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APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

FIRST SEMESTER MCA DEGREE EXAMINATION, DECEMBER 2017

Course Code: RLMCA109

Course Name: DIGITAL FUNDAMENTALS

Max. Marks: 60 Duration: 3 Hours

PART A

Answer all questions, each carries 3 marks. Marks

1	Convert 3.248 x 10^4 into single precision floating point binary number.	(3)
2	Justify the statement: NAND and NOR gates are universal gates	(3)
3	Specify the minterms of A+BC.	(3)
4	Compare and contrast ripple carry adder and carry look ahead adder.	(3)
5	What is a de-multiplexer?	(3)
6	Differentiate between combinational logic and sequential logic circuits.	(3)
7	Why asynchronous counters are also known as ripple counters?	(3)
8	What do you mean by a Modulo-N Counter?	(3)

PART B

Answer six questions, one full question from each module and carries 6 marks.

Module I

9	a)	Convert 1110001.0001 to decimal and hexadecimal.	(3)
	b)	Given A= 1001010 and B=1000. Perform A-B, A/B and A x B.	(3)
		OR	
10	a)	Convert the pair into binary and add using 2's complement: -72 and 27.	(3)
	b)	Express -34 in sign magnitude, 1's complement form and 2's complement form.	(3)

Module II

11	a)	State and prove (i) A+A'B=A+B, (ii) A+AB=A.	(3)
	b)	State and prove Demorgan's Theorems.	(3)
		OR	
12		Simplify using K-Map y=Σ (0,1,3,5,9,12) +Σd(2,4,6,7)	(6)

Module III

13	Implement the Boolean function F (A, B, C, D) =∑ (1,3,4,11,12,13,14,15) using 8-to-1 multiplexer.	(6)
	OR	
14	Explain the working principle of full adder in detail. Design a full adder using a decoder.	(6)

Module IV

15	J K flip-flop can be used for solving the 'indeterminate state' in SR Flip-flop. Justify the statement.	(6)

OR

16 What is the disadvantage of level triggering? How can we overcome it by using master slave Flip-flop? (6)

Module V

17 Classify shift registers based on the data movement in register. (6)

OR

18 Differentiate between up asynchronous counter and down asynchronous counter with suitable logic diagrams. (6)

Module VI

19 Describe the components of a computer with a block diagram. (6)

OR

20 Explain in detail about the hardware and software components of an Arduino board. (6)

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