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No. of Printed Pages—3 CS–401

# B. TECH.

## FOURTH SEMESTER EXAMINATION, 2002-2003

## COMPUTER ORGANIZATION

*Time : 3 Hours* *Total Marks : 100*

**Note** : Attempt **ALL** the questions.

**1.** Attempt any FOUR of the following :— **(5×4=20)**

(*a*) Discuss various number systems.

(*b*) Describe different numeric codes.

(*c*) Differentiate between ASCII and EBCDIC codes.

(*d*) Perform the following conversions :—

(*i*) $(8620)_{10} \rightarrow (\quad)_2$

(*ii*) $(CDFE)_{16} \rightarrow (\quad)_2$

(*iii*) $(2489)_{10} \rightarrow (\quad)_8$

(*iv*) $(1101110.01)_2 \rightarrow (\quad)_{10}$

(*v*) $(572)_8 \rightarrow (\quad)_{16}$

(*e*) Explain the following with reference to floating point representation :—

(*i*) IEEE standard

(*ii*) Normalization

(*iii*) Biasing

(*iv*) Overflow & Underflow

(*f*) Using Karnaugh map, obtain simplified expression for the following Boolean function :—

$F(W, X, Y, Z) = \Sigma(0,2,4,6,8,10,12,14,15)$

2. Attempt any FOUR of the following :— (5×4=20)

(*a*) Design and discuss a four-bit bidirectional shift register.

(*b*) Design a counter which counts as follows :

000
001
010
011 } The sequence repeats
100
101
110

(*c*) Using full adder, design a four-bit adder/ subtractor circuit.

(*d*) Design a logic circuit which can perform four logic operations.

(*e*) Instruction cycle is divided into subcycles. With the help of diagram, explain the sequence in which subcycles are executed.

(*f*) Discuss how address sequencing is carried out in microprogrammed control organization.

3. Attempt any TWO of the following :— (10×2=20)

(*a*) Discuss different types of RAM. How many 128 bytes RAM chips are required to provide a memory of 2048 bytes ? Show details of connections, clearly indicating address, data and decoder configuration.

(*b*) Discuss construction and working of a magnetic disk. Also discuss various components of disk access time.

(*c*) Describe various modes of data transfer. Also discuss how DMA mode is better than other modes.

4. Attempt any TWO of the following :— (10×2=20)

(*a*) What do you understand by assembly language? Enumerate the advantages of assembly language programming over machine language. Also discuss main disadvantages of using assembly language.

(*b*) Write an assembly program to evaluate the arithmetic statement —

$$X = (A + B * C) / (D - E * F + G * H)$$

(*i*) using general register type computer with three address instructions,

(*ii*) using stack based computer with zero address instructions.

(*c*) Write an assembly language programme for addition of two 3x3 matrices. The matrices are stored in the form of lists (row wise). Store the result of addition in the third list.

5. Attempt any TWO of the following :— (10×2=20)

(*a*) What do you understand by level of memory hierarchy? Discuss various design considerations of memory hierarchy.

(*b*) Give Flynn's classification of parallel computer architecture. Also discuss each class in brief.

(*c*) Describe vector processor and array processor. Also explain their similarities and differences.