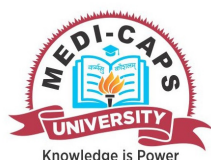


Total No. of Questions: 6

Total No. of Printed Pages: 2



Faculty of Science / Engineering
End Sem Examination Dec-2023

CA3CO18 Digital Electronics

Programme: BCA / BCA- Branch/Specialisation: Computer
MCA (Integrated) Application

Duration: 3 Hrs.

Maximum Marks: 60

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d. Assume suitable data if necessary. Notations and symbols have their usual meaning.

- Q.1 i. Convert the hexadecimal number $(1E2)_{16}$ to decimal- **1**
(a) 480 (b) 483 (c) 482 (d) 484
- ii. 2's complement of 11001011 is _____. **1**
(a) 01010111 (b) 11010100
(c) 00110101 (d) 11100010
- iii. Minimum number of NOR gate required to implement Ex-OR gate is- **1**
(a) 2 (b) 5 (c) 3 (d) 4
- iv. If $A=1$ and $B=0$, then in terms of Boolean algebra, $A+\bar{B} =$ _____. **1**
(a) A (b) \bar{A} (c) B (d) None of these
- v. For a design of (16:1) multiplexer, how many select lines will be required? **1**
(a) 1 (b) 3 (c) 4 (d) 2
- vi. How is a J-K flip flop made to toggle? **1**
(a) $J=0, K=0$ (b) $J=1, K=1$
(c) $J=0, K=1$ (d) $J=1, K=0$
- vii. Which of the following is a function of a shift register? **1**
(a) To convert digital information into analog signals
(b) To store bits and bytes of binary data temporarily
(c) To convert serial digital information into parallel or parallel digital information into serial
(d) To control voltage levels according to clock pulses
- viii. A register capable of incrementing and/or decrementing its contents- **1**
(a) Counter (b) Decoder
(c) Multiplexer (d) Demultiplexer

[2]

- ix. Which memory cannot be accessed directly by the CPU of the computer? **1**
(a) RAM (b) Cache memory (c) ROM (d) Memory card
- x. Which of the following is a permanent memory in the computer? **1**
(a) RAM (b) ROM (c) CPU (d) CD ROM
- Q.2 i. Convert the following: **2**
(a) $(1E.53)_{16}$ to octal number (b) 0100110 to Gray Code
- ii. Explain BCD code and Excess3 code with example. **3**
- iii. Define half adder and full adder with suitable diagram. **5**
- OR iv. Draw and explain half subtractor and full subtractor. **5**
- Q.3 i. Write any four laws of Boolean algebra. **2**
- ii. What is logic gates? Draw and explain the different types of logic gates with the help of Boolean expression and truth table. **8**
- OR iii. Design AND gate using NAND gate. Simplify Boolean function $f(P,Q,R,S)$ for $\sum m(0,2,5,7,9,11)+d(3,8,10,12,14)$ using K-Map. **8**
- Q.4 i. Implement the following function using MUX- **3**
 $f(A,B,C) = \sum m(1,2,5,7)$
- ii. Draw and explain clocked SR flip flop using NAND gate (Level Triggered). **7**
- OR iii. Explain the working of Master Slave JK flip flop. Also draw its truth table. **7**
- Q.5 i. Draw and explain the working operation of ring counter. **4**
- ii. Explain the construction and working of serial in serial out shift register. **6**
- OR iii. Give performance comparison of counters and registers. **6**
- Q.6 Attempt any two: **5**
- i. What is ROM? Explain the types of ROM. **5**
- ii. Give the performance comparison of RAM and ROM. **5**
- iii. Explain the following: **5**
(a) Cache and flash memory (b) Physical and virtual memory
