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 :

$x \quad A \quad B \quad C$

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

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

(c) What is multiplexer? Give example.

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

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

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

(b) Write short notes on the following : 2½+2½=5

(i) Shift register

(ii) Binary counter

UNIT—II

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

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 : 2×2=4

(a) Define micro-operation with example.

(b) Define hardwired control and micro-programmed control

(c) Write short notes on control unit.

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

OR

12. Write a program to evaluate the arithmetic statement

$$X \quad \frac{A \quad B \quad C \quad (D \quad E \quad F)}{G \quad H \quad K}$$

(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

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

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