UNIVERSITY OF ESWATINI

FACULTY OF SCIENCE AND ENGINEERING

DEPARTMENT OF COMPUTER SCIENCE

MAIN EXAMINATION

November 2019

TITLE OF PAPER: COMMUNICATION FUNDAMENTALS

COURSE CODE: CSC121

TIME ALLOWED: 3 HOURS **TOTAL MARKS: 100**

INSTRUCTIONS TO CANDIDATES:

1. All questions carry equal marks.
2. **Question 1 is compulsory.**
3. **Answer any 3 questions from Question 2 to Question 5.**
4. Marks for each question are indicated in square brackets.
5. Show all your workings where necessary.

THIS EXAMINATION PAPER SHOULD NOT BE OPENED UNTIL PERMISSION HAS BEEN GRANTED BY THE INVIGILATOR

Question 1

(a) Define the following terms. [5]

(i) CPU clock speed

(ii) Utility software

(iii) Hyper-threading

(iv) Encapsulation

(v) Primary memory

(b) Discuss the design of the micro ATX motherboard, the advantages and disadvantages that come with the design. [5]

(c) Briefly discuss the fifth generation computers. [3]

(d) What is pipelining? [2]

(e) How much computer storage is required to store the word "CAT"? [1]

(f) Why is it important to document your solutions after you have fixed a computer problem? [2]

(g) List the three main services provided by cloud computing. [4]

(h) List three application layer protocols. [3]

Question 2

(a) What types of peripherals are connected to the northbridge? Give two examples of these. [3]

(b) What is cache memory? List the different types of cache outline how they differ from each other. [6]

(c) Which access method is used to access data on a tape drive? Explain how this access method works. [3]

(d) A computer technician wants to install a graphic card to a computer. He opens the computer and looks for ports to use. What types of ports can the technician use? List two. [2]

(e) Compare and contrast RAM and ROM. [5]

(f) Why does the dynamic RAM require constant refreshing? [2]

(g) Convert "FAT" to the language understood by computer hardware. The ASCII decimal value for A is 65. [4]

Question 3

(a) What is an operating system? [2]

(b) Discuss two functions of the operating system. [4]

(c) Give an example of a GUI based operating system and a CLI based operating system. [2]

(d) Mike has a 64 bit computer which runs a 32 bit Windows 7 OS version. He has a copy of 64 bit Microsoft Office which he intends installing to the computer. Will he be able to install the Microsoft Office software? Why? [4]

(e) What is the function of the hardware abstraction layer? [1]

(f) Briefly outline four operating system installation prerequisites. [8]

(g) Explain how virtual memory can improve the processing speed of a computer. [4]

Question 4

(a) What is the difference between physical and logical topology? [4]

(b) Give one example for each. [3]

(i) Class A address

(ii) Class B address

(iii) Class C address

(c) Explain the operation of the UDP protocol. Give an example of where it is used. [8]

(d) How many bits make up an IPv4 address? [1]

(e) Discuss the four characteristics of a reliable network. [8]

(f) IPv6 uses 128 bit addresses. True or false? [1]

Question 5

(a) How many bits make up IPv6 addresses? [1]

(b) What two advantages does IPv6 have over IPv4? [4]

(c) Discuss the concept of internet of things (IoT). [5]

(d) What is a hypervisor? [1]

(e) Explain the difference between two types of hypervisors. [4]

(f) What is the protocol data unit (PDU) called at each of the following layers? [5]

(i) Application layer

(ii) Transport layer

(iii) Network layer

(iv) Data link layer

(v) Physical layer

(g) With the aid of drawings, differentiate between logical and physical topology the; [5]