

6E3042

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Total No of Pages: 2

6E3042

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:-

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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. Determine 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]

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- 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

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- 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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