



2019/TDC/EVEN/BCACC-202T/008

DC (CBCS) Even Semester Exam., 2019

# COMPUTER APPLICATION

( 2nd Semester )

Course No. : BCACC-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

Answer any two from the following : 2×2=4

(a) Demonstrate by means of truth table of the validity of the De Morgan's theorems for three variables. 2

(b) Obtain the simplified expressions in sum of products using three-variable map

$$F(x, y, z) = \Sigma(0, 1, 5, 7) \quad 2$$

(c) Explain canonical and standard forms of Boolean algebra. 2



2. Answer any one from the following :

10

(a) Given Boolean function

$$F = xy + x'y' + y'z$$

(i) Implement it with AND, OR and NOT gates.

(ii) Implement it with only OR and NOT gates.

(iii) Implement it with only AND and NOT gates.

2+4+4=10

(b) (i) Explain full adder with logic diagram.

(ii) Explain D flip-flop with the working principle.

(iii) Draw the logic diagram of 4x1 multiplexer.

(iv) What is binary counter? 3+2+3+2=10

### UNIT—II

3. Answer any two from the following :

2x2=4

(a) Convert the hexadecimal 2ACS.D to octal and binary.

2

(b) Perform the subtraction with the binary numbers using 2's complement

$$[100]_2 - [110000]_2$$

2

(c) What is Gray code? Give example.

2



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4. Answer any one from the following : 10

(a) (i) Explain flowchart for add and subtract operations of signed magnitude data.

(ii) How is floating-point number represented in computer system?

7-3-10

(b) Draw the flowchart of Booth algorithm for multiplication of signed 2's complement numbers. Multiply  $(-9) \times (-13)$  using Booth algorithm. 3+7=10

UNIT—III

5. Answer any two from the following : 2\*2=4

(a) What is register transfer language? Give example. 2

(b) Draw the block diagram and timing diagram for the given microoperation

$$P: R2 \leftarrow R1$$

2

(c) Define register reference instruction and input-output instruction. 2



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6. Answer any one from the following : 10

(a) What is a program interrupt? Explain the process of interrupt cycle. 5+5=10

(b) With a neat block diagram of a control unit, explain its component. Also show the timing signals with clock pulses.

7+3=10

#### UNIT—IV

7. Answer any two from the following : 2×2=4

(a) An 8-bit register contains the binary value 10011100. What is the register value after an arithmetic shift right? 2

(b) How do selective-set and selective-clear work? 2

(c) What is reverse polish notation (RPN)? Give example. 2

8. Answer any one from the following : 10

(a) Explain general register organization with block diagram and control word. 10

(b) Explain different addressing modes of the instruction. 10



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UNIT—V

9. Answer any two from the following :  $2 \times 2 = 4$

(a) What is interrupt? 2

(b) What is cycle stealing? 2

(c) What is input-output processor? 2

10. Answer any one from the following : 10

(a) (i) How does DMA work? Explain using diagram.

(ii) Explain strobe control method of asynchronous data transfer.  $5+5=10$

(b) (i) Explain different modes of data transfer.

(ii) What is the difference between isolated I/O and memory-mapped I/O?

(iii) What are the advantages of isolated I/O and memory-mapped I/O?

$5+3+2=10$

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