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BCA-01

Computer Fundamental and Introduction to Digital Logic

Bachelor of Computer Application (BCA-11/16/17)

First Semester, Examination 2019

Time : 3 Hours **Maximum Marks : 80**

Note : This paper is of Eighty (80) marks divided into three (03) sections.A, B and C. Attempt the questions contained in these sections according to the detailed instructions given therein.

Section –A

(Long Answer Type Questions)

Note : Section 'A' contains four (04) long answer type questions of Nineteen (19) marks each. Learners are required to answer any two (02) questions only.

(2×19 = 38)

Q1: Answer the following questions:

a. What is a Computer? Draw the schematic block diagram of a computer showing its essintial components and explain the function of each component. 08

b. What are logic gates? Explain AND gate and draw the schematic block diagram of a 3 – input AND gate with its truth table. 08

c. Convert $(0.5A6B)_{16}$ to its decimal equivalent. 01

d. Convert $(125)_{10}$ to its binary equivalent. 01

e. Calculate 2's complement of the binary number 101100. 01

Q2: Answer the following questions.

a. Explain flip –flop with its function. Draw the schematic diagram of a JK flip flop with its working principle. 07

b. Using DeMorgan's theorem, show that: 07

- (A+B)'(A'+B')' =0
- A'B+A'B' =1

c. Derive the control gates associated with the program counter PC in the basic computer. 2.5

d. Explain the difference between NAND or NOR? 2.5

Q3: Answer the following questions:

a. What is CPU? Discuss the role of CPU in a computer system. 07

b. What is the difference between counter and registor? 07

c. Define the term RAM and ROM with their merits, demerits and area of applications. 05

Q4. Answer the following questions:

a. Explain the word 'peripheral' with the help of example? Discuss the function of input and output devices with example. 07

b. Explain the function of Address Bus, Data Bus and Control Bus. 07

c. What are truth tables? Explain with suitable examples. 05

Section – B

(Short Answer Type Questions)

Note : Section 'B' contains eight (08) short answer type questions of Eight (08) marks each. Learners are required to answer four (04) questions only. (4x8=32)

Q1: What are the Boolean theorems? Discuss their usefulness in respect to logic design.

Q2: Simplify the following expression using Boolean algebra.

a. A+AB
b. AB +AB'
c. A'BC+AC
d. A'B+ABC'+ABC

Q3: Draw the block diagram of a dual 4 to 1 line multiplexers and explain its operation by means of a function table.

Q4: Answer the following questions:

a. Subtract binary number 01.11 from 10.00
b. Subtract binary number 001 from 100.
c. Add binary number 11.10 to 01.11.
d. Add binary number 10110 to 00110.

Q5: Represent the following numbers using floating point notation. (Assusme 16 bit word)

a. 10110.1101
b. 11011100.10
c. 0.000011011011

Q6: Prove that (A EOR B) EOR C=A (B EOR C).

Q7: What is flash memory? Explain the two types of flash memory and compare their characterstics.

Q8: Write short notes on following:

a. Encoder
b. Full adder
c. Decoder
d. EBCDIC

Section –C

(Objective-type-questions)

Note : Section 'C' contains ten (10) objective type questions of one (01) mark each. All the questions of this section are compulsory. (10X1=10)

1. 2's complement of 11001011 is

(a) 01010111 (b) 11010100

(c) 00110101 (d)11100010

2. In boolean algebra, the OR operation is performed by which properties.

(a) Associative Properties (b) Commutative properties

(c)Distributive Properties (d) All of the above

3. A(A+B) =?

(a) AB (b) 1

(c) (1+AB) (d)A

4. The NOR gate output will be high if the two inputs are

(a) 0 0 (b) 01

(b) 10 (d) 11

5. Which of the following is a universal logic gate

(a) OR (b) AND

(c) NAND (d) XOR

6. BCD stands for

(a) Binary Coded Decimal (b) Binary Coded Document

(c) Binary Carry Decimal (d) None of the above

7. Any negative number is recognized by its

(a) LSB (b) MSB

(c) Bits (d) Nibble

8. Whose operations are more faster among the following

(a) Combinational Circuits (b) Sequential Circuits

(c) Latches (d) Flip-Flops

9. In a multiplexer, the selection of a particular input line is controlled by

(a) Data Controller (b) Selected Circuits

(b) Logic Gates (d) All of the above

10. ROM stands for ?

(a) Read only memory (b) Random only memory

(c) Rear only memory (d) Read only music

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