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B—376—2019

FACULTY OF SCIENCE

B.Sc. (First Semester) EXAMINATION

MARCH/APRIL, 2019

(CBCS Pattern)

ELECTRONICS

Paper - II

(Fundamentals of Digital Electronics)

(MCQ+Theory)

(Tuesday, 16-4-2019)

Time : 10.00 a.m. to 12.00 noon

Time—2 Hours

Maximum Marks—40

N.B. :- (i) All questions are compulsory.

(ii) Negative system of marking is for the MCQs part.

(iii) Use of logarithmic table and calculator is not allowed.

(MCQ)

1. Attempt all questions :

10

(i) Which of the following decimal no. is obtained by taking 2's compliment of binary no. 1100 ?

(A) 12 (B) 0100

(C) 4 (D) 3

(ii) $(100)_2 + (100)_2 + (100)_2 + (100)_2 = (?)_{16}$

(A) 400 (B) 1000

(C) 100 (D) 10

(iii) Decimal value of binary no. 11111111 = ?

(A) $2^7 - 1$ (B) $2^8 - 1$

(C) $2^5 - 1$ (D) $2^2 - 1$

P.T.O.

WT

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- (iv) Number of NOR gate required to implement NAND gate is
- (A) 3 (B) 2
(C) 5 (D) 4
- (v) Which of the following gate is used as a two bit comparator ?
- (A) Ex-OR (B) OR
(C) AND (D) Ex-NOR
- (vi) Output of logic gate is '1' when all of its inputs are at logic '0', then the gate is
- (A) NAND (B) NOR
(C) EX-NOR (D) All of these
- (vii) Which of the following statements is not true ?
- (A) $A + A = A$ (B) $A + \bar{A} = 1$
(C) $\overline{A + A} = 0$ (D) $A \cdot \bar{A} = A$
- (viii) In Boolean algebra $A + A$ is always
- (A) 2A (B) 1
(C) A (D) 0
- (ix) In Karnaugh letter 'X' represents
- (A) Multiplication (B) Don't care
(C) 10 (D) Empty cell
- (x) Which of the following represents maxterm 7 in four variable expression ?
- (A) $A + \bar{B} + \bar{C} + \bar{D}$ (B) $\bar{A} + B + C + D$
(C) $A\bar{B}\bar{C}\bar{D}$ (D) $\bar{A}BCD$

WT

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(Theory)

2. Attempt any five :

10

- (a) $(127.1)_8 = (?)_{10}$
- (b) Determine hexadecimal equivalent of binary no. (11011.01)
- (c) Construct NOT gate using NAND and NOR gate.
- (d) Draw the truth table for EX-NOR gate.
- (e) State distributive laws.
- (f) Write down all minterms for three variable A, B and C.
- (g) Draw K-map for $Y(A, B, C) = \sum m(2, 3, 4)$.

3. Attempt any four :

10

- (a) Perform the following operations :
- (i) $(11110)_2 + (101)_2$
- (ii) $(1010)_2 - (10)_2$
- (b) Define EX-OR gate. Draw its symbol, truth table and write its logic expression. How is it used as a NOT gate ?
- (c) Prove that :

$$\overline{AC} + \overline{ABC} = 0.$$

- (d) Obtain the simplest possible SOP expression using K-map for :

$$F(ABCD) = \sum m(1, 3, 7, 11, 15) + \sum d(0, 2, 5).$$

4. Attempt the following :

10

- (a) Convert the following :

(i) $(50.58)_{10} = (?)_{BCD}$

(ii) $(37.34)_{10} = (?)_{XS-3}$

P.T.O.

WT

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- (b) Define OR gate. Draw its symbol, truth-table and write its logic expression.

Or

- (x) Convert the following :
- (i) $(10011011)_2 = (?)_{\text{Gray}}$
- (ii) $(4532)_{10} = (?)_{16}$
- (y) Define 2-input NAND gate. Draw its symbol, truth table and write its logic expression.