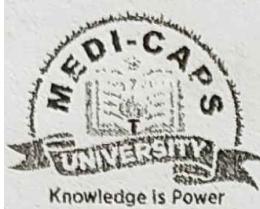


Total No. of Questions: 4



Enrollment No. EN21CS303029

Faculty of Engineering

Mid Sem I Examination September -2022

EC3CO07/CS3ES29/IT3CO09 - Digital Electronics

Programme: B.Tech.

Branch/Specialisation: EC/CS/IT

Duration: 2 Hrs.

Maximum Marks: 40

- Q.1 i. The logical expression $Y = A + A'B$ is equivalent to ----- 1
a) $Y = AB$ b) $Y = A'B$ c) $Y = A + B'$ d) $Y = A + B$
- ii. Which of the following is a parallel to serial converter 1
a) Decoder b) Digital Counter c) Demultiplexer d) Multiplexer
- iii. A K-map of four variables contains ---- cells. a) 4 b) 8 c) 2 d) none of these 1
- iv. The binary equivalent of the decimal number 57 is ----- 1
a) 111001 b) 110101 c) 101111 d) none of these
- v. For a four bit binary to gray code converter, if the binary input is 1011, the gray code output will be----- 1
a) 1110 b) 0100 c) 1101 d) none of these
- vi. In combinational circuit, the output at any time depends on ----- 1
a) Past & present input b) Present input c) past output & present input
d) past input & present output.
- vii. 2's complement of binary number 1100110 is ----- 1
a) 011010 b) 0011001 c) 1101001 d) none of these
- viii. The following gate is an universal gate 1
a) AND b) OR c) EX-OR d) NAND
- ix. In 8-4-2-1 BCD code, the decimal number 25 is written as ----- 1
a) 11001 b) 31 c) 00100101 d) none of these
- x. The hexadecimal equivalent of the octal number 360 is ----- 1
a) E0 b) F0 c) 7A d) none of these

- Q.2 i. Perform the following arithmetic operation on the given decimal numbers using 2's complement method. 4
a) $46 + (-23)$ b) $(-25) + (-15)$
- ii. Implement the Boolean Expression for EX-OR gate using NAND 6

- | | | |
|-----|-------------|---|
| | gates only. | |
| OR | iii | Explain the operation of half adder & full adder using truth table & logic circuit. 6 |
| Q.3 | i. | Express the following logical expression in standard (canonical) SOP form. 2 |
| | | $Y(A,B,C) = AB + B'C$ |
| | ii. | Simplify the given logical expression using K-map & realise it using basic gates. The expression is $Y(A,B,C,D) = ABC' + BCD + BCD'$ 8 |
| OR | iii. | Simplify the logical expression 8 |
| | | $Y = \sum m(0, 2, 3, 6, 7, 8, 10, 12, 13)$ using Quine-McCluskey method. |
| Q.4 | | Attempt any two |
| | i. | Realize the following expression using 8:1 Multiplexer 5 |
| | | $Y(A,B,C) = \sum m(0, 1, 2, 6, 7)$ |
| | ii. | Using Boolean algebra show that 5 |
| | | $BC + AC' + AB + BCD = BC + AC'$ |
| | iii. | Write the truth table for the logical expression $Y = AB + AC'$ & realize it using NOR gates only. 5 |

六六六六六六

30