is the changing of:

   A. An ac voltage to a pulsating dc voltage.
   B. A dc voltage to a pulsating ac voltage.
   C. A direct dc voltage to a pulsating dc voltage.
   D. None of the above.

10. Current is the:

   A. Potential energy in moving a charge of 1 Coulomb.
   B. Difference in potential between two points.
   C. Tendency of a conductor to obstruct the Voltage.
   D. Rate of flow of charge along a conductor.

SECTION B: SHORT ANSWER QUESTIONS: **(30 MARKS)**

(2 marks each)

Q.1 Draw the symbols of a:

i. Resistor
ii. Diode

Q.2 Name at least **TWO** of the three factors that affect capacitance?

Q.3 What is the basic unit of inductance?

Q.4 In a properly functioning circuit, can both the input and output of an inverter be HIGH at the same time?

Q.5 Draw the symbol of a NOR gate.

Q.6 What term is used to describe the period when the diode is not conducting?

Q.7 Current that flows in pulses in the same direction is called _____.

Q.8 For a diode to act as a rectifier, should it be connected in series or parallel with the load?

Q.9 What is the purpose of a filter in a dc power supply?

Q.10 What components are used as filters in a dc power supply?

Q.11 What is a solid state device?

Q.12 A fundamental law of electricity is that the ELECTRON FLOW IS _____ PROPORTIONAL TO THE APPLIED VOLTAGE.

Q.13 When the third band is Black (in resistor color coding), the resistor's value is_____.

Q.14 Draw the symbols of the PNP and NPN Transistors.

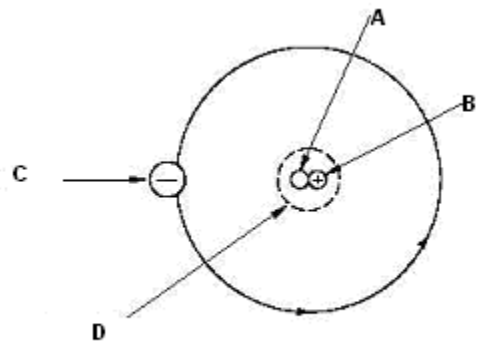
Q.15 Draw the symbol of an AND gate.

SECTION C: PRACTICAL/THEORY AND CALCULATION QUESTIONS:

(50 MARKS)

Question 1:

a. Label the parts of the atom shown in Figure 1 below:



(4 marks)

b. With the aid of the diagram in Figure 2 below, explain the operation of the diode when it is in:

a. Forward Bias.
b. Reverse Bias.

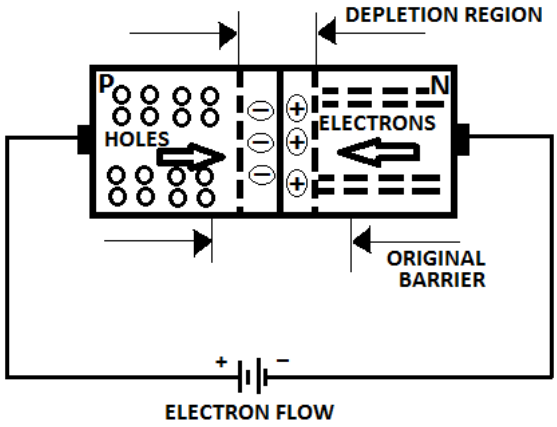


Figure 2

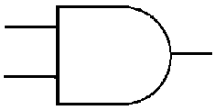
(5 marks)

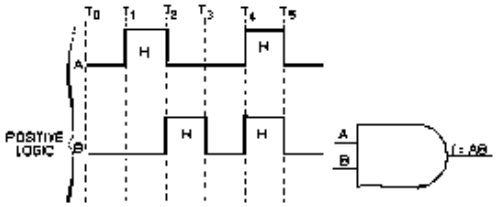
Question 2:

2a. Draw the block diagram of a linear D.C. power supply.

(10 marks)

b. Shown below is the symbol of a AND gate. Draw the Truth Table and output clock pulses based on the inputs given.





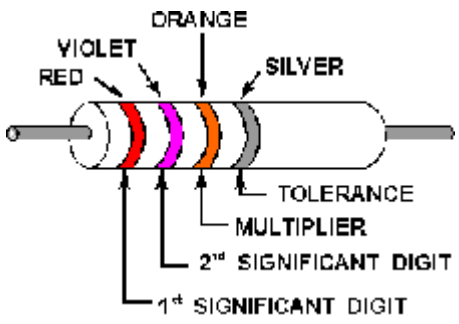
(6 marks)

Question 3:

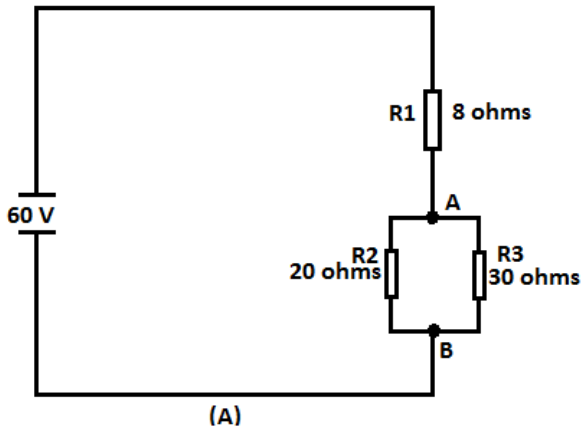
a) Draw and explain how the Half-Wave rectifier operates and draw the output waveform.

(5 marks)

b) Calculate the value of the resistor given in figure 2 below. (Also give the operation range given the tolerance.) **(4 marks)**



c. Given the circuit below, calculate: **(16 marks)**



I. The equivalent resistance of R2 and R3.
II. The equivalent resistance in ohms of the whole circuit.
III. Redraw the original circuit representing the equivalent resistance of the entire circuit.
IV. Calculate the total current I_T in the circuit.
V. Find the total power in the circuit?
VI. Find the voltage drop across R1, R2 and R3?
VII. Find the power used by R1?
VIII. Find the current through R2 and R3? *(2 marks each)*

END OF EXAM PAPER

This answer sheet is to be used for section A as instructed.

ID NUMBER: _____

SECTION A **MUTIPLE CHOICE** **20 MARKS]**

Circle the letter of your **best** choice

1	**A**	**B**	**C**	**D**
2	**A**	**B**	**C**	**D**
3	**A**	**B**	**C**	**D**
4	**A**	**B**	**C**	**D**
5	**A**	**B**	**C**	**D**
6	**A**	**B**	**C**	**D**
7	**A**	**B**	**C**	**D**
8	**A**	**B**	**C**	**D**
9	**A**	**B**	**C**	**D**
10	**A**	**B**	**C**	**D**