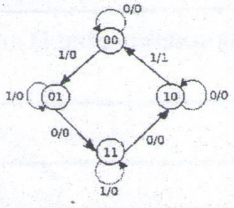
K. J. Somaiya Institute of Technology, Sion, Mumbai-22
(Autonomous College Affiliated to University of Mumbai)

Supplementary Exam August 2023
B.Tech. (Electronics and Telecommunication) Scheme II
Examination: SY Semester: III
Course Code: EXC302 and Course Name: Digital logic Design

Date of Exam: 24-08-23 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 -45.		1	A
ii)	Define FAN-IN and FAN-OUT for logic gates.		2	U
iii)	Using truth table of 4:1 multiplexer, find the Boolean expressions for output variables Y, if D0 and D3 inputs are selected.		3	U
iv)	In the given diagram, what does an arrow between the circles indicate? 		4	U
v)	Explain Flash memories in terms of block of memory.		5	U
vi)	What is VHDL? List the logical operator supported by VHDL.		6	U
vii)	In Master-Slave flip flop, how to select Master and Slave using clock?		5	U
viii)	What will be the output of magnitude comparator if it compares two binary numbers A and B?		4	U
Q.2	Solve any four questions out of six.	16		
i)	Convert binary number $(1001.101)_2$ into decimal number and Octal number $(22.34)_8$ into decimal number.		1	U
ii)	Explain De Morgan's theorem with examples.		1	U

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iii)	Design full adder for three input bits and produces output as sum and carry.		2	U
iv)	Explain S-R latch digital circuit in detail.		4	U
v)	Compare RAM, ROM, EPROM, EEPROM memories.		5	U
vi)	Explain synthesis and modelling in VHDL.		6	U
Q.3	Solve any two questions out of three.	16		
i)	Perform following operation. a) Add -75 to +26 using 8 bit 2's compliment. b) Subtract 14 from 46 using 8 bit 2's comp arithmetic. c) Convert hexadecimal number $(5C7)_{16}$ into Decimal number. d) Convert binary number $(01010100)_2$ into excess-3.		1	A
ii)	Explain logical diagram and timing diagram of 4-bit ring counter using D Flip-flop.		4	A
iii)	Draw and Explain Programmable Array logic .		5	U
Q.4	Solve any two questions out of three.	16		
i)	Explain basic laws of Boolean Algebra with examples.		1	U
ii)	Find the minimum sum of product solution using the Quine-Mc Cluskey method F (a, b, c, d) = m (2, 3, 7, 9, 11, 13) + d (1, 10, 15)		4	A
iii)	Explain Adder and Subtractor using VHDL.		6	U

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