NATIONAL OPEN UNIVERSITY OF NIGERIA
University Village, Nnamdi Azikiwe Expressway, Plot 91, Cadastral Zone, Jabi, Abuja
FACULTY OF SCIENCES
DEPARTMENT OF PURE AND APPLIED SCIENCE
JANUARY 2018 EXAMINATION QUESTIONS

COURSE CODE: PHY405
COURSE TITLE: Electronics III
COURSE UNIT: 3 units
Time: 3 hours

ANSWER QUESTIONS ONE AND ANY FOUR OTHER QUESTIONS

Q.1a. Distinguish between BCD and A5C11 code. (3 marks)
b. State Boolean theorems. (4 marks)
c. With the aid of the diagram, show the realisation of AND, OR and NOT gates from NAND gates. (5 marks)
d. Differentiate between rise time and fall time (3 marks)
ii. State the expression for duty cycle (3 marks)
e. If the time div control is set to 2μ/div and the displayed signal covers 4 div on the Horizontal scale of the cathode ray tube (CRT) screen, determine the frequency of the Signal. (4 marks)

Q.2a. (i) What does MSP mean? (3 marks)
(ii) What are the fundamental rules guiding the use of MSP (3 marks)
b. Find the MSP expression for:
(i) $y = A\bar{B}\bar{C} + AB\bar{C} + ABC$ (3 marks)
(ii) $y = (\bar{A} + \bar{B})\,\bar{C} + \bar{A}\bar{B}$ (3 marks)

Q.3a. State the methods of obtaining the truth table from a Boolean Expression. (4 marks)
b. Sketch and label the following:
(i) Graphic summary of De Morgan's theorems. (3 marks)
(ii) The symbol of (a) half adder (2.5 marks)
(b) full adder (2.5 marks)

Q.4a. Distinguish between RAM and ROM (5 marks)
b. (i) what is register? (3 marks)
(ii) Describe the functioning of shift register (5 marks)

Q. 5 a. Briefly explain with examples signal generator. (4 marks)
b. State the different wave shapes and sketch the waveforms. (5 marks)
c. Write the expression for determining the maximum amplitude of the triangular out, V_{02} (3 marks)

Q.6a. Explain briefly how voltage can be measured with an oscilloscope. (4 marks)
b (i) State six major subsystems of oscilloscope
(ii) What are the four major components of cathode ray tube (CRT) and state their functions.