

Register
Number

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I Semester Diploma Examination, Oct./Nov.-2021

FUNDAMENTALS OF COMPUTER

Time : 3 Hours]

[Max. Marks : 100

Special Note : Students can answer for max. of 100 marks, selecting any subsection from any main section.

SECTION - 1

1. (a) Define number system. Explain the characteristics of number system. 10
(b) Convert the following : 10
(i) Binary to Decimal : 11101_2
(ii) Decimal to Binary : 456_{10}
(iii) Binary to Octal : 10001_2
(iv) Decimal to Octal : 567_{10}
(v) Hexadecimal to Decimal : $7AC_{16}$
2. (a) Explain the following terms : 10
(i) BCD
(ii) EBCDIC
(iii) ASCII
(iv) UNICODE
(v) GRAY CODE
(b) Draw a circuit to realize the expressions using AND gates, OR gates and Invertors and write truth table $Y = \overline{(\overline{A} \cdot B)} + (A \cdot \overline{B})$. 10

SECTION - 2

3. (a) State the laws and rules of Boolean Algebra. 10
(b) Describe half adder with logic diagram and truth table. 10



4. (a) Describe a 4 – to – 1 multiplexer. 6
 (b) List different types of flip-flops. 4
 (c) Explain D-flip flop with truth table and logic symbol and logic circuit. 10

SECTION – 3

5. (a) Discuss the applications of counters. 5
 (b) What is decoder ? Identify its applications. 5
 (c) Construct a 4 bit SIPO (Serial In Parallel Out) Shift register with logic circuit. 10
6. (a) (i) Discuss the characteristics of computers. 10
 (ii) List various applications of computers.
 (b) List and explain different categories of computer networks. 10

SECTION – 4

7. (a) Explain the following : 10
 (i) Single user programming
 (ii) Multi programming
 (b) List and explain Flynn's classification of computers. 5
 (c) Briefly explain BIOS. 5
8. (a) Explain memory hierarchy with a diagram. 4 + 6
 (b) Describe the functions of
 (i) Real time operating system 5
 (ii) Mobile operating system 5

SECTION – 5

9. (a) Draw the block diagram of a computer and examine the working of functional units. 10
 (b) Draw a flow chart to accept the age of a person and check whether he/she is a child, teenager or an adult. A person is a child if the age is less than or equal to 14. A person is a teenager if the age is between 15 and 17. A person is an adult if the age is greater than or equal to 18. 10
10. (a) Define flowchart. Explain different symbols used in flowchart. 10
 (b) Write an algorithm for finding largest of 3 numbers. 10



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Code : 20CS11T

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I Semester Diploma Examination, April/May-2021
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

1. (a) Convert the following : 6
(i) Binary number 11011 to decimal number.
(ii) Decimal number 497 to Octal number.
(b) Express the decimal number (-49) in 8 bit binary form of 6
(i) Sign - Magnitude form
(ii) 1's complement form
(iii) 2's complement form
(c) Write binary equivalent ASCII code for the words 8
(i) CART
(ii) blue.

ASCII code of 'A' is 65 in decimal, 'a' is 97 in decimal.

2. (a) Explain universal gates with logic symbol, expressions, truth table. 8
(b) Develop a truth table for 3 input AND gate. 8
(c) Determine when the output of XOR and XNOR logic gates are high 4

SECTION - II

3. (a) Apply Boolean algebra rules / laws and prove, 10
(i) $(A + B)(A + C) = A + BC$
(ii) $AB + A(B + C) + B(B + C) = B + AC$.
(b) Design a full adder circuit with truth table. 6
(c) Implement a comparator using Logic gates. 4
4. (a) Define and explain 4 : 1 multiplexer. 10
(b) Explain the construction of 4 bit synchronous counter with Truth table. 10

SECTION - III

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| 5. | (a) | List different types of flip flops. | 4 |
| | (b) | Describe J K Flip Flop working with a diagram. | 6 |
| | (c) | Construct 4-bit SISO shift register & explain its working. | 8 |
| | (d) | List the applications of counter. | 2 |
| 6. | (a) | Classify computers based on purpose and size. | 6 |
| | (b) | Distinguish between system software & application software. | 4 |
| | (c) | Describe the working of Keyboard. | 10 |

SECTION - IV

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| 7. | (a) | Explain Computer network categories. | 5 |
| | (b) | Describe online data processing method. | 5 |
| | (c) | Explain the functional units of computer with diagram. | 10 |
| 8. | (a) | Discuss Auxiliary memory. | 5 |
| | (b) | Explain Cache memory. | 5 |
| | (c) | Classify Computers based on Flyns classification. | 5 |
| | (d) | Explain BIOS. | 5 |

SECTION - V

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| 9. | (a) | Differentiate the following : | 10 |
| | (i) | Multitasking Operating System and Multiprocessing operating system. | |
| | (ii) | Real time operating system and Batch processing operating system. | |
| | (b) | Write an algorithm to find area of circle.
Using area = $\pi \cdot r^2$ | 5 |
| | (c) | Draw flowchart to accept the length of two different line segments and check whether they are equal or unequal. Display the message accordingly. | 5 |
| 10. | (a) | Explain generation of programming language. Give example for each. | 10 |
| | (b) | Define variable. Specify the rules for naming a variable. Give examples. | 10 |