Q. Code:761720

Reg. No. | | | | | | | | | | | | | |

B.E. / B.TECH. DEGREE EXAMINATIONS, MAY 2024

Second Semester

CS18201 – DIGITAL PRINCIPLES AND SYSTEM DESIGN

(Computer Science and Engineering)

(Regulation 2018/2018A)

TIME: 3 HOURS **MAX. MARKS: 100**

COURSE OUTCOMES	STATEMENT	RBT LEVEL
CO 1	Students will be able to learn the different types of number systems and simplification of Boolean functions	**3**
CO 2	Students will be able to understand various logic gates and their usage.	**3**
CO 3	Students will be able to study, analyse and design various combinational circuits and its implementation using VHDL	**4**
CO 4	Students will be able to study, analyse and design various synchronous and asynchronous sequential circuits and its implementation using VHDL.	**4**
CO 5	Students will be able to understand the different type of memory and their structures	**3**

PART- A (10 x 2 = 20 Marks)

(Answer all Questions)

		CO	RBT LEVEL
1.	Find the Octal equivalent of the hexadecimal number DC.BA	**1**	**3**
2.	Simplify the Boolean function F = x'y' + xy + x'y	**1**	**3**
3.	Differentiate between Combinational and Sequential Circuits.	**2**	**3**
4.	Define propagation delay ?	**2**	**2**
5.	Construct the Excitation Table of JK- Flip Flop.	**3**	**3**

6.	Discuss briefly about edge triggered flip flops ?	**3**	**3**	
7.	Enumerate the different techniques used in State assignment ?	**4**	**3**	
8.	Discuss race free condition in sequential circuits?	**4**	**3**	
9.	Define Error detecting codes ? Give examples.	**5**	**2**	
10.	List the major differences between PLA and PAL.	**5**	**2**	

PART- B (5 x 14 = 70 Marks)

			Marks	CO	RBT LEVEL
11. (a)	**(i)**	Solve the following expression using Karnaugh Map Y = A'BCD' + A'BC'D + ABC'D' + A'B'CD'.	**6**	**1**	**3**
	(ii)	Simplify the following expression and implement them with two-level NAND gate circuits: BD + BCD' + AB'C'D'	**8**	**1**	**3**
		(OR)			
	(b)	Minimize the following expression using the Quine McCluskey method. Y = A'BC'D' + A'BC'D + ABC'D' + ABC'D + AB'C'D + A'B'CD'	**14**	**1**	**3**
12. (a)		Construct a combinational circuit that converts 8421 BCD code to excess-3 code.	**14**	**2**	**3**
		(OR)			
	(b)	Construct a Full Subtractor and derive expression for difference and borrow. Realize the circuit using gates.	**14**	**2**	**3**

			Marks	CO	RBT LEVEL
13. (a)		Illustrate the working of Master Slave JK FlipFlop with their Characteristic and Excitation Table.	**14**	**3**	**4**
		(OR)			
(b)		With necessary example and diagram illustrate the concept of reduction of states and flow tables.	**14**	**3**	**4**
14. (a)	**(i)**	Give the comparison between the Synchronous and Asynchronous Sequential circuits	**5**	**4**	**4**
	(ii)	Outline the procedure for analyzing Asynchronous sequential circuits.	**9**	**4**	**4**
		(OR)			
(b)	**(i)**	Examine the possible Hazards and methods to avoid them in the combinational circuits.	**6**	**4**	**4**
	(ii)	Examine the possible Hazards in sequential circuits.	**8**	**4**	**4**
15. (a)		Illustrate the Error detection and Correction using Hamming Codes.	**14**	**5**	**3**
		(OR)			
(b)		With a neat diagram construct the working principle of Programmable Array Logic.	**14**	**5**	**3**

PART- C (1 x 10 = 10 Marks)

(Q.No.16 is compulsory)

			Marks	CO	RBT LEVEL
16.		Implement the switching function	**10**	**2**	**5**
		$F(A,B,C,D) = \Sigma m(1,3,4,11,12,13,14,15)$ using an 8:1 multiplexer.			

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