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SOUTH EASTERN UNIVERSITY OF SRI LANKA
FIRST EXAMINATION IN BACHELOR OF INFORMATION AND
COMMUNICATION TECHNOLOGY - 2016/2017

SEMESTER – I, SEPTEMBER/OCTOBER 2018

CIS11032 – Logic Designing and Computer Organization

Answer all Questions.

Time Allocated: 02 hours

Question No. 01

A. List two differences between digital computer systems and embedded systems?

(04 Marks)

B. Digital signals could be categorized as synchronous and asynchronous. Briefly explain the differences between them with the aid of a diagram.

(06 Marks)

C. Convert the given numbers with different bases to the given number system.

I. $(754.657)_8$ to Decimal Number System

II. $(AB4)_{16}$ to Binary Number System

III. $(11010.011)_2$ to Decimal Number System

(09 Marks)

D. Perform the following arithmetic operations

I. $(11011)_2 + (1101011)_2$

II. $(1111011)_2 - (11001)_2$

(06 Marks)

[Total: 25 Marks]

Question No. 02

A. Prove $(\overline{A \cdot \overline{B}}) \cdot B = B$ using the method of optional products.

(04 Marks)

B. Plot the following Boolean expressions in a Venn diagram

I. $(A+B) \cdot A$

II. $\overline{(A+B+C)} \cdot C$

III. $\overline{A} + \overline{B} + \overline{C}$

(06 Marks)

C. Using the theorem of boolean algebra (Algebraic Laws), prove the following identities.

I. $\overline{B}(\overline{\overline{B} \cdot \overline{A}}) = A \overline{B}$

II. $\overline{(\overline{A} + B)} \cdot \overline{A} = 0$

(06 Marks)

D. A firm wishes to have their safe protected by an alarm during night time. It must be possible to switch the alarm on and off. The alarm should ring if the safe door opens and it is dark. (Hint: There is possibility for either the room is dark or not and the safe door opens or not)

I. Construct the truth table for the scenario. Clearly mention about any assumptions taken.

II. Obtain the minimal Boolean expression.

III. Design a logic circuit.

(09 Marks)

[Total: 25 Marks]

Question No. 03

A. Define the term **bus**.

(02 Marks)

B. Compare two types of bus, categorized **based on the physical structure**

(06 Marks)

C. What is meant by interrupts? State four possible reasons for an interrupt to occur during an instruction cycle.

(08 Marks)

D. Discuss about the main two steps in the instruction cycle with the aid of a state diagram.

(09 Marks)

[Total: 25 Marks]

Question No. 04

A. Define the term **Unit of transfer in terms of** main memory in computer memory systems.

(02Marks)

B. State two different types of **method of accessing** units of data and briefly explain each.

(04 marks)

C. Briefly explain the followings in terms of computer memory

- I. Access Time
- II. Memory cycle time
- III. Transfer Rate

(09 Marks)

D. Discuss about the memory hierarchy of computer memory system with the aid of a diagram

(10 Marks)

[Total:25 Marks]