COLLEGE OF BUSINESS PEACE, LEADERSHIP AND GOVERNANCE

CSC 302COMPUTER HARDWARE AND SOFTWARE CONCEPTS

END OF SECOND SEMESTER EXAMINATIONS

MAY 2021

LECTURER: MR A.C MUZENDA

DURATION: 7 HOURS

INSTRUCTIONS

Answer all Questions in Section A and any ONE question from Section B
Total possible mark is 100

Start **each** question on a new page in your answer Booklet.

The marks allocated to **each** question are shown at the end of the section.

SECTION A [60 marks]

Answer all questions in this Section

Question 1

a. A company in which you are working has approached you the technician as ask whether to buy UPS or SPS to prevent power blackout. What would you advice them to do and why? [8]

b. Your customer wishes to have a machine configured for both the Linux operating system and Microsoft Windows 7. The computer has only one hard drive. Identify which file system you would recommend and explain the reasons for your choice. [6]

c. You are working in a computer Lab and the fire just started. Outline the safety procedures or steps taken to address the fire problem. [10]

d. Define parallelism and outline and describe the three main architectures using some visual aids. [10]

e. Explain the difference between a von nuemann and havard architecture. Which component in the von Neumann architecture acts as the stage manager. Explain. [6]

f. Outline the function of DMA and describe how the device wishing to perform DMA asserts the processors bus request signal. [8]

g. i. Convert 23_{10} to base 2 [3]

   ii. Convert 1010 1011 to base 16 directly (do not convert to base 10 first). [3]

h. Define parallelism and outline and describe the two main architectures using some visual aids. [6]

SECTION B (40 MARKS)

Answer any ONE question

Question 2

a. Brriefly explain the P-A-S-S basic rules of fire extinguisher operation. [8]

b. You're employed as computer technician at certain company and the management has decided to upgrade their memory from 2Gb to 4Gb of RAM. You are given a task to install new RAM and upgrade the RAM to 4gb. Outline the precautions to be taken when installing the new RAM to avoid ESD. [10]

c. You're employed as computer technician at BrickIT company and one of the employees called, saying she is failing to connect to the intranet network. Educate her on how to perform basic troubleshooting inorder to solve the problem. Also state the possible causes of the problem and suggest the possible solutions. [10]

d. Prove the following Boolean expressions and draw the combinatorial circuit diagrams for the minimized expressions where applicable.

   i. $C + AC + (A+C)(AD + AD) \equiv A + C$ [7]

   ii. $ABC + \bar{A}B + AB\hat{C} \equiv B$ [5]

Question 3

a.Explain what is meant by booting process and clearly outline all the steps that are involved, until the Operating system is in charge. [6]

b. Explain three reasons why it is necessary to partition a hard disk drive (HDD). [6]

c. With the aid of visuals describe the fetch-decode-execute cycle including all related registers. [12]

d. For each of the following errors below. Give the cause and suggest th appropriate solutions

    i.   Failure to connect to the internet [4]

    ii.   Computer continuously freezing [4]

e.   Outline the function of DMA and describe how the device wishing to perform DMA asserts the processors bus request signal. [8]

Question 4

a. With the aid of an example, describe the shortest Job first scheduling algorithm. [8]

b. As an Information Technology expert, you have been asked to design an electronic voting system which is used for SRC elections for the University. Four people take part in the electronic voting D, E, F and G. Each has a button that provides logical input to a circuit. For voting against (input= 0) and input =1 (voting for). Construct a truth table for a circuit to determine the majority vote. Note that D is the chair of the committee and if the vote is evenly split, the chair's vote wins.

   i.   Draw a truth table to represent all voting outcomes. [8]

  ii.   From the truth table, derive an expression for the output of the circuit in its most simplified form. [6]

 iii.   Draw a circuit to implement the voting mechanism using AND, OR and NOT gates. [6]

  iv.   .Explain what is meant by booting process and clearly outline all the steps that are involved, until the Operating system is in charge. [6]

   v.   With the aid of visuals describe the fetch-decode-execute cycle including all related registers. [10]

  vi.   Sometimes, when modifying a document with a word processor, adding text does not increase the apparent size of the file in mass storage, but at other times the addition of a single symbol can increase the apparent size of the file by several hundred bytes. Why? [4]

THE END