TDC (CBCS) Even Semester Exam., 2024

COMPUTER APPLICATION

(2nd Semester)

Course No. : CACCC–202T

(Computer System Architecture)

Full Marks : 70
Pass Marks : 28

Time : 3 hours

The figures in the margin indicate full marks for the questions

UNIT—I

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

(a) Implement AND gate using only NOR gates.

(b) State the principle of duality.

(c) What is multiplexer? Give example.

2. Answer any *one* question : 10

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

(ii) Draw and design 8-to-1 line multiplexer. 5

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

1. Shift register
2. Binary counter

(ii) 1. Minimize the following Boolean function using K-map : 2

$$F = \Sigma m (1, 2, 3, 5, 6, 7)$$

2. Explain master-slave flip-flop. 3

UNIT—II

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

(a) Convert $(41{\cdot}6875)_{10}$ to binary.

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

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

4. Answer any *one* question : 10

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

(ii) What is the difference between fixed point and floating point representation of a number? 3

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

1. BCD
2. Excess-3 code
3. 2421 code

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

UNIT—III

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

(a) Define micro-operation with example.

(b) Write a short note on control unit.

(c) Define hardwired control and microprogrammed control.

6. Answer any *one* question : 10

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

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

(b) (i) Briefly define basic instruction formats. 3

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

UNIT—IV

7. 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?

8. Answer any *one* question : 10

(a) *(i)* What are the different addressing modes? Explain these with examples. 7

(ii) Write down the differences between RISC and CISC. 3

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

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

(i) using general register, compute with three address instructions;

(ii) using general register, compute with two address instructions. 5+5=10

UNIT—V

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

(a) What are start bit and stop bit?

(b) What is interrupt?

(c) Define DMA.

10. Answer any *one* question : 10

(a) *(i)* Explain the asynchronous mode of data transfer with diagram. 5

(ii) Explain DMA controller with block diagram. 5

(b) *(i)* Explain with diagram, the functions of interrupt controller. 5

(ii) 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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