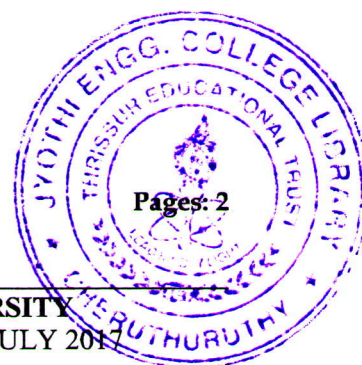C

B3C037S

Reg. No._____   Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
THIRD SEMESTER B.TECH DEGREE EXAMINATION, JULY 2017

CS203: SWITCHING THEORY AND LOGIC DESIGN (CS)

Max. Marks: 100   Time: 3 Hours.

PART A

Answer all questions. Each carries 3 marks.

1. Convert the following decimal numbers to binary a) 12.0625 (b) 673.23.
2. Simplify the Boolean function $(x+y)(x+y')$ to a minimum number of literals.
3. Obtain the 1's and 2's complements for the following binary numbers: (a) 1010101 (b)0000001
4. Prove using the Boolean algebraic theorems that $x + xy = x$.

PART B

Answer any two questions. Each carries 9 marks.

5. a) Write notes on the different precision schemes used for floating point number representation.   (4)
   b) Design a digital circuit with 3 inputs such that the output is equal to 1 if the majority of inputs are equal to 1. The output is 0 otherwise. Derive the truth table and obtain the simplified Boolean expressions.   (5)
6. Simplify the following Boolean function by means of tabulation method.
   $F(w,x,y,z) = \sum (1,4,6,7,8,9,10,11,15)$
7. a) Describe the different schemes for representing negative numbers in binary with proper examples.   (5)
   b) Perform the subtraction of following binary numbers using 2's complement representation. (i) 11010 – 10000 (ii) 100 – 110000   (4)

PART C

Answer all questions. Each carries 3 marks.

8. Give the design and circuit for a half adder.
9. Differentiate between edge triggered and level triggered flip flops.
10. Show how an XOR gate is implemented using NAND gates only.
11. What is meant by race condition in a flip flop?

PART D

Answer any two questions. Each carries 9 marks.

12. a) Describe the design and function table for a 4 to 1 line multiplexer.   (5)

    b) Draw the circuit and explain the working of Master Slave JK flip flop.   (4)

13. Design a code converter for converting BCD to Excess 3 code. (Circuit not required).

14. Explain how clocked sequential circuits can be designed with state equations, using an example.

PART E

Answer any four questions. Each carries 10 marks.

15. Design and implement a 4 bit binary synchronous up counter.

16. Design a Johnson counter and explain its working.

17. Draw and explain the flow chart for addition and subtraction of two binary numbers in sign magnitude form.

18. Describe the working of Programmable Logic Array (PLA) with a block diagram and a simple example.

19. a) Write notes on Read Only Memory.   (5)

    b) Explain how shift registers can be used for serial transfer.   (5)

20. a) Give the logic circuit for a BCD ripple counter.   (5)

    b) Write notes on Random Access Memory.   (5)

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