

TDC Odd Semester Exam., 2020
held in July, 2021

UNIT—II

COMPUTER SCIENCE

(Honours)

(1st Semester)

Course No. : BCSH-102

(Digital Electronics and Fundamentals
of Computers)

Full Marks : 35

Pass Marks : 12

Time : 2 hours

The figures in the margin indicate full marks
for the questions

Answer **five** questions, selecting **one** from each Unit

UNIT—I

1. Explain how transistor acts as a switch. 7
2. Write short notes on the following : $3\frac{1}{2}+3\frac{1}{2}=7$
 - (a) Forward-biased diode
 - (b) Reverse-biased diode

3. (a) Express the following function in the sum of minterms and product of maxterms : 5

$$F(A, B, C, D) = D(A \oplus B) \oplus BD$$

- (b) Convert the following to the other canonical form : 2

$$F(x, y, z) = (0, 3, 6, 7)$$

4. (a) Simplify the following Boolean function and implement it with NAND gates : 3

$$F = AC + ACE + ACE + ACD + ADE$$

- (b) Implement the following function using don't care conditions :

$$F = ABC + ABD + ABCD$$

$$d = ABC + ABD$$

Assume that both the normal and complement inputs are available with no more than two NOR gates. 4

UNIT—III

5. Design a BCD-to-7 segment decoder. 7
6. Design a BCD adder. 7

(3)

UNIT—IV

7. (a) What is sequential circuit? How does it differ from combinational circuit? 1+2=3
(b) Explain JK flip-flop?. 4
8. (a) Explain D flip-flop and T flip-flop. 4
(b) Discuss the procedure of designing a counter with binary sequence. 3

UNIT—V

9. Explain the working principle of binary ripple counter. 7
10. Write short notes on the following : 2+3+2=7
(a) RAM
(b) Synchronous counters
(c) Memory unit

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