

Roll No.

BCA–01

Computer Fundamental and Introduction to Digital Logic

Bachelor of Computer Application

(BCA–16/BCA–11)

First Semester, Examination, 2017

Time : 3 Hours

Max. Marks : 70

Note : This paper is of **seventy (70)** marks containing **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 fifteen (15) marks each. Learners are required to answer *two* (02) questions only.

1. Answer the following questions :
 - (a) What is CPU ? What are its components ? Explain.
 - (b) Describe the construction and working of full-adder.
 - (c) Perform the following operations :
 - (i) Subtract $(10111001.11)_2$ from $(110011110001.01)_2$

- (ii) Find the 9's complement of $(564610)_{10}$
 - (iii) Find the 1's complement of $(10110110)_2$
 - (iv) Find the 10's complement of $(1012398)_{10}$
 - (v) Find the 2's complement of $(0110111)_2$
2. Answer the following questions :
- (a) Explain the working of AND, OR, NOT and XOR Gate with truth table and diagram. How are they useful ?
 - (b) Discuss Universal Gates. Create NAND Gate using NOR Gate only. Create NOR Gate using NAND Gate only.
 - (c) What are pointing devices ? Discuss some of the commonly used pointing devices.
3. Explain all the Generations of Computers with technology used.
4. (a) Explain the function of a multiplexer.
- (b) Explain types of Memory.
 - (c) Explain the following :
 - (i) Bus
 - (ii) Optical Disk
 - (iii) LAN
 - (iv) Volatile memory
 - (v) Non-volatile memory

Section-B**(Short Answer Type Questions)**

Note : Section 'B' contains eight (08) short answer type questions of five (5) marks each. Learners are required to answer *six* (06) questions only.

1. What are Registers ? Explain any register with functioning and diagram.
2. Explain De-Morgan's theorem with example and truth table.
3. Implement the following with a multiplexer :
 $F(A, B, C, D) = \Sigma (0, 1, 3, 4, 8, 9, 15)$
4. What is sequential circuit ? How does it differ from combinational circuit ?
5. What is Flip-flop ? Why is it used ? Explain any kind of Flip-flop with diagram.
6. Explain Encoder and Decoder with working and block diagram.
7. Explain Synchronous and Asynchronous Counter.
8. What are input devices and output devices ? Explain any *three* input devices and any *three* output devices.

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.

1. AND operation is equivalent to :
 - (a) Division
 - (b) Union
 - (c) Intersection
 - (d) Both (b) and (c)

2. In Boolean algebra, OR is represented by :
 - (a) +
 - (b) -
 - (c) /
 - (d) ×
3. LSI means :
 - (a) Large Symbol Integration
 - (b) Large Scale Integration
 - (c) Large Symbol Invertor
 - (d) Large Scale Invertor
4. Truth table is used to express :
 - (a) Boolean expression
 - (b) Boolean map
 - (c) Boolean matrix
 - (d) Boolean addition
5. Complement of NOR and OR gates is and respectively.
 - (a) AND, NAND
 - (b) NAND, AND
 - (c) OR, NOR
 - (d) NOR, OR
6. A binary number system is of base
 - (a) 1
 - (b) 2
 - (c) 4
 - (d) 10

7. Convert the binary number (1111000011110000) to hexadecimal number :
- (a) 1010
 - (b) F0F0
 - (c) 7070
 - (d) 5050
8. Maximum number in decimal that can be represented by 4 bit (binary) is :
- (a) 4
 - (b) 7
 - (c) 15
 - (d) 16
9. 1's Complement of 11001010 is :
- (a) 11001011
 - (b) 11001001
 - (c) 00110101
 - (d) 00110111
10. 2's Complement of 10101011 is :
- (a) 01010101
 - (b) 00111100
 - (c) 10101011
 - (d) 10101100

