8/06/15 S.E. Biomed IV 8/6/15

Logic ~~dld~~ Circuit.

B 21 BM/IV/CBGS/LC

Q.P. Code : 3585

(3 Hours) [Total Marks : 80

N.B. : (1) Question No. 1 is compulsory.
(2) Attempt any three questions out of remaining five.
(3) Assume suitable data if necessary, stating your assumption.

1. Solve any four. 20
   (a) Explain reflective codes with example.
   (b) Explain using boolean laws & implement using logic gates
   $y = \overline{AB}(B + C) + AB\overline{(B + C)}$
   (c) Design half subtracter using NAND gates.
   (d) Convert JK FilpFlop to T FlipFlop.
   (e) Explain with respect to FlipFlop.
      (i) Level triggering
      (ii) Edge triggering

2. Reduce the following function using Quine MCclusky method implement using NAND gates. 20
   $Y = f(A, B, C, D) = \Sigma m (0, 1, 4, 5, 6, 7, 9, 10, 15) + d (11, 14)$

3. (a) Design a 2 bit magnitude comparater compare $(A_1 A_0)$ with $(B_1 B_0)$ 10
   (b) Explain bidirectional shift register. 5
   (c) What is Shaft position encoding. 5

4 (a) Convert JK FlipFlop to
      (i) T FlipFlop 3
      (ii) D FlipFlop 3
      (iii) Mn FlipFlop with following truth table 4

M	N	Q_{N+1}
0	0	0
0	1	Q_n
1	0	$\overline{Q}_n$
1	1	1

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(b) Implement following Function using 8 : 1 multiplexer 10

$f = \Sigma m\ (2, 3, 6, 9, 10, 11, 14, 15)$

5. (a) Draw & Explain 2 input TTL NAND gate. 5

(b) Design a 3 bit MOD 5 assynchronous counter using Flipflop 10

(c) Explain 5 & 6 variable k maps. 5

6. (a) Write a short note on decoder. 5

(b) What is Hamming code. Explain with example. 5

(c) What is ASCII code ? 5

(d) Reduce the following & implement using NAND gates 5

$f(A, B, C) = \Pi M\ (1, 2, 4, 7)$