



NATIONAL OPEN UNIVERSITY OF NIGERIA  
PLOT 91, CADASTRAL ZONE, NNAMDI AZIKIWE EXPRESSWAY, JABI - ABUJA  
FACULTY OF SCIENCES

DEPARTMENT OF PURE AND APPLIED SCIENCE

OCT/NOV 2019 EXAMINATIONS

**COURSE CODE:** PHY 405  
**COURSE TITLE:** ELECTRONICS III  
**CREDIT UNIT:** 3  
**TIME ALLOWED:** (2½ HRS)

**INSTRUCTION:** Answer question 1 and any other four questions

**QUESTION 1**

- (a) (i) Convert  $101101.011_2$  to decimal equivalent (2marks)
- (ii) Convert  $27.625_{10}$  to binary equivalent (2marks)
- (iii) Convert  $3BE.1A_{16}$  to decimal equivalent (2marks)
- (iv) Multiply 11011 by 100 (2marks)
- (b) Draw a block diagram of input channels of a dual trace oscilloscope (5marks)
- (c) Mention four(4) major components of general cathode ray tube (CRT) (4marks)
- (d) Draw a diagram of combination of OR and NOT gate (3marks)
- (e) Differentiate between two types of shift registers (2marks)

**QUESTION 2**

- (a) Give three(3) differences between Asynchronous and Synchronous counters (3marks)
- (b) Given a truth table of inputs AND gate, find the outputs Y. (4marks)

Inputs		Outputs
A	B	Y
0	0	?
0	1	?
1	0	?
1	1	?

- (c) Mention three (3) basic logical operators (3marks)
- (d) Mention two (2) universal gates (2marks)

**QUESTION 3**

- (a) With the aid of a diagram explain the circuit for D flip-flop (3mark)
- (b) Mention four(4) types of flip-flop (2marks)
- (c) Find the MSP expression for  $Y = (\bar{A} + \bar{B})\bar{C} + \bar{A}\bar{B}$  (4marks)
- (d) Draw the symbol of half adder (3marks)

**QUESTION 4**

- (a) Draw the symbol of full adder (3marks)
- (b) Explain the term Binary adder (2marks)
- (c) Differentiate between RS and JK flip-flop (3marks)
- (d) Given the truth table of inputs XOR gates, Obtain the Outputs (4marks)

Inputs		Outputs
A	B	Y
0	0	?
0	1	?
1	0	?
1	1	?

**QUESTION 5**

- (a) Explain the basic principle of storage oscilloscope (4marks)
- (b) Differentiate between bits and bytes (2marks)
- (c) What is combination logic? (2marks)
- (d) What is pulse generator? (2marks)
- (e) What is Duty Cycle? (2marks)

**QUESTION 6**

- (a) What is memory? (2marks)
- (b) Differentiate between volatile and non- volatile memory (4marks)
- (c) A user has two memory devices of 10M words of 8-bits size and 2M words of 16-bit size respectively. Which of the two stores more bits? (2marks)
- (d) What is Random Access Memory (RAM) (2marks)
- (e) What is Read Only Memory (ROM) (2marks)