



2019/TDC/EVEN/CSCHC-201T/044

TDC (CBCS) Even Semester Exam., 2019

COMPUTER SCIENCE

(2nd Semester)

Course No. : CSCHCC-201T

(Computer System Architecture)

Full Marks : 70

Pass Marks : 28

Time : 3 hours

The figures in the margin indicate full marks for the questions

Answer **all** questions

UNIT—I

1. Answer any *two* questions from the following : 2×2=4

(a) List the truth table of a three-variable exclusive OR (odd) function :

$$x = A \oplus B \oplus C$$

(b) Simplify the boolean functions using four-variable maps :

$$F(A, B, C, D) = \Sigma(0, 1, 2, 4, 5, 7, 11, 15)$$

(c) What is multiplexer? Give example.



(2)

2. (a) Explain clocked Rs flip-flop and T flip-flop. 5

(b) Design a full-adder circuit using two half-adder and an OR gate. 5

OR

3. (a) Simplify the boolean function F together with the don't care conditions d in

(i) sum of products form

(ii) product of sums form

$$F(w, x, y, z) = \Sigma (0, 1, 2, 3, 7, 8, 10)$$

$$d(w, x, y, z) = \Sigma (5, 6, 11, 15)$$

(b) Write short notes on the following : 5
 $2\frac{1}{2} + 2\frac{1}{2} = 5$

(i) Shift register

(ii) Binary counter

UNIT—II

4. Answer any two of the following questions :

2x2=4

(a) Convert $(41.6875)_{10}$ to binary.

(b) Find the 10's complement subtraction of $72532-13250$.

(c) How can floating point number be represented in computer system?

(3)

5. (a) Write an algorithm for addition and subtraction of signed magnitude numbers. 7

(b) Represent the decimal number 8620 to the following bases : 3

(i) BCD

(ii) Excess-3 code

(iii) 2421 code

OR

6. (a) Explain with an example Booth's multiplication algorithm of signed 2's complement number. 7

(b) What is the difference between fixed point and floating representation? 3

UNIT—III

7. Answer any two of the following questions :

2x2=4

(a) Define micro-operation with example. 11

(b) Define hardwired control and micro-programmed control

(c) Write short notes on control unit.



(4)

8. (a) Describe the flowchart of instruction cycle. 5

(b) Design a 4-bit bus system and draw the diagram. 5

OR

9. (a) Briefly define basic instruction formats. 3

(b) Briefly describe the functions of computer registers. 7

UNIT—IV

10. Answer any two of the following questions : 2×2=4

(a) What is control word? Give example.

(b) Write down the purpose of stack pointer.

(c) What is program counter?

11. (a) What are the different addressing modes? Explain with an example. 7

(b) Write down the difference between RISC and CISC. 3

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(Continued)

(5)

OR

12. Write a program to evaluate the arithmetic statement

$$X = \frac{A - B + C * (D * E - F)}{G + H * K}$$

(a) Using a general register, compute with three address instructions. 5

(b) Using a general register, compute with two address instructions. 5

UNIT—V

13. Answer any two of the following questions : 2×2=4

(a) What are start bit and stop bit?

(b) What is interrupt?

(c) Define DMA.

14. (a) Explain DMA controller with block diagram. 5

(b) Explain the asynchronous mode of data transfer with diagram. 5

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(Turn Over)



(6)

OR

15. (a) Explain with diagram, the functions of interrupt controller. 5

(b) What is the difference between isolated I/O and memory mapped I/O? What are the advantages and disadvantages of each? 3+2=5
