UNIVERSITY OF SWAZILAND
FINAL EXAMINATION, DECEMBER, 2016 (SEM-I)

Title of Paper   :   INTRODUCTION TO COMPUTER SCIENCE

Course Code   :   CSC 111

Time allowed   :   Three (3) hours.

Instructions   :

      1. Read all the questions from Page 1 to page 5.

      2. Answer all questions in SECTION-A.

      3. Answer any two questions in SECTION-B.

This paper should not be opened until permission has been granted by the invigilator.

Q1 (a). (5 marks). Starting from the system prompt F:\> , write a sequence of MSDOS commands and correct system prompts to create the following directory tree structure in the root of F: . Assume that the root of F: is empty at the start.
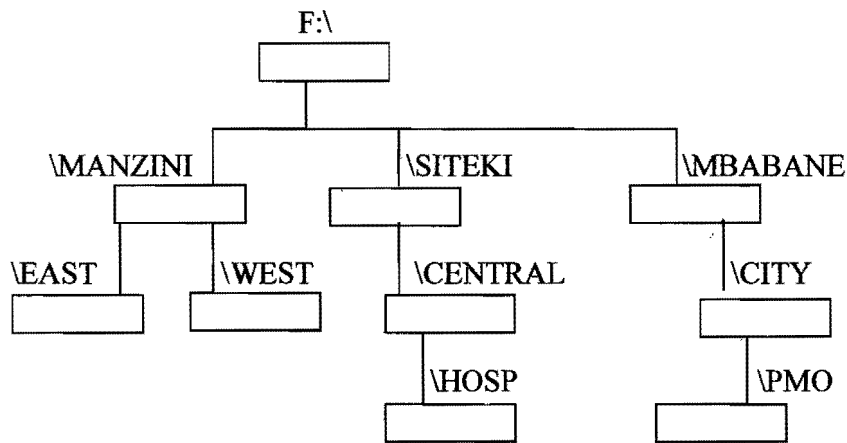
Q1 (b). (5 marks). Explain clearly the file specifications (FS) with examples. In the context of the directory tree of Q1 (a), write two lists of complete directory specifications of - (i) directories which are parent only and (ii) directories which are child only.

Q1(c). (10 marks). Write MSDOS commands along with the correct system prompt to perform each of the following tasks independently. Assume that at the start of each task, the system prompt is F:\>. The context is the directory structure in question 1(a). Answer **any five** of the following. Assume that the display is always on the screen.

(i). Display the contents of EXAMS.TXT which is in the \HOSP.
(ii). Display the contents of \PMO.
(iii). Display the directory information in \WEST starting with the letter W.
(iv). Copy the file MAIN.DOC in \EAST to the file MAIN2.DOC in \CITY
(v). Change the name of the file NEWPRAC.CPP in \MANZINI to OLDPRAC.CPP
(vi). Remove all the files with extension .PIC from \SITEKI

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Q2 (a). (6 marks). The context is MS Word as implemented in the Computer Centre Lab. Explain the steps to do the following -

(i). Assume three paragraphs – para1, para2 and para3 have already been typed. Now

      Align text of para1 to center and change style to italics,
      Align text of para2 to right and change style to bold and underlined
      Align text of para3 to center para3 and toggle.

(ii). Write steps, so that each paragraph, para1, para2 and para3, starts on the first line of a new page without using enter or cut and paste. Now include page numbers.

Q2 (b). (4 marks). Write clear steps of doing the following. Answer **any two** of the following –

(i). Changing the line spacing of a paragraph to 2.0
(ii). Changing the text to strikethrough and its color to light yellow.
(iii). Changing the text in superscript to subscript and subscript to superscript.

Q3 (a). (3 marks). The following formulas are copied from one cell to another. Write the copied formula in the destination cell. Answer **any three** of the following.

    (i).   =$A1*$C2 (is copied from B2 to D3, What is copied in D3?).
    (ii).   =B2*C2 (is copied from A1 to B3, What is copied in B3?).
    (iii).   =A$3+$C3 (is copied from D1 to E4, What is copied in E4?).
    (iv).   =A4*C4 (is copied from D1 to E4, What is copied in E4?).

Q3 (b). (3 marks). Write the rules of copying of your answers to Q3 (a). Also include the type of each cell address appearing in your answers to Q3 (a)

Q3(c). (4 marks). Draw a spreadsheet having data as follows –

1. A1:A5 has data 8, 3, 6, 4, 2 respectively,
2. B2:B5 has data 2, 4, 3, 1 respectively,
3. Contents of C1 are = A1+B2 and D1 are = B2+ C1

The contents of C1..D1 are copied at C2..D4. Write the formulas and values stored in C1..D4.

Q4. (6 + 3 + 6 + 5 marks). A line segment is given by the (x, y) coordinates of its two end points. The length of the line segment is the distance between its end points. There are three categories of line segments; a line segments is –

SMALL - if its length is less than 1.
LARGE – if its length is larger than 10000.
NORMAL - otherwise

Develop the pseudo code of an algorithm to find the length and category of several line segments. It is also required to find the count of line segments in NORMAL category.

All the line segments are to be read interactively and display should be on a text file F:\RESULTS.TXT.

Write the analysis, IPO chart, and pseudo code (declarations + instructions).

Assume that you wish to test your pseudo code for 10 line segments. Write your own test data and results produced when your pseudo code instructions are executed.

SECTION – B
Answer any two questions in this section (show all your work)

Q5 (a). (12 marks). Assume unsigned single byte number representation and

$$P = (177)_{10}, Q = (120)_{10}, R = (10001100)_2 \text{ and } S = (01110101)_2$$

Find binary equivalent numbers of P and Q and decimal equivalent numbers of R and S. Compute (R + S) and verify your result.

Q5 (b). (8 marks). Your subject name, "COMPUTER SCIENCE" is stored at memory location address $(1000)_{16}$ a text information. Write the memory dump depicting the text information. The ASCII code of A = $(65)_{10}$ = $(01000001)_2$ = $(41)_{16}$ and space (or blank character) = $(32)_{10}$ = $(00100000)_2$ = $(20)_{16}$.

Q6 (a). (8 marks). Find the single byte signed binary equivalent of $(47)_{10}$, $(-37)_{10}$, $(100)_{10}$ and $(-100)_{10}$ in

1. Signed magnitude representation and

2. Two's Complement notation

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Q6 (b). (10+2 marks). Showing all your work, Interpret the following 8-bit signed integers

$$A = (0010\ 0111)_2,\ B = (1100\ 0100)_2\ \text{and}\ C = (1000\ 0111)_2.$$

    (i) Using Signed magnitude representation, write the decimal equivalents of
        A, B and C, (A + B) and (B + C), and
    (ii) Using Two's complement notations, write the decimal equivalents of
        A, B and C, (A + B) and (B + C).

Verify and comment over your answers.

Q7 (a). (5 + 5 marks). The order of precedence of basic logical operators is –

1. NOT   2. NAND   3. NOR   4. AND   5. OR

Write the gate symbols and truth tables for each of the above.

Q7 (b). (2 + 8 marks). What is a tautology? Explain the DeMorgans laws for two and more variables with examples.

(End of Examination Paper)