Code No: RT22022 **R13** SET - 1

II B. Tech II Semester Supplementary Examinations, November-2017
SWITCHING THEORY AND LOGIC DESIGN
(Com. to EEE, ECE, ECC, EIE)

Time: 3 hours Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. Answer **ALL** the question in **Part-A**
3. Answer any **THREE** Questions from **Part-B**

~~~~~~

PART –A

1. a) Explain different methods used to represent negative numbers in binary system.
   b) Draw 3-variable and 4-variable K-map and define pair, quad and octet.
   c) Which gate can be used as parity checker? Why?
   d) Write short notes on RS Flip Flop using NAND gates.
   e) A clocked sequential circuit is provided with a single input x and single output Z. Whenever the input produce a string of pulses 1 1 1 or 0 0 0 and at the end of the sequence it produce an output Z = 1 and overlapping is also allowed. Obtain State - Diagram.
   f) Write a short notes on PROM.

PART -B

2. a) Reduce the following Boolean Expressions :
   i) AB+A(B+C)+B'(B+D) ii) A+B+A'B'C
   iii) A'B+A'BC'+A'BCD+A'BC'D'E iv) ABEF+AB(EF)'+(AB)'EF
   b) Obtain the Dual of the following Boolean expressions.
   i) x'yz+x'yz'+xy'z'+xy'z ii) x'yz+xy'z'+xyz+xyz'
   iii) x'z+x'y+xy'z+yz iv) x'y'z'+x'yz'+xy'z'+xy'z+xyz'

3. Simplify the following Boolean expressions using K-map and implement them using NOR gates: i) F (A, B, C, D) = AB'C' + AC + A'CD'
   ii) F (W, X, Y, Z) = W'X'Y'Z' + WXY'Z' + W'X'YZ + WXYZ.

4. Design a combinational circuit that converts a decimal digit from 2,4,2,1 code to 8, 4,-2,-1 code.

5. a) List the PLA programming table for the BCD to excess-3 code converter.
   b) A ROM chip of 4,096 x 8 bits has two clip select inputs and operates from a 5-volt power supply. How many pins are needed for the integrated circuit package? Draw the block diagram of this ROM.

6. a) What is race around condition? How it is avoided in master-slave JK flip-flop. Explain with necessary diagrams.
   b) Draw the logic diagram of an SR latch with control input using NAND gates.

7. a) Write the differences between Mealy and Moore type machines.
   b) A sequential circuit has 2 inputs $w1$=$w2$ and an output z. It's function is to compare the i/p sequence on the two i/p's. If $w1$=$w2$ during any four consecutive clock cycles, the circuit produces, z = 1 otherwise z = 0, $w1$= 0110111000110, $w2$= 1110101000111, z=0000100001110.
~~~~~~