K. J. Somaiya Institute of Technology, Sion, Mumbai-22
(Autonomous College Affiliated to University of Mumbai)

Nov – Dec 2023 (B.Tech) Program: Electronics and Telecommunication Scheme –II B Examination: SY Semester: -III Course Code: EXC302 and Course Name: Digital Logic Design	
Date of Exam: 01-12-2023 Duration: 2.5 Hours Max. Marks: 60	

Instructions:
(1) All questions are compulsory.
(2) Draw neat diagrams wherever applicable.
(3) Assume suitable data, if necessary.

		Max. Marks	CO	BT level
Q 1	Solve any six questions out of eight:	12		
i)	Find the 2's complement of number -175.		CO1	A
ii)	Define FAN-IN and FAN-OUT for logic gates.		CO1	U
iii)	Using truth table of 4:1 multiplexer, find the Boolean expressions for output variables Y, if D1 and D2 inputs are selected.		CO2	U
iv)	Compare combinational and sequential circuits.		CO4	U
v)	Explain Static RAM.		CO3	U
vi)	What is VHDL? List the logical operator supported by VHDL.		CO6	U
vii)	Write an excitation table for T FlipFlop.		CO4	U
viii)	What will be the output of the magnitude comparator if it compares two binary numbers A=0100 and B=1010?		CO2	A
Q.2	Solve any four questions out of six.	16		
i)	Convert binary number $(10111001)_2$ into decimal number and Octal number $(22.34)_8$ into hexadecimal number.		CO1	A
ii)	Explain De Morgan's theorem with examples.		CO1	U
iii)	Design full adder for three input bits and produces output as sum and carry.		CO2	A
iv)	Explain J-K flip flop digital circuit in detail.		CO4	U

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v)	Compare Static RAM and dynamic RAM.		CO3	U
vi)	Write VHDL code for full adder.		CO6	A
Q.3	Solve any two questions out of three.	16		
i)	Perform the following operation. a) Add -45 to +12 using 8 bit 2's complement. b) Subtract 14 from 46 using 8 bit 2's comp arithmetic. c) Convert hexadecimal number $(2A7)_{16}$ into Decimal number. d) Convert binary number $(01010001)_2$ into Octal number.		CO1	A
ii)	Explain logical diagram and timing diagram of 4-bit ring counter using D Flip-flop.		CO4	U
iii)	Explain Programmable Logic Array with diagram.		CO5	U
Q.4	Solve any two questions out of three.	16		
i)	Explain Associative law, Distributive law, Commutative law and Absorption law of Boolean Algebra with examples.		CO1	U
ii)	Find the minimum sum of product solution using the Quine-Mc Cluskey method F (a, b, c, d) = m (0, 2, 3, 7, 9, 11,14) + d (1, 8,13)		CO2	A
iii)	Explain 16:1 Multiplexer using VHDL code..		CO6	U

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