



PAN AFRICA CHRISTIAN UNIVERSITY

SCHOOL OF LEADERSHIP, BUSINESS AND TECHNOLOGY

**END OF SEMESTER EXAMINATION FOR DIPLOMA IN
INFORMATION COMMUNICATION TECHNOLOGY**

MAY – AUGUST 2018

CAMPUS: ROYSAMBU

DEPARTMENT: COMPUTING & INFORMATION TECHNOLOGY

COURSE CODE: DICT0122

COURSE TITLE: COMPUTER ELECTRONICS

EXAM DATE: FRIDAY 10TH AUGUST 2018

TIME: 5:30PM-8:30PM

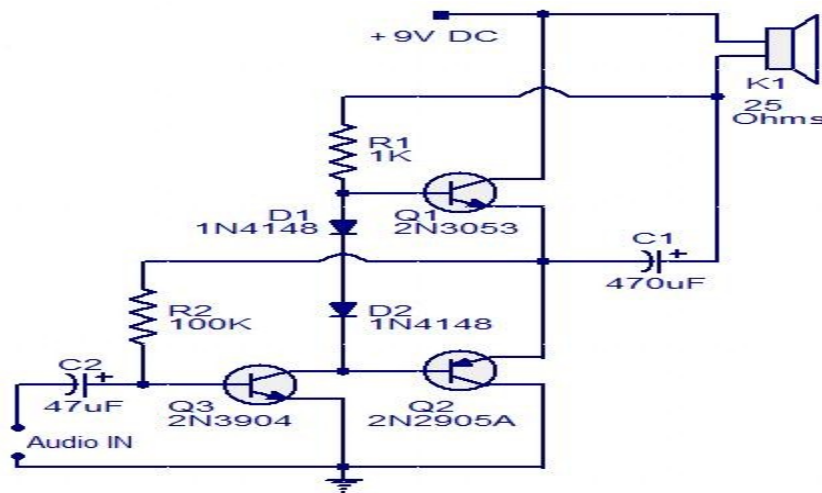
INSTRUCTIONS

- Read all questions carefully before attempting.
- Write your **student number** on the answer booklet provided.
- This exam script has **TWO (2)** sections.
- Read all questions carefully before attempting.
- Answer All questions in Section **A** and any other **Four** questions in Section **B**.
- Write only your **student number** on the answer booklet provided.
- None programmable calculator permitted
- Calculators on phones, tablets and computers are NOT permitted in Theory Papers.
- *ALL PAC University's examination rules and regulations apply*

Section One (I) 20 Marks.

Question One - Compulsory:

- Briefly describe with help of circuit diagrams any THREE major components found in any electronic circuit. **[6 Marks]**.
- Describe a variable resistor/potentiometer. **[4 Marks]**
- Define the term logic expression in Computer electronics. **[2 Marks]**
- Produce the [Key]/ Description of the logic circuit shown below for a simple mobile phone device. **[8 Marks]**



Section Two (II) Answer any 4 questions

Question Two.

- Use a standard expression to express a machine that is operational if two of the three employees are present.

Note: Use first letters of the alphabet for the inputs and last letter for the output variables.

[5

Marks]

- Define the following logic operators,

- OR (+)
- AND (·)
- NOT (-)

[9 Marks]

- The Output of an AND GATE is true if all its inputs are true. Using A B as inputs and Z as output for 2 input AND gate, Draw its diagram and Truth Table.

[6

Marks]

Question THREE 20 Marks:

a) With help of circuit diagrams discuss the following digital electronic components

- i. Capacitor
- ii. Transistor
- iii. Diode
- iv. Resistor

[8 marks].

b) The output of the AND GATE is true if all its inputs are true, i.e $Z = AB$ (for two inputs)

Draw a simple diagram of AND and show the TRUTH TABLE for a (THREE INPUT GATE)
[12 Marks].

Question FOUR 20 Marks:

a) Derive the standard condition for the truth Table given for the OR Gate.

[5

marks].

A	B	Z
0	0	0
0	1	1
1	0	1
1	1	1



b) Calculate the value for the resistors with the following color codes using the table provided indicating the tolerance value. (Show your Working)

i. RED, RED, BLACK & GOLD

[5 Marks]

[5 marks].

[5 marks]

The standard resistor color code table:

Color	Digit 1	Digit 2	Digit 3*	Multiplier	Tolerance
Black	0	0	0	$\times 10^0$	
Brown	1	1	1	$\times 10^1$	$\pm 1\%$ (F)
Red	2	2	2	$\times 10^2$	$\pm 2\%$ (G)
Orange	3	3	3	$\times 10^3$	
Yellow	4	4	4	$\times 10^4$	
Green	5	5	5	$\times 10^5$	$\pm 0.5\%$ (D)
Blue	6	6	6	$\times 10^6$	$\pm 0.25\%$ (C)
Violet	7	7	7	$\times 10^7$	$\pm 0.1\%$ (B)
Gray	8	8	8	$\times 10^8$	$\pm 0.05\%$ (A)
White	9	9	9	$\times 10^9$	
Gold				$\times 0.1$	$\pm 5\%$ (J)
Silver				$\times 0.01$	$\pm 10\%$ (K)
None					$\pm 20\%$ (M)

** 3rd digit - only for 5-band resistors*

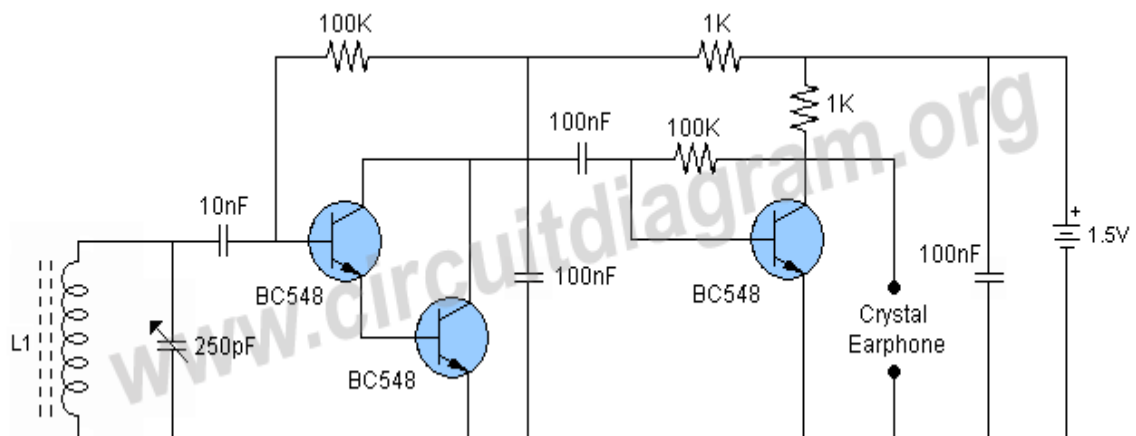
Question FIVE 20 Marks:

- Draw the circuit symbol for A DIODE and give a brief discussion of its construction and operation indicating the PN junction and the depletion layer formation. **[10 Marks].**
- Discuss what you understand by the terms forward Biasing and Reverse biasing in Digital electronics. **[5 Marks].**
- With aid of a good circuit diagrams give the TWO main types of transistors commonly used in circuits. **[5 marks]**

Question SIX 20 Marks:



- Shown above is an XOR Gate, whose output is high if one input is High and low if both the inputs have the same values. Derive its TRUTH TABLE. **[5 Marks].**
- Analyze and discuss the components used in the cct above which is a simple 3 transistor Radio. **[15 Marks]**



Question SEVEN 20 Marks:

- a) With aid of circuit diagrams Discuss any FOUR Semiconductor components within any computer power supply besides those discussed in question One above.

[8

Marks]

- b) Among the Components you named above, Highlight how (TWO) of them are maintained for better performance. **[4 Marks].**
- c) Discuss the two basic areas of applications where variable resistors are used.

[8

Marks]