RETEST EXAMINATION, 2020
Semester: 4th semester
Subject code: EI/CO/IT-406
Subject: Digital Electronics (old syllabus)
Full Marks: 70 = (part A-25 + Part B-45)
Duration: 3 hours

Instructions:

1. *Questions on Part A are compulsory*
2. *Answer any five questions from Part B*

PART-A **MARK-25**			
Question 1	Fill in the blanks:		1x10=10
1a	$(11001010001)_2 = (\quad)_{16}$.		
1b	The NOT gate is also known as _____.		
1c	$(784)_8 = (\quad)_2$.		
1d	$(101001011)_2 = (\quad)_{gray}$.		
1e	$(2035)_8 = (\quad)_{16}$		
Question 2	Answer in one word.		
2a	The radix of octal number system.		
2b	A logic gate that performs the operation of Multiplication.		
2c	An arithmetic circuit that adds two binary bits.		
2d	The basic memory element.		
2e	A logic circuit that accepts several data inputs and allows only one of them at a time to get through to the output.		
Question no.3	Write true or false:		1x5=5
3a	The operation performed by an OR gate is similar to logical addition.		
3b	The Commutative Law states that (A + B) +C = A + (B +C)		
3c	NOR and NAND are universal gates.		
3d	An encoder is a logic circuit that converts an N-bit binary input code into M output lines such that one output line is activated for each one of the possible combination of inputs.		
3e	Sequential circuits have memory elements.		
Question no. 4	Match the following:		
Q 4a	1's complement of 10110001010	i. $\overline{A+B} = \overline{A} + \overline{B}$	
4b	Distributive Law	ii. 100100110010	
4c	De-Morgan's Law	iii. 1001110101	
4d	Binary equivalent of $(157)_{10}$	iv. A(B+C) = AB + AC	
4e	BCD code of 932	v. 10011101	
Question no. 5	Choose the correct answer		1x5=5

Q 5a		
i) American Standard Code for for Interchange of Information iii) American Standard Coded form Information Interchange	ii) American Standard Coded Information Exchange iv) American Standard Code for Information Interchange	
5b	Each term in the standard POS form is known as	
i) Sum iii) Maxterm	ii) Minterm iv) Product	
5c	In a K-map, a group of 4 ones that are horizontally or vertically adjacent is known as	
i) Quad iii) Pair	ii) Octet iv) None of the above	
5d	The decimal equivalent of the BCD code 100000111001 is	
i) 901 iii) 638	ii) 839 iv) 136	
5e	The output of an AND gate is HIGH if	
i) both the inputs are LOW iii) one input is LOW	ii) both the inputs are HIGH iv) one input is HIGH	

PART-B, MARK- 45		
	Answer any *five*	
Question no. 6		
Q6a	Draw the logic symbol and construct the truth table of the following gates: NOT gate, XOR gate and NOR gate.	2x3=6
Q5b	State and prove the Duality Theorem.	3
Question no.6		
Q6a	Describe the method to find 2's complement. Find the 2's complement of 1010101010001	2+2=4
Q6b	Reduce the following expression using K-Map $\sum$ m(0,1,2,3,5,7,8,9,10,12,13)	5
Question no. 7		
Q7a	Verify by using truth table method $A + \bar{A}B + AB = A+B$	3
Q7b	Show that $AB + A\overline{B}C + B\overline{C} = AC + B\overline{C}$	3
Q7c	Draw the logic diagram of the expression: $A + \overline{B}C + C\overline{D}$	3
Question no. 8		
Q8a	Describe the operation of a full adder.	3
Q8b	Differentiate between combinational circuit and sequential circuit.	3
Q8c	State Commutative Law and Associative Law of Boolean Algebra.	3
Question no. 9		
Q9a	Define a flip-flop. Describe the operation of a JK flip-flop.	2+5=7

Q9b	What is an asynchronous circuit?	2
Question no. 10		
Q10a	What is a register? What are the various types of registers?	2+3=5
Q10b	Explain the working of a ring counter.	4
Question no. 11		
Q11a	Describe the operation of LED and LCD.	3+3=6
Q11b	What is a Seven Segment Display?	3
Question no. 12	**Write short notes on any *three* :** (a) Multiplexer (b) Subtractor (c) Boolean Algebra (d) Decoders	3×3=9

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