NATIONAL OPEN UNVERSITY OF NIGERIA
University Village, Plot 91, Cadastral Zone,
Nnamdi Azikiwe Expressway, Jabi, Abuja

FACULTY OF SCIENCES
2021 EXAMINATIONS

CIT711 Computer Fundamentals
Time Allowed: 3 Hours
Credit Units: 3
Instruction: **Answer Question one (1) and any other four (4) Questions.**

1.
   a. From your knowledge of computing, what is Random access memory? Give an example of a device using the technology ***(3 marks)***
   b. Describe the principle of locality ***(2 marks)***
   c. Describe the function of the control unit ***(3 marks)***
   d. Explain what you understand by conditional statement in programming give an statement of a conditional statement ***(4 marks)***
   e. Aminu is considering adding a repetition statement within his final project. He is unsure of the number of times each loop needs to execute. State and explain which loop statement is best for this scenario ***(3 marks)***
   f. Explain what you understand by the following communication switching techniques concepts:
      i. Circuit Switching ***(2 marks)***
      i. Message switching ***(2 marks)***
   g. By using Caesar cipher with a left rotation of four places, decrypt the word COMPUTER ***(3 marks)***

2.

a. Umar currently runs a car rental dealership and wishes to write a program that allows the user to enter the temperature of the location they plan to visit and then recommend a car based on the data. Below is a summary of the program structure Umar is looking for.

Temp greater than 80 a Convertible should be selected.
Temp greater than 60 or less than 80 a SUV should be selected
Temp less than 60 a truck should be selected.
Write down the statements for achieving that ***(5 marks)***

b. Discuss the various generation of programming languages ***(7 marks)***

3.

a. Assume a 4-stage pipelining machine with the following stages FETCH, DECODE, EXECUTE, STORE. If each stage takes 2ns to complete it execution and if each instruction must pass through all stages, how long will it take to execute 100 instructions? ***(6 marks)***

b. State the key differences between RISC and CISC ***(6 marks)***

4.

a. Explain what you understand by protocol and Describe the functionality of the following two layers of the OSI model. ***(2 marks)***
   i. Presentation layer ***(2 marks)***
   ii. Application layer ***(2 marks)***

b. The explain and discuss the advantages and disadvantages of the following network topology. ***(2 marks)***
   i. Bus ***(2 marks)***
   ii. Ring ***(2 marks)***

5.

a. Discuss the functionality of the following LAN Access Method
   i. Carrier Sense Multiple Access with Collision Detection (CSMA/CD) ***(3 marks)***
   ii. Token passing ***(3 marks)***

b. Discus four techniques that can be used to protect a computer from viruses and malware. ***(6 marks)***

6.

a. Explain what you understand by the following operating system concepts:
   i. System Call ***(2 marks)***
   ii. Multiprogramming ***(2 marks)***
   iii. Multitasking ***(2 marks)***

b. Discuss the similarities and differences between a compiler and an interpreter ***(6 marks)***