Reg. No._____   Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
FIRST SEMESTER REGULAR MCA DEGREE EXAMINATION, DEC 2016

Course Code: RLMCA109
Course Name: DIGITAL FINDAMENTALS

Max. Marks: 60   Duration: 3 Hours

PART A
Answer All Questions
Each question carries 3 marks

1. Perform the following binary operations using the given unsigned numbers.
   a. 11011100.011 + 100111.11
   b. 11101 ÷ 101

2. Simplify the Boolean expression $(\overline{\overline{A}\,B\,\overline{C}}) + (\overline{A\,\overline{B}\,C})$

3. Which gates are called universal gates? Why it is called so?

4. What is a demultiplexer? Discuss the differences between a demultiplexer and a decoder.

5. What is parity generator and checker?

6. What is a Flip Flop? Why is it called a bistable multivibrator?

7. What is a register?

8. What is a shift register? Can a shift register be used as a counter? If Yes how?

PART B

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

9. How can you represent single precision floating point numbers? Give example.

Or

10. Represent the following decimal numbers in 8bit 1's complement and 8bit 2's complement form.

       i.   24   ii. -90   iv. 100   (3 x 2)

11. Minimize the following logic function using K-maps and realize using two input NAND gates.

       F(A,B,C,D) =∑m(1,3,5,8,9,11,15) + d(2,13)

Or

12. A combinational circuit has 3 inputs A, B, C and output F.

    F is true for following input combinations

    A is False, B is True

    A is False, C is True

    A, B, C are False

    A, B, C are True

    (i) Write the Truth table for F. Use the convention True=1 and False = 0.

    (ii) Write the simplified expression for F in SOP form.

    (iii) Draw logic circuit using minimum number of two input gates.   (3x2)

13. What is a full adder? Draw the block diagram and explain the working of a binary
     adder, which can be used to add two 4-bit binary numbers.

Or

14. Implement the three variable function given by F (A, B, C) =$\sum$m (1, 3, 5, 6)
    using a Multiplexer

15. Convert RS flip flop to JK flip flop and draw the block diagram

Or

16. Draw the diagram of a Master-slave J-K flip-flop. What is race around condition? How
    is it eliminated in a Master-slave J-K flip flop?

17. Design a mod-12 Synchronous up counter

Or

18. Using D-Flip flops and waveforms explain the working of a 4-bit SISO shift register.

19. Draw the block diagram and explain the basic component of a PC

Or

20. What is Raspberry Pi? Explain the architecture of Raspberry.