

TDC (CBCS) Even Semester Exam., 2019

COMPUTER APPLICATION

(2nd Semester)

Course No. : BCADSC-201T/BCAGEC-201T

(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* 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

$F(x, y, z)$ (0, 1, 5, 7) 2

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

J9/2130

(Turn Over)

2. Answer any *one* from the following : 10

(a) Given Boolean function

$$F = xy + x\bar{y} + yz$$

(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 4 1 multiplexer.

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

UNIT—II

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

(a) Convert the hexadecimal 2AC5 *D* to octal and binary. 2

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

$$(100)_2 - (110000)_2 \quad 2$$

(c) What is Gray code? Give example. 2

J9/2130

(Continued)

(3)

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) (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
- $P: R2 \quad R1$ 2
- (c) Define register reference instruction and input-output instruction. 2

(4)

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

(5)

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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