014

SOUTH EASTERN UNIVERSITY OF SRI LANKA

FIRST EXAMINATION IN BACHELOR OF INFORMATION AND COMMUNICATION TECHNOLOGY - 2015/2016

SEMESTER – I, JULY 2017

CIS 11031 - Logic Designing and Computer Organization

Answer all Questions. **Time: 01 hour.**

Question 01:

a) i. Give 03 (three) different data types used in computer systems. State the main different between **Analog** and **Digital** signals.

(05 marks)

ii. Convert the followings.

a. 498_{10} => Binary number

b. 1101001101_2 => Octal number

c. 763_8 => Hexadecimal number

d. $E8A_{16}$ => Decimal number

(12 marks)

iii. Convert the following fractional numbers into corresponding binary numbers. Answer can be represented up to **3 decimal points** is sufficient.

a. 192.625_{10}

b. 10.534_{10}

(08 marks)

[Total 25 marks]

b) i. Perform the following calculations using **2's complement** of 8 bits.

a. $78_{10} + -59_{10}$

b. $34_{10} - 46_{10}$

(10 marks)

ii. Represent the following decimal value in **single precision** (IEEE 32 bit standard) floating point format.

-118.125_{10}

(09 marks)

iii. In **ASCII** representation method the character '**C**' can be represented as $\mathbf{43}_{16}$, identify the ASCII code for the characters '**A**' and '**E**' in **binary.**

(06 marks)

[Total 25 marks]

Question 02:

a) Answer the following questions based on the given Boolean expression.

$$(ABCD)+(A\overline{B}CD)+(\overline{A}BC)+(ABC\overline{D})+(AB\overline{C}\overline{D})+(\overline{A}\overline{B}CD)$$

i. Map the Boolean expression in a karnaugh map.

(07 marks)

ii. Find the simplified Boolean expression in **SOP** (Sum of Product) format using the karnaugh map.

(06 marks)

iii. Draw the logical circuit diagram using basic logic gates for simplified Boolean expression.

(06 marks)

iv. Get a copy of above karnaugh map, and find the simplified Boolean expression in **POS** (Product of Sum) format using the same karnaugh map (Created for **Question 02: a) i.**).

(06 marks)

[Total 25 marks]

b) **i.** Compare and contrast the combinational and sequential digital circuits. Give 03 (three) examples for each of them.

(05 marks)

ii. Draw the digital circuit diagram and truth table of a **full adder**.

(06 marks)

iii. Differentiate **CISC** (Complex Instruction Set Computing) and **RISC** (Reduced Instruction Set Computing) architectures in computer organization.

(06 marks)

iv. What does it mean by **serial or sequential access memory** in computer memory management?

(08 marks)

[Total 25 marks]