

REV-01  
BCA/12/22

2023/01

**BACHELOR OF COMPUTER APPLICATION  
FIRST SEMESTER  
DIGITAL LOGIC AND DESIGN  
BCA-102**

**SET  
A**

[USE OMR SHEET FOR OBJECTIVE PART]

Duration: 1 hrs. 30 Mins

Full Marks: 35

**(Objective)**

Time: 15 mins.

Marks: 10

Choose the correct answer from the following:

1×10=10

- The Base of Octal number system is
  - 6
  - 15
  - 16
  - 8
- How many NAND gates are required to construct an OR gate?
  - 2
  - 3
  - 1
  - 4
- Which of the following is not a kind of system software?
  - Unix
  - Bios software
  - Microsoft Windows
  - Microsoft Word
- The binary equivalent of decimal number  $(5)_{10}$  is
  - 101
  - 110
  - 011
  - 111
- In 4:1 MUX, the number of select line is
  - 3
  - 2
  - 1
  - 4
- DEMUX is also called
  - Data distributor
  - Data selector
  - Data analyzer
  - none
- The 2's compliment of the number 10101101 is
  - 01010010
  - 11010010
  - 01010011
  - 11010111
- Which of the following is responsible for arithmetic and logic operations?
  - ALU
  - CPU
  - Memory
  - All of these
- CPU consists of
  - ALU & Memory
  - ALU & Control Unit
  - Control Unit & Memory
  - All of these

- 10 The hexadecimal form of the binary number 11111010 is
- a. AF
  - b. EA
  - c. CD
  - d. FA

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**( Descriptive )**

Time : 1 hrs. 15 mins.

Marks : 25

[ Answer question no.1 & any two (2) from the rest ]

1. What is Subtractor?. Realize a half-Subtractor circuit with the help of truth table. 2+3=5
  
2. (a) What do you mean by De-multiplexer? Design 1:4 DEMUX with the help of truth table. 5+5=10  
(b) What is Universal gate? Construct an AND gate using NOR gate only.
  
3. a. Find the binary equivalent of the decimal number ( 20.275)<sub>10</sub>.  
b. Convert ( 111011.011)<sub>2</sub> into decimal. 3+3+4=10  
c. Subtract (10)<sub>10</sub> from (15)<sub>10</sub> using 1's complement method.
  
4. (a) Explain the architecture of a computer with the help of block diagram. 5+5=10  
(b) Design an Encoder circuit.
  
5. Write short notes on the followings:  
(a) Multiplexer. 5+5=10  
(b) Computer software.

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