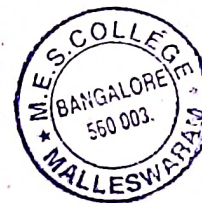


**OEEL112**

Reg. No.

--	--	--	--	--	--	--	--

**I Semester B.Sc. Degree Examination, April - 2023****ELECTRONICS****Digital Fundamentals (Open Elective)****(NEP 2020 Scheme)****Paper : ELE - OE - 1.5****Time : 2½ Hours****Maximum Marks : 60****Instructions to Candidates:**

*Answer all the questions from Part – A, any TEN questions from Part – B and any FOUR questions from Part – C.*

**Note :** *Answer all questions of Part – A in any one page, the same questions answered multiple times will not be considered for Evaluation.*

**PART - A****1. Answer all the subdivisions.****(20×1=20)**

- i) The base of decimal number system is
  - a) 2
  - b) 8
  - c) 10
  - d) 16
- ii) A Byte consists of \_\_\_\_ bits
  - a) 8
  - b) 4
  - c) 12
  - d) 16
- iii) Any signed negative binary number is recognized by its \_\_\_\_
  - a) MSB
  - b) LSB.
  - c) Byte
  - d) Nibble
- iv) Next element in the hexadecimal series 18H, 19H is
  - a) 1BH
  - b) 20H
  - c) 1AH
  - d) 10H
- v) The binary equivalent of 658 is
  - a) 110101(2)
  - b) 111101(2)
  - c) 101101(2)
  - d) 100101(2)
- vi) The hexadecimal equivalent of the binary number 100100011010(2) is
  - a) 91AH
  - b) 9A1H
  - c) A91H
  - d) 19AH

**[P.T.O.]**



- vii) 2's complement of  $11001011_{(2)}$  is \_\_\_\_\_
- a) 01010111                      b) 11010100  
c) 00110101                      d) 11100010
- viii) Binary coded decimal or BCD is also known as \_\_\_\_\_ code.
- a) 2841                              b) 4821  
c) 5321                              d) 8421
- ix) ASCII code is \_\_\_\_\_ bit code
- a) 7                                      b) 8  
c) 32                                    d) 64
- x) Parity bit is used
- a) for error detection              b) as a sign bit  
c) for storing                        d) as a data bit
- xi) AND gate produces high output when
- a) any one of the input is low      b) any one of the input is high  
c) all the inputs are high            d) all the inputs are low.
- xii) How many two input AND gates and two input OR gates are required to realize  $Y = BD + CE$ ?
- a) 3, 2                                  b) 4, 2  
c) 2, 1                                  d) 2, 3
- xiii) NOR gate is derived as a combination of
- a) NOT and XOR gate                b) NOT and OR gate  
c) NOT and XNOR gate               d) NOT and AND gate
- xiv)  $A+AC=$
- a) C                                      b) A  
c) 1                                        d) 0
- xv) \_\_\_\_\_ circuits are contained in a 7400 IC.
- a) NOR gates                          b) NAND gates  
c) OR gates                            d) AND gates
- xvi) The minterm designator for the term  $A\bar{B}CD$  is
- a)  $m_4$                                     b)  $m_{11}$   
c)  $m_5$                                     d) none of these
- xvii) In a k map simplifications quad eliminates \_\_\_\_\_ variables
- a) 1                                        b) 2  
c) 3                                        d) 4



(3)

OEEL112

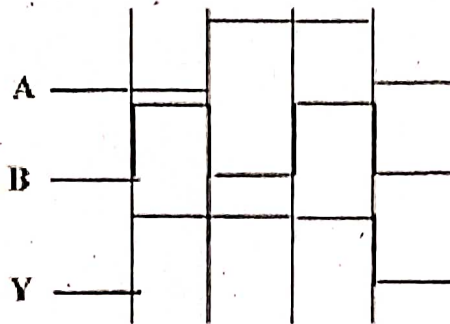
xviii) A k map of 3 variables has \_\_\_\_\_ cells.

- a) 6
- b) 4
- c) 8
- d) 16

xix) Truth table of a logic gate gives the relation between

- a) all possible inputs and all outputs
- b) few inputs and few outputs
- c) all possible inputs and few outputs
- d) few inputs and all outputs

xx) The timing diagram shown in the figure is for \_\_\_\_\_ gate.



- a) AND
- b) XOR
- c) OR
- d) NOR

### PART - B

Answer any TEN questions.

(10×2=20)

1. Convert 99(10) in to binary.
2. Convert ABC(16) to Octal.
3. Add 986H with ABCH.
4. Subtract 1001002 from 1101012 using 2's complement subtraction.
5. Multiply 11012 with 102
6. Draw the logic circuit for the expression  $Y = A + CD$ .
7. Write the 2's complement of 2BCH.
8. Explain the self complementing property of excess-3 code.
9. Write the Boolean expressions relating to associative law and commutative law.

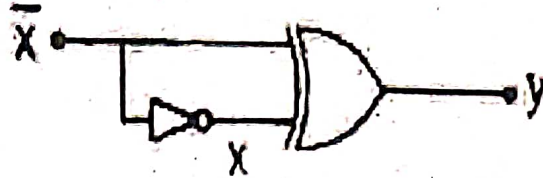
[P.T.O.]



(4)

OEEL112

10. Write the expression for the given circuit and simplify it.



- 11. Draw the pin diagram of IC 7404.
- 12. Draw the timing diagram of two input NAND gate.
- 13. Convert the  $f(ABC) = A + BC$  to standard SOP format.
- 14. What do you mean by redundant group in k map?
- 15. Explain pair in K map with an example.

#### PART - C

Answer any FOUR questions.

(4×5=20)

- 16. Subtract 64H from ABH using 2's complement method and express the result in decimal.
- 17. List the steps involved in inter-conversion of binary and gray code with a numerical example.
- 18. State and verify De Morgan's theorems.
- 19. Show the universal property of NOR gate by realizing AND, OR and NOT gates.
- 20. Simplify  $F(A, B, C) = \sum m(1, 2, 5, 7) + \sum d(0, 4, 6)$  using k map.
- 21. Simplify the relation for the output Q in the following logic circuit and draw the simplified circuit.

