FOUNTAIN UNIVERSITY OSOGBO, NIGERIA.

P.M.B.4491, OSOGBO, OSUN STATE.

**COLLEGE OF NATURAL AND APPLIED SCIENCES**

**DEPARTMENT OF MATHEMATICAL AND COMPUTER SCIENCES**

SECOND SEMESTER EXAMINATION 2018/2019 SESSION

**CPS 206: COMPUTER HARDWARE Credit Unit/Status: 2 (C)**

**Time Allowed: 2Hr.**  25/06/2019

INSTRUCTION(s): ATTEMPT QUESTION1 AND ANY OTHER TWO (2) QUESTIONS.

*Question1*

1. Explain the following terms in relation to Computer Hardware Design.
2. Logic Gates. **[3mark]**
3. Integrated Circuits. **[3mark]**
4. Karnaugh maps.  **[3mark]**
5. Enumerates the advantages of VLSI Technology with respect to today’s digital world.

**[5mark]**

1. With the aid of an illustration, describe how instructions or programs are executed in the system by the Central Processing Unit (CPU). **[5mark]**
2. Why must System Designer strive to build less complex circuits?  **[3mark]**
3. Make the truth table for the following circuits: **[4mark]**

P

Q

X Z

Y

R

*Question 2*

1. Design a simplified circuit that implements a Voting system for Class representatives of 200 level Computer science students. The class has 3 representatives having different voting weights as follows:

Class Governor: 20mark; Director of Study: 30mark; Assistant Director of Study: 50mark. A decision passes if it gets more than 50mark of votes. **[5mark]**

1. Write short notes on any Three(3) of the following topics:  **[12mark]**
2. Input devices
3. Output devices
4. Computer Memory
5. CPU generations
6. SCSI systems

*Question 3*

1. Assuming the FUO management is planning to install an Alarm Bell in the Server room, to protect it from unauthorized entry, and you are asked to design a digital circuit that will be used to control the Alarm bell. The sensor device provides the following logic signal:

C= 1 when the Control system is active; D = 1 if the Door is closed; M=1 if there is a Motion in the room; and Q = 1 if the motion is open to the public. **[7mark]**

1. Differentiate between the following:  **[10mark]**
2. Primary and Secondary storage
3. Hard disks and Magnetic Tapes.
4. AMD and Intel CPUs.
5. Laser and Inkjet printers

*Question 4*

1. Produce a table containing Summary statistics of the machine that you are using. How much main memory? Does the video display use a separate memory, if so how much? What is the hard disk capacity? What I/O devices are attached? What is the CPU? **[5mark]**
2. A 4-bit binary number is applied to a circuit on four lines **A, B, C,** and **D**. The circuit has a single output, ‘**O**’, which is true if the number is in the range 3-12, inclusive.
3. Draw a truth table for this problem, and obtain a simplified expression for **O** in terms of the inputs. **[8mark]**
4. Implement the circuits in terms of logic gates. **[4mark]**