Code No: RT21053 **R13** SET - 1

II B. Tech I Semester Supplementary Examinations, Oct/Nov- 2017
DIGITAL LOGIC DESIGN
(Com. to CSE, IT)

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**

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PART –A

1. a) What are the advantages of 2's complement? (3M)
   b) Prove $A + \bar{A}B = A + B$ (3M)
   c) Implement function $f = AB + \bar{A}\bar{B}$ using 2X1 MUX (4M)
   d) Write the difference between combinational circuit and sequential circuit (4M)
   e) Draw the 3 bit Ripple counter logical diagram (4M)
   f) Write the difference between PLA and PAL (4M)

PART -B

2. a) Convert the following numbers to decimal. $(10101001.0101)_2$, $(12020)_3$, $(1023.2)_4$, $(40123)_5$, $(0.354)_6$, $(45)_7$, $(8.3)_9$, $(A10)_{12}$ (8M)
   b) Explain about Weighted and non-weighted codes (8M)

3. a) For the Boolean function (8M)
   F = x$\bar{y}$z + $\bar{x}\bar{y}$z + $\bar{w}$xy + w$\bar{x}$y + wxy
   (i) Obtain the truth table of F. (ii) Use Boolean algebra to simplify the function to a minimum number of literals
   b) Draw the multiple-level NAND circuit for the following expression: (8M)
   $w\,(x + y + z) + xyz$

4. a) Explain about Ripple Adder/Subtractor using 2's complement method (8M)
   b) Design a 4 input priority encoder with input D_0 having the highest priority and D_3 the lowest priority. (8M)

5. a) What are the limitations of JK flip flop? Explain how can eliminated those limitations (8M)
   b) Conversion of JK flip flop to SR flip flop (8M)

6. a) What is the difference between a serial and parallel transfer? Explain how to convert serial data to parallel and parallel to serial. (8M)
   b) Design a synchronous BCD counter with JK flip-flop (8M)

7. A Combinational circuit defined by functions (16M)
   $w(A,B,C,D) = \sum(2,12,13)$ $x(A,B,C,D) = \sum(7,8,9,10,11,12,13,14,15)$
   $y(A,B,C,D) = \sum(0,2,3,4,5,6,7,8,10,11,15)$ $z(A,B,C,D) = \sum(1,2,8,12,13)$
   Implement circuit with PAL
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