UNIVERSITY OF ESWATINI

FACULTY OF SCIENCE AND ENGINEERING

DEPARTMENT OF COMPUTER SCIENCE

MAIN EXAMINATION

DECEMBER 2018

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) Multiprocessing

    (ii) Firmware

    (iii) Utility software

    (iv) Protocol

    (v) Mac address

(b) The most common motherboard is the ATX form factor.

    (i) Explain the advantages of aligning the memory and CPU slots at right angles with the expansion slots. [4]

    (ii) A smaller version of the ATX form factor is the micro ATX form factor. Discuss two disadvantages of the micro ATX form factor. [4]

    (iii) Explain the difference between a nonintegrated motherboard and integrated motherboard. [2]

    (iv) Discuss one advantage of the nonintegrated motherboard over the integrated motherboard. [2]

(c) Would it be possible to install a 64 bit operating system to a 32 bit CPU computer? Explain. [2]

(d) Explain the difference between an IP address and mac address. [2]

(e) Explain 2 advantages of the layered model for implementing the network architecture. [4]

Question 2

(a) Explain how expansion slots can be efficiently added to a new low profile motherboard. [2]

(b) Why does a computer need a CMOS battery? [2]

(c) A computer loses its date and time settings each time it is disconnected from power for some time and plugged back again. What might be the problem with this computer? [2]

(d) Explain the instruction cycle. N.B. Explain the instruction time, execution time and pipelining. [5]

(e) Explain how hyper threading differs from grid computing. [4]

(f) One of the characteristics of a CPU is its clock speed.

    (i) Explain what is meant by CPU clock speed. Give its measurements. [2]

    (ii) What is the disadvantage of increasing clock speed? [2]

    (iii) How does a synchronous dynamic RAM differ from a standard dynamic RAM? [2]

(iv) A DDR SDRAM achieves double data rate at the same clock speed. Explain how this is achieved

without tempering with the clock speed. [2]

(g) What is the power on self-test process? [2]

Question 3

(a) Explain what a user interface is. Discuss the two types of user interfaces, their advantages and/or

disadvantages. [5]

(b) Discuss the concept of virtualization. [3]

(c) State whether each of the following is an operating system software or utility software or

application software. [5]

(i) MS DOS

(ii) Microsoft word

(iii) Sound drivers

(iv) Avira antivirus

(v) Windows 10

(d) The Application Program Interface allows application programs to be hardware independent. Explain

what is meant by hardware independence. [2]

(e) What is the difference between multitasking and multiprocessing? [4]

(f) Explain the concept of virtual memory and how it is used. [5]

(g) Spam filtering is a function of an application software. True or false? [1]

Question 4

(a) Match the seven layers of the OSI reference model with the corresponding TCP/IP layers. [5]

(b) What is the name of the protocol data unit (PDU) at each of the layers of the OSI reference model?

[5]

(c) What are the advantages that come with IPv6 over IPv4? [4]

(d) What is the difference between extranet and internet? [2]

(e) Discuss the dynamic host configuration protocol. Give one advantage of using this protocol. [2]

(f) Explain using an example the process of sending data from one device to another, explaining what happens at each of the layers. [8]

Question 5

(a) Explain three services that are provided by cloud computing. [6]

(b) Discuss the boot-up process. [5]

(c) Explain the difference between UDP and TCP protocols. [4]

(d) ROM is said to be non-volatile. What does this mean? [2]

(e) A technician is trying to install a 64 bit software to a computer. The computer has a 64 bit processor and a 32 bit operating system. Will this process be successful? Explain. [4]

(f) Discuss the use of the following.

   (i) Domain Name Service [2]

   (ii) Dynamic Host Configuration Protocol [2]