



Code : 20CS11T

**1139**

Register  
Number

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I Semester Diploma Examination, August/September-2022

## FUNDAMENTALS OF COMPUTER

Time : 3 Hours ]

[ Max. Marks : 100

- Instructions :** (i) Answer **one** full question from each Section.  
(ii) One full question carries **20** marks.

### SECTION - I

- List any three (3) features of a number system. List any two number systems with an example each. 5
  - State any one (1) Demorgan's Boolean Law and verify using truth table. 5
  - Apply 2's-complement method to subtract  $1001_{(2)}$  from  $1101_{(2)}$ . 5
  - Why 'NAND' is called as "Universal gate" ? With neat diagram, explain how we can obtain 'OR' gate using 'NAND' gate only ? 5

### OR

- What is a Logic gate ? List any three (3) logic gates with their logic symbols. 5
  - Convert the following : 5
    - $999_{(10)}$  to octal
    - $10101111_{(2)}$  to hexadecimal
    - $123.77_{(8)}$  to binary.
  - Find Excess-3 code, ASCII code BCD code for  $149_{(10)}$ . 5
  - Given expression  $A + \bar{A}B = A + B$ . Verify using truth table. 5





## SECTION - II

3. (a) Solve the expression using Boolean laws : 5

$$A \cdot B \cdot \bar{C} + B \cdot C + \bar{A} \cdot B \cdot \bar{C} + \bar{A} \cdot C \cdot \bar{C}$$

- (b) What is a Flip flop ? List different types of Flip flops. List any two (2) applications of flip flops. 5
- (c) Differentiate between combination circuits and sequential circuits. 5
- (d) Draw 4 : 2 Encoder circuit diagram and its truth table. 5

## OR

4. (a) (i) Find 1's complement of  $01011_{(2)}$ . 5
- (ii) Find 2's complement of  $11011_{(2)}$ .
- (b) What is a Shift Register ? List its types. List any two (2) applications of Shift Registers. 5
- (c) Explain Comparator circuit with its circuit diagram and truth table. 5
- (d) Consider clock signal used in digital circuits. Explain the following terms : 5
- (i) Clock frequency                      (ii) Clock period
- (iii) Falling edge of clock              (iv) High-level of clock signal

## SECTION - III

5. (a) Construct Full-Adder using Multiple half adders. Deduce expression for 'SUM' and 'CARRY' terms. 5
- (b) A 4 bit shift register is used to shift a nibble of data. The shift register operates at a Time period (T) of 5 ms (milliseconds). Analyze the time taken to shift this data nibble using 'SISO' shift register. 5
- (c) List any four applications (4) of computers. 4
- (d) Explain the working of a Keyboard with neat diagram. 6

## OR





6. (a) Construct Full subtractor using multiple half subtractor. Deduce expression for 'Difference' & 'Borrow' terms. 5
- (b) For 4 : 1 Multiplexer, 5
- (i) How many number of Inputs given ?
- (ii) How many number of output taken ?
- (iii) What is the purpose of select line ?
- (iv) Draw the block diagram with above details.
- (c) List any two (2) significant features of different generation of computers. 4
- (d) Compare LAN, MAN and WAN categories of network. 6

**SECTION – IV**

7. (a) Suppose you are browsing on unsecured website. Determine any three security threats you may face while browsing it. Also suggest any two (2) measures to deal with security threats. 8
- (b) Draw neat diagram and explain various functional units of computers. 6
- (c) Explain the Flynn's classification of computers, with any two (2) features of each class. 6

**OR**

8. (a) Suppose there are four (4) departments in your college, each having fifty (50) computers. You want to connect all computers by networking. Identify the following network design consideration 8
- (i) Category of Networking
- (ii) Networking devices needed and their position
- (iii) Network topology
- (b) List different types of memory and arrange in the hierarchy of increasing access speed. Give the application of each memory. 6
- (c) What is BIOS in computer ? List any four (4) differences between BIOS and UEFI. 6



[Turn over



## SECTION - V

9. (a) Bring out any four (4) differences between Mobile OS and Computer OS. 4
- (b) List any five (5) naming rules of a variable in computer programming language. 5
- (c) Write flowchart to determine whether a given number is positive or negative. 4
- (d) An ATM is where we can access our bank account using ATM card and PIN. On successful login, we can check account balance, withdraw cash, print statement. Write an algorithm to simulate above ATM operations. 7

OR

10. (a) Compare Multiprocessing with multiprogramming with example each. 4
- (b) List and draw any five (5) symbols used in flowchart. 5
- (c) Write algorithm to find whether a given number is odd or even. 4
- (d) A traffic signal changes its colors in cycle as follows : 7

Green → Yellow → Red → Yellow → Green → ...

In each cycle :

- (i) Green signal stays for thirty (30) seconds.
- (ii) Yellow signal stays for five (5) seconds twice in a cycle.
- (iii) Red signal stays for thirty (30) seconds.

Write flow chart to simulate above traffic signal.

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**Makeup Examination Nov/Dec - 2022**  
**I Semester Diploma Examination**  
**FUNDAMENTALS OF COMPUTER (20CS11T)**

**Time: 3 Hours ]**

**[ Max. Marks: 100**

- Instruction:** i) Answer ONE full question from each section.  
ii) One full question carries 20 marks.

**SECTION - I**

1. (a) Explain different types of number systems. (10)  
(b) Convert the following (6)  
(i)  $(111000)_2$  to  $( \quad )_{10}$   
(ii)  $(425)_{10}$  to  $( \quad )_2$   
(iii)  $(147)_8$  to  $( \quad )_2$   
(c) Write a note on ASCII code. (4)
2. (a) List and Explain basic gates with logic symbol, expressions and truth table. (10)  
(b) Develop truth table for 3 inputs OR gate. (10)

**SECTION-II**

3. (a). State and prove Demorgan's 1 theorem (04)  
(b). Differentiate multiplexer and demultiplexer. (06)  
(c). Explain 4:1 multiplexer. (10)
4. (a). Implement decimal to BCD encoder (10)  
(b). Design full adder circuit with truth table. (10)

**SECTION - III**

5. a. Explain the working of a Laser Printer with a neat diagram. (10M)  
b. Classify Computers according to purpose. (5M)  
c. List various input and output devices. (5M)



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6. a. Define Computer network. List and explain its categories? (10M)  
b. What are the various methods of data processing? (5M)  
c. Classify Counters. List any 2 applications of Counters. (5M)

**SECTION – IV**

7. a. Explain the functional units of computer with neat diagram (8)  
b. What are the various data processing methods. (6)  
c. Explain any 2 cyber security threats. (6)

**OR**

8. a. Differentiate between BIOS and UEFI. (6)  
b. List the different OS available in market and which OS is used in desktop, laptops and mobiles, (5)  
c. Show or explain hierarchical arrangement of computer memory in terms of speed, size and cost. (6)  
d. List different network topologies. (3)

**SECTION – V**

9. a. Explain the following (10)  
i. Stored program concept. ii. BIOS  
b. Define variable. Mention the rules for naming variables. (5)  
c. Draw a flowchart to find sum and average of 3 numbers. (5)

**OR**

10. a. Explain the different generations of Programming languages. (10)  
b. A user enters the input, write an algorithm to check whether entered input is a character or a number. (10)