6E3042

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B. Tech. VI-Sem. (Old Back) Exam., April/May-2016
Electronic Instrumentation & Control Engineering
6EI6.1 (O) Elective Computer Architecture

Time: 3 Hours

Maximum Marks: 80

Min. Passing Marks (Old Back): 24

Instructions to Candidates:-

*Attempt any **five questions**, selecting **one question from each unit**. All Questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly.*

Units of quantities used/ calculated must be stated clearly.

Use of following supporting material is permitted during examination.

1. NIL _____   2. NIL _____

UNIT-I

Q.1 (a) Explain in detail the different types of instructions that are supported in a typical processor.   rtuonline.com   [8]

(b) Registers R1 and R2 of a computer contain the decimal value 1200 and 2400 respectively. What is the effective address of the memory operand in each of the following instruction?   [8]

(i) ADD

(ii) SUB

OR

Q.1 (a) Register A holds the 8- bit binary number 11011001. Setermine an operand B and the micro operation to be performed on A & B in order to change the value in A to -

(i) 01101011   [4]

(ii) 11110101   [4]

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(b) Discuss the various register shift operations. Starting from an initial value of R=11011011, determine the sequence of binary values in R after a logical shift left, followed by a circular shift right, followed by a logical shift left. [8]

UNIT-II

Q.2 (a) What is a stack? Illustrate the use of stack in subroutine processing with suitable program. [8]

(b) Describe different types of addressing modes in details. [8]

OR

Q.2 (a) Explain the execution of an instruction with diagram. [8]

(b) Explain multiple bus organization in detail. [8]

UNIT-III

Q.3 (a) Give the block diagram of the hardware implementation of addition and subtraction of signed number and explain the operations with flowchart. [8]

(b) Explain the representations of floating point numbers in detail. [8]

OR

Q.3 (a) Design the array multiplier that multiplies two 4-bit numbers. [8]

(b) Describe the algorithm for integer division with suitable examples. [8]

UNIT-IV

Q.4 (a) What is the role of address sequencer in micro-programmed control unit? Explain with the help of block diagram and truth table the working of address sequencer for control memory. [16]

OR

Q.4 (a) What are the general attributes of horizontal and vertical micro instructions. [8]

(b) With the help of a neat block diagram discuss the hardware associated with control memory for selecting the next micro instruction address. [8]

UNIT-V

Q.5 (a) What is virtual memory? Explain how the logical address is translated into physical address in the virtual memory system with a diagram. [8]

(b) Describe the organization of a typical RAM chip. [8]

OR

Q.5 (a) Design a parallel priority interrupt hardware for a system with eight interrupt sources. [8]

(b) What is the importance of an I/O interface? Compare features of SCSI and PCI interfaces. [8]

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