

**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**

**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)  
 $F = x\bar{y}z + \bar{x}yz + \bar{w}xy + w\bar{x}y + wxy$   
 (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