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SOUTH EASTERN UNIVERSITY OF SRI LANKA

FIRST EXAMINATION IN BACHELOR OF INFORMATION AND COMMUNICATION TECHNOLOGY - 2016/2017

SEMESTER – I, SEPTEMBER 2018

CIS 11031(R) - LOGIC DESIGNING AND COMPUTER ORGANIZATION

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

Question 01:

a) State **four** (04) different **number** representation system with their base values.

(8 marks)

b) Differentiate **Analog** and **Digital** signals using suitable **graphs**.

(6 marks)

c) **Convert** the followings by considering the **base values**.

i. 758_{10} - Convert to Octal number

ii. 472_8 - Convert to Binary number

iii. 10010111101_2 - Convert to Hexadecimal number

(12 marks)

d) Perform the following **binary arithmetic calculation**.

i. $110110.1_2 + 11011.01_2$

ii. $11011_2 - 1110_2$

(10 marks)

e) Perform the following calculations in **both 1's complement** and **2's complement** methods using **8 bits** space. Show all **steps** clearly.

$35_{10} + -89_{10}$

(14 marks)

[Total 50 marks]

Question 02:

a) Differentiate **Sum of Product (SOP)** and **Product of Sum (POS)** standard formats of Boolean expression with suitable **example**.

(6 marks)

b) Simplify the following Boolean expressions using **laws and theorems of Boolean algebra**. Show all **steps** with appropriate **laws /theorems** used for simplification.

i. $A + AB + A\overline{C}$

ii. $\overline{(\overline{AB})}.(\overline{A}+\overline{B}).(\overline{B}+B)$

(12 marks)

c) Simplify the following Boolean expressions using the **Karnaugh map**.

$(\overline{A}B).(A\overline{B}C).(ABC)$

(12 marks)

d) What is meant by a **sequential digital circuits**? Give **two** (02) example for **sequential digital circuit**.

(6 marks)

e) Draw the digital **circuit diagram** for **half adder** and **full adder** with appropriate **truth tables**.

(12 marks)

[Total 50 marks]