UNIVERSITY OF ESWATINI

FACULTY OF SCIENCE AND ENGINEERING

DEPARTMENT OF COMPUTER SCIENCE

RESIT EXAMINATION

SEPTEMBER 2021

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. Answer **ALL** questions. The paper has **FIVE** questions.
3. Marks for each question are indicated in square brackets.
4. 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) Paging file

(ii) Combinational circuit

(iii) Topology

(iv) Arithmetic Logic Unit

(v) CPU size

(b) List four different types of network topologies. [4]

(c) Discuss fifth generation computers. [3]

(d) What is the main difference between system software and application software? [2]

(e) Give two examples of system software which are also utility software and two examples of application software. [4]

(f) Give one example of a minicomputer and one for a microcomputer. [2]

Question 2

(a) State the chipset that connects each of the following. [5]

(i) Peripheral Component Interconnect (PCI)

(ii) Universal Serial Bus (USB)

(iii) Random Access Memory

(iv) Basic Input Output System chip

(v) Accelerated Graphics Port

(b) Discuss the concept of grid computing. [4]

(c) Discuss the three main components of a CPU. [6]

(d) What word does the binary sequence, 010011010110000101101110, represent? [5]

N.B. The ASCII decimal values for character 'A' is 65 and 'a' is 97.

Question 3

(a) Discuss the three functions of an operating system. [6]

(b) Discuss the Power on Self-Test (POST) process. [3]

(c) Mike has a 64bit 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? [3]

(d) State the class of IP addresses each of the following belongs to. [4]

(i) 192.168.10.1

(ii) 10.1.1.2

(iii) 135.78.10.5

(iv) 120.10.1.1

(e) Explain how the double data rate RAM achieves its mandate without tempering with the clock speed? [2]

(f) What are the dangers of overclocking? [2]

Question 4

(a) List and discuss the four properties of a good network. [8]

(b) Differentiate between a router, switch and hub. [6]

(c) Differentiate the two network layer protocols. [6]

Question 5

(a) Give two examples of combinational circuits and two for sequential circuits. [4]

(b) A digital parity checker takes in a bit input and checks the parity of the input. It returns 0 if the number of 1 is odd in the input and 1 if the number of 1s is even. The case where all inputs are 0s is a don't care condition. Implement the reduced circuit of the parity checker. [12]

(c) Implement the circuit of the following function using NOR gates ONLY. [4]

$$f(a,b,c) = ab + \bar{c}$$