PAPER ID-421345

Subject Code: KOE049

Roll No: | | | | | | | | | | | | | |

BTECH
(SEM IV) THEORY EXAMINATION 2021-22
DIGITAL ELECTRONICS

Time: 3 Hours ***Total Marks: 100***

Note: Attempt all Sections. If you require any missing data, then choose suitably.

SECTION A

1. Attempt *all* questions in brief. **2x10 = 20**

Qno	Questions	CO
(a)	Define the term binary codes with an example.	1
(b)	Differentiate between SOP & POS form.	1
(c)	Define the term combinational logic with an example.	2
(d)	Discuss universal gates.	2
(e)	Explain the term Latch.	3
(f)	Explain the term registers.	3
(g)	Define Asynchronous circuits.	4
(h)	Discuss hazards.	4
(i)	Discuss logic family and its use.	5
(j)	What do you mean by a memory?	5

SECTION B

2. Attempt any *three* of the following: **10x3 = 30**

Qno	Questions	CO
(a)	Explain the implementation of an X-OR gate with NAND implementation.	1
(b)	Illustrate the working of Serial and parallel adders and differentiate the operations.	2
(c)	Explain the working of J-K Flip-Flop.	3
(d)	Define the state reduction steps for a machine.	4
(e)	Discuss different types of RAM memory cell.	5

SECTION C

3. Attempt any *one* part of the following: **10x1 = 10**

Qno	Questions	CO
(a)	Minimize the following Boolean function using K Map $f(A,B,C,D) = \sum m(0,1,4,8,9,10) + \sum d(2,11)$	1
(b)	Explain different steps associated to Quine Mc Culsy (Tabular Method) of minimizing Boolean Functions.	1

4. Attempt any *one* part of the following: **10x1 = 10**

Qno	Questions	CO
(a)	Design a 4-bit magnitude comparator.	2
(b)	Design a full adder and full subtractor using NAND gates only.	2

5. Attempt any *one* part of the following: **10x1 = 10**

Qno	Questions	CO
(a)	Describe the Design of J-K FF using T FF.	3
(b)	Describe the operations and applications of a Serial-in Parallel-out Shift Register with a neat diagram.	3

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6. Attempt any *one* part of the following: 10x1 = 10

Qno	Questions	CO
(a)	Design a sequential circuit with two flip flops A & B and one input x. when x = 0, the state of the circuit remains the same and when x = 1 the circuit passes through the state transitions from 00 to 01 to 11 to 10 back to 00 and repeat.	4
(b)	A sequential circuit has two J K flip flops A & B, two inputs X & Y, and one output Z. The equations defining this system are as following: $J_A = BX + B'Y'$ $K_A = B'XY'$ $J_B = A'X$ $K_B = A + XY'$ $Z = AXY + BX'Y'$ Design the circuit.	4

7. Attempt any *one* part of the following: 10x1 = 10

Qno	Questions	CO
(a)	Explain the working and structure of EEPROM cell.	5
(b)	Describe the difference between PAL & PLA using neat diagram and suitable examples.	5