

**VIT**

Vellore Institute of Technology

Slot : A2+TA2

School of Computer Science Engineering and Information Systems**Winter Semester 2023-2024****Continuous Assessment Test – I****Programme Name & Branch: M. Tech Software Engineering****Course Name & code : Digital Logic and Microprocessor ISWE 201L****Class Number (s) : VL2023240503090, VL2023240503083, VL2023240503076, VL2023240503095, VL202324503111****Faculty Name (s) : Dr. Suganya P, Dr. Sumathi D, Dr. Santhi K, Dr. Pradeepa M, Dr. Krishnamoorthy N****Exam Duration : 90 Min.****Maximum Marks: 50****Answer all the Questions:****1) Convert****(4x2.5=10)**i) $75A2.F43_{16} \rightarrow ?_8$ 72642.7503 ii) $34D.7C_{16} \rightarrow ?_{10}$ 845.4334 iii) $34C.A27_{16} \rightarrow ?_2$ $001101001100.101000100111$ iv) Gray code 100110 $\rightarrow$ Binary Code? 111011 2) Simplify $F = \pi M(0, 1, 2, 3, 4, 6, 12)$ using Quine Mc-Cluskey Method. $(A+B)(A+B)(B+C)$

3) Design a circuit that can shift three-bit vector $W=w_2w_1w_0$ one bit position to the right with the control input S . The outputs of the circuit be a three-bit vector $Y=y_2y_1y_0$ and a signal k . If the control input S is equal to 1, then $y_2=w_0$, $y_1=w_2$, $y_0=w_1$ and $k=w_0$. If S is equal to 0, then $y_2=w_0$, $y_1=w_2$, $y_0=w_1$ and $k=0$.

$w_0 + w_2 + w_1 + S w_0$

4) a) Identify what type of gate is represented by each of the following phrases: (4 Marks)

- Any low input guarantees a high output.
- Any high input guarantees a low output.
- Any high input guarantees a high output.
- Any difference in the inputs guarantees a high output.
- Any difference in the inputs guarantees a low output.

b) A burglar alarm is designed so that it senses four input signal lines. Line A is from the secret control switch, line B is from a pressure sensor under a steel safe in a locked closet, line C is from a battery-power clock, and line D is connected to a switch on the locked closet door. The following conditions produce logic 1 voltage on each line.

- A : The control switch is closed.
- B : The safe is in its normal position in the closet.
- C : The clock is between 10:00 and 14:00 hours.
- D : The closet door is closed.

Write the expression and implement the logic circuit using only minimal NAND Gate for the burglar alarm that produces a logic-1 (rings a bell) when the safe is moved and the control switch is closed, or when the closet is opened after banking hours, or when the closet is opened with the control switch open.

(6 Marks)

5) Design a 4 bit binary to gray code converter using decoder.