ELIZADE UNIVERSITY

ILARA-MOKIN

ONDO STATE

FACULTY: Basic and Applied Sciences
DEPARTMENT: Physical and Chemical Sciences
FIRST SEMESTER EXAMINATIONS
2018/2019 ACADEMIC SESSION

COURSE CODE: PHY 313

COURSE TITLE: DIGITAL ELECTRONICS 1

DURATION: 2 HOURS

HOD's SIGNATURE

TOTAL MARKS:

Matriculation Number: _____

INSTRUCTIONS:

1. Write your matriculation number in the space provided above and also on the cover page of the exam booklet.
2. This question paper consists of 2 pages with printing on both sides.
3. Answer all questions in the examination booklet provided.
4. More marks are awarded for problem solving method used to solving problems than for the final numerical answer.
5. Box your final answers.
6. **Attempt any 4 of the 6 questions**

1(a) (i) Differentiate between the following (i) Analog and Digital quantity. (ii) Continuous and Discrete signals.

(b) (i) Convert 11011.1011 to decimal.

(ii) Subtract 28 from 15 using 9's complement, also perform a direct subtraction.

2(a) (i) Convert the following decimal numbers to their 10's complement form (i) 8 (ii) 17 (iii) 52

(ii) Subtract 1011_2 from 1100_2 using the 2's complement method.

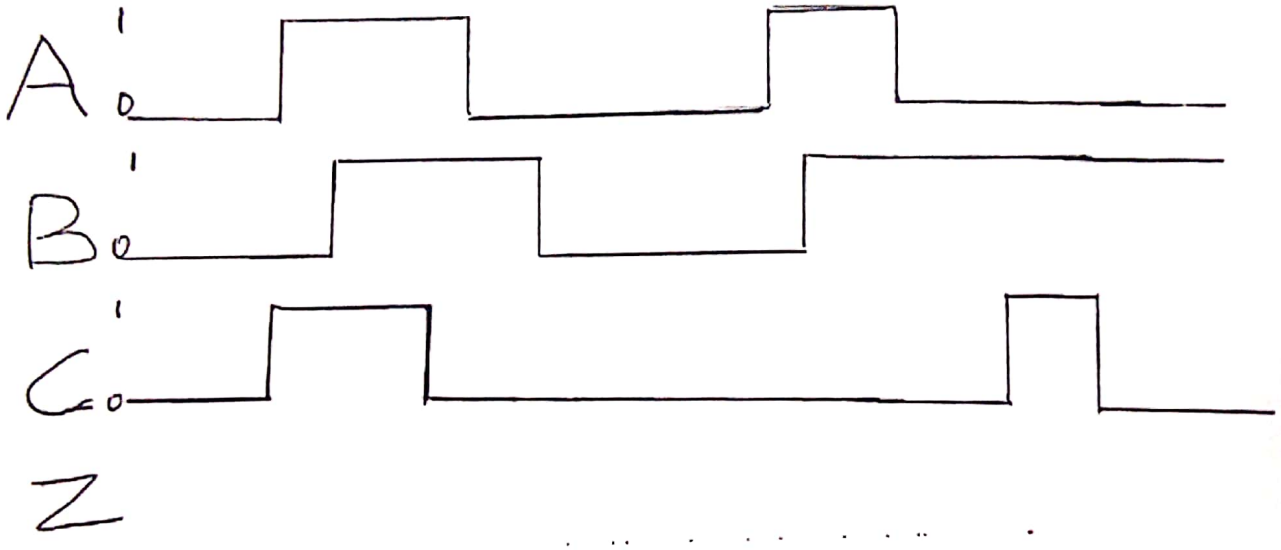
(b) Solve the following Boolean algebra

(i) $\bar{A}\,\bar{B}\,C + A\,\bar{B}\,\bar{C} + \bar{A}\,\bar{B}\,\bar{C} + A\,\bar{B}\,C$

(ii) $A\,B\,C + \bar{A}\,B\,\bar{C} + AD + \bar{A}\,D$

3 (a) Discuss fully the following gates (i) OR (ii) AND (iii) NOT (iv) NAND (v) NOR

(b) Sketch the output waveform Z for the 3 input OR gate if the signals presented at the input are as shown below:



4(a) Discuss using appropriate circuit symbols, truth table and equivalent circuit diagram of

(i) Exclusive OR gate (XOR) (ii) Exclusive NOR gate XNOR

(b) How can exclusive NOR gate be obtained using NAND gate only? Sketch the circuit diagram

5(a) Convert the following function into canonical forms

(i) Y= AB + AC + AD + BCD

(b) Use K-map to simplify the following expression

(i) $Y = AB\bar{C} + A\overline{B\,C} + ABC + A\,\bar{B}\,C$

(ii) $F(a,b,c) = \bar{a}\,b\,c + b\,\bar{c} + ab\,\bar{c} + a\,\bar{b}\,c$

6 (a) (i) What is a combinational logic.

(ii) Distinguish between Sum-of-products and Products-of-Sum.

(b) (i) Briefly discuss the classification of Amplifier

(ii) A 50Ω signal generator with $100mV$ open circuit output voltage produces $70mV$ when connected to an amplifier. This amplifier has an open-circuit voltage gain of 100 and produce 4V across a $1k\Omega$ load . Determine the input and output resistances for the amplifier.