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051

SOUTH EASTERN UNIVERSITY OF SRI LANKA
FIRST EXAMINATION IN BACHELOR OF INFORMATION AND
COMMUNICATION TECHNOLOGY - 2017/2018
SEMESTER – I, DECEMBER 2019

CIS11032 –Logic Designing & Computer Organization

Answer all Questions

Time: 02 hours

Question 01

a) Convert the following numbers to **Base 2** (Binary)

- I. $3C7D_{16}$
- II. 761_8
- III. 123.0625_{10}

(20 Marks)

b) Represent the following numbers in **Two's complement form**

- I. -9
- II. -25

(20 Marks)

c) **Add** the following binary numbers

- I. $10010 + 1000$
- II. $10111 + 10010$

(20 Marks)

d) **Subtract** the following numbers

- I. $10110 - 10010$
- II. $101111 - 100010$

(20 Marks)

e) Differentiate **Weighted codes** from **Non-weighted codes**. Provide **an example** for each.

(20 Marks)

[100 Marks]

Question 02

a) Find the complement of the expression **A+BC**

(10 Marks)

b) Verify the distribution law **$X(Y + Z) = XY + XZ$** using **Perfect Induction** method.

(15 Marks)

c) Show that,

I. $ABC + \bar{A}B + AB\bar{C} = B$

(20 Marks)

II. $ACD + \bar{A}B\bar{C}D + \bar{A}\bar{B}D + A\bar{B}CD = D(\bar{C} + \bar{B})$

(25 Marks)

d) **$X = \bar{A}BC + B\bar{C} + \bar{B}\bar{C} + ABC$**

I. Minimize the above expression by using **K-map**

(20 Marks)

II. Draw the circuit for the **minimized expression**.

(10 Marks)

Question 03

- List down the basic components of computer. (10 Marks)
- Differentiate **Computer Organization** from **Computer Architecture**. (15 Marks)
- Briefly explain the major components of **CPU** (20 Marks)
- Illustrate "**Instruction Cycle**" using a diagram (10 Marks)
- What is an **Interrupt**? List the **classes of Interrupts**. (15 Marks)
- The following diagram (Fig 1) depicts a fragment of a program where **PC = Program Counter**; **AC = Accumulator (A temporary storage)**; **IR = Instruction Register**.

Explain the following steps in detail.

(30 Marks)

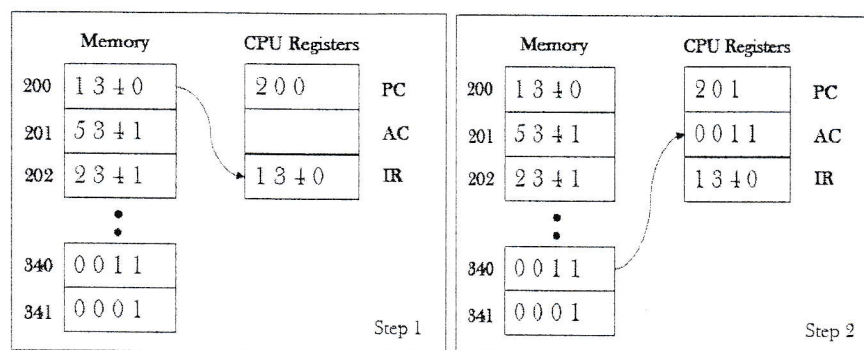


Fig 1. Program Fragment

[100 Marks]

Question 04

- Define **System Bus**. (10 Marks)
- Explain the following statement with suitable example
"The width of the data bus is a key factor in determining overall system performance" (15 Marks)
- Categorize the memory based on **access methods**. Provide a suitable example for each of the category. (25 Marks)
- Draw the **Memory Hierarchy diagram**. Indicate how **cost per bit**, **capacity** and **access time** change **down** the hierarchy. (30 Marks)
- Differentiate **RISC** from **CISC** (20 Marks)

[100 Marks]