

2023
B.A./B.Sc.
First Semester
 CORE – 2
COMPUTER SCIENCE
Course Code: CSC 1.21
 (Computer System Architecture)

Total Mark: 70
Time: 3 hours

Pass Mark: 28

Answer five questions, taking one from each unit.

UNIT-I

1. (a) Explain sequential circuit and combinational circuit. 4
 (b) Draw the truth table and logic circuit for $A.B'+(C'.D)'$. 4
 (c) Simplify $F(a, b, c, d) = \prod (0, 2, 4, 5, 6, 7, 8, 10, 12, 13, 15)$ using K-map. 6
2. (a) What is a flip-flop? List and explain any three types of flip-flops. 1+3=4
 (b) Draw the circuit diagram for $(M+N)'.P.Q'$ using NAND and NOR gate. 4
 (c) Simplify $F(w, x, y, z) = \sum (0, 1, 2, 3, 4, 5, 6, 8, 9, 10, 11, 12, 14)$ using K-map. 6

UNIT-II

3. (a) Subtract 110111_2 from 1111101_2 using 1's complement. 2
 (b) Explain octal and hexadecimal number systems. 6
 (c) Convert $DC.4A_{16}$ to its equivalent binary, decimal, and octal number. 6
4. (a) Add 111101_2 , 1011_2 and 111110_2 . 2
 (b) Explain decimal and binary number systems. 6
 (c) Convert 121.57_8 to its equivalent binary, decimal, and hexadecimal number. 6

UNIT-III

5. (a) Explain the interconnection structure of a computer system. 7
(b) What is a computer instruction? Write a note on memory reference instruction set and register reference instruction. 1+6=7
6. (a) What is a register? List and explain the various types of registers. 1+6=7
(b) What is an instruction set? List and explain the life cycle of an instruction. 1+6=7

UNIT-IV

7. (a) Write a note on microprogrammed controls. 6
(b) Convert the infix expression $u * v / w + x - y$ to postfix expression. 8
8. (a) What is a software interrupt? 2
(b) What is RISC? List the characteristics of RISC. 1+3=4
(c) Convert the infix expression $a + b * c - d / e$ to prefix expression. 8

UNIT-V

9. (a) Explain programmed I/O and interrupt driven I/O. 8
(b) Explain any three input devices in detail. 6
10. (a) Write notes on DMA. 7
(b) Explain main memory and auxiliary memory in detail. 7