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C1E002S

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Reg. No._____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

FIRST SEMESTER MCA DEGREE EXAMINATION, JULY 2017

RLMCA109: DIGITAL FUNDAMENTALS

Max Marks: 60 Duration: 3 Hours

PART A

Answer All Questions. Each question carries 3 marks.

1. Convert the decimal number 59.25 into binary.
2. State the theorems in Boolean Algebra.
3. Convert the expression A′B′C′ + A′BC′ + A′BC + AB′C + ABC into standard Product of Sum form.
4. Distinguish between combinational and sequential circuits.
5. Explain the working of parity generator and checker.
6. What is D Flip flop? Explain with truth table.
7. What are applications of shift registers?
8. List the applications of counters.

PART B

Answer any one question from each module. Each question carries 6 marks.

MODULE I

9. Perform the following number conversions.
   a. $(632.61)_8$ into decimal.
   b. $(423)_{10}$ into Hexadecimal.
   c. $(11011.01)_2$ into decimal.

OR

10. Perform the following operations.
    a. Using 2's complement, perform 83-16.
    b. Multiply 101000_2 by 10100 in binary.
    c. Divide 115 ÷ 5 in binary.

MODULE II

11. Simplify the Boolean function F (ABCD) = ∑ m(2,4,6,8,9,10) + ϕm (5,7,11,14,15) and implement the circuit.

OR

12. Simplify the given Boolean expression using Boolean laws and theorems.
    (A′BC + AB′C″)′

MODULE III

13. With a neat logic circuit, explain the design of a parallel binary adder.

OR

14. Distinguish Multiplexer and Demultiplexer with examples.

MODULE IV

15. Implement an RS flip flop with NAND gates. What are its problems? How is it rectified?

OR

16. With the help of relevant diagrams, explain the working of Edge triggered flip flops.

MODULE V

17. Explain the working of the bidirectional shift Registers.

OR

18. Design a Modulo 3 synchronous counter.

MODULE VI

19. Describe the components of a motherboard.

OR

20. Distinguish the architectural difference of Arduino and Raspberry Pi.

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