University of Vavuniya

First Examination in Information Technology - 2022

First Semester - January/February 2024

IT1113 Fundamentals of Information Technology (Theory)

Answer Four Questions Only

Time Allowed: Two hours

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1. (a) Briefly describe the uses of Information Technology in the fields of *education*, and *medicine*. [20%]

   (b) Explain the reasons why computers are considered versatile. [10%]

   (c) List the classifications in computer based on the size and describe the uses of each type. [30%]

   (d) Explain the functions carried out by the *hybrid computers* with the aid of an example. [20%]

   (e) Differentiate between *data* and *information*. [20%]

2. (a) Under which category do you classify the touchscreen of a mobile phone. Justify your answer. [20%]

   (b) Differentiate between *Cathode Ray Tube* (CRT) and *Liquid Crystal Display* (LCD) monitors. [20%]

   (c) List down four different types of keyboards and briefly describe their features. [20%]

   (d) State the different mechanisms used in the *Daisy wheel* and *Dot matrix* printers. [20%]

[This question continues on the next page]

(e) In a supermarket checkout, several input and output devices are utilized. Name any two of them and describe their functions. [20%]

3. (a) Draw the logic circuit representing the logic statement $X = (((A.B)+(C.\overline{B}))+\overline{C})$. [15%]

(b) Consider a combinational circuit with three inputs x, y, and z and the three outputs A, B, and C, representing binary integers from 000 to 111 (0 to 7). Here, x is the most significant bit, and z is the least significant bit. Similarly, A is the most significant bit, and C is the least significant bit. When the input is 0, 1, 2, or 3, the output is one greater than the input. Conversely, when the input is 4, 5, 6, or 7, the output is one less than the input.

i. Construct a truth table to show the function of the above mentioned combinational circuit. [15%]

ii. Using the truth table find the logical expression corresponding to each of the outputs A, B and C. [10%]

iii. Simplify the logical expressions obtained using Boolean identities. [30%]

iv. Construct the combinational circuit that could be used to obtain each of the outputs A, B, and C. [30%]

4. (a) Represent the decimal number 5368 in Binary Coded Decimal (BCD). [10%]

(b) What is meant by *"normalized floating point representation"*? [10%]

(c) Find the octal and hexadecimal equivalent for $(110011110110)_2$. [20%]

(d) Evaluate each of the following:

i. $(984)_{10} + (599)_{10}$ using BCD addition.

ii. $(1101001)_2 * (10)_2$

iii. $(10001)_2 - (100)_2$

iv. $(10111)_2 / (10)_2$ [30%]

[This question continues on the next page]

(e) Consider two floating point numbers A and B represented in IEEE-754 single-precision floating point format as follows (in hexadecimal form):

A = C1400000, B = 42100000.

Find the value of A+B in hexadecimal. [30%]

5. (a) Briefly explain the uses of computer networks in business fields. [10%]

(b) List all the essential components of a data communication system. [15%]

(c) Define the following terms:

i. Bandwidth

ii. Protocols

iii. Broadband

[15%]

(d) Briefly explain the three transmission modes in computer networks. [30%]

(e) List three guided transmission media and discuss their pros and cons. [30%]