B.E. DEGREE END SEMESTER EXAMINATIONS, NOV / DEC 2011

BIOMEDICAL ENGINEERING

THIRD SEMESTER – (REGULATIONS 2008)

EC 9251 DIGITAL ELECTRONICS AND SYSTEM DESIGN

Time: 3 hrs Max. Marks: 100

Answer **ALL** Questions

Part – A (10 x 2 = 20 Marks)

1. What is an alphanumeric code? Give 2 examples.

2. Write the Boolean expressions for the signals (A>B), (A<B) and (A=B) where A and B are two 2-bit numbers in a 2-bit magnitude comparator.

3. Draw the circuit diagram of a D flip flop.

4. What is race around problem? How is it overcome?

5. Define dynamic hazard.

6. Define essential hazard.

7. A digital circuit with two inputs generates an output that is the square of the input. Draw the circuit diagram to realize the outputs using appropriate ROM.

8. What is an EAPROM?

9. What is the advantage of Totempole TTL over open-collector TTL?

10. Compare TTL and CMOS logic families in terms of fan out, propagation delay, power dissipation and noise margin.

Part – B (5 x 16 = 80 Marks)

11. (a) What are static and dynamic memories.? (4)
    (b) Explain the working of a Basic RAM cell. (8)
    (c) Draw the IC RAM (using RAM basic cells) for 4 words with 3 bits/word. (4)

12(a). Using Quine McCluskey, obtain simplified SOP for
$F(A,B,C,D,E) = \Sigma(0,2,4,6,9,13,21,23,25,29,31)$

OR

12(b). Explain the working of carry look ahead 4-bit adder.

13(a). Explain the working of a BCD ripple counter with a circuit and draw the timing diagrams.

OR

13(b). Obtain the reduced table for the following Mealy Table.

Present State		A	B	C	D	E	F	G	H	I
Next State	**X = 0**	B	D	B	D	F	D	F	F	B
	X = 1	C	B	A	E	G	F	H	I	E
Output	**X = 0**	1	0	0	0	1	0	0	1	0
	X = 1	1	0	1	0	1	0	1	1	0

14(a). Explain critical and non-critical races using appropriate examples.

OR

14(b). Reduce the following flow table and obtain output fill.

Present State	**XY 00**	**01**	**11**	**10**	**Output Z**
1	(1)	2	3	-	0
2	4	(2)	-	5	0
3	6	-	(3)	7	1
4	(4)	8	3	-	0
5	-	8	9	(5)	1
6	(6)	2	9	-	1
7	-	8	3	(7)	0
8	1	(8)	-	5	0
9	1	-	(9)	5	1

15(a). Explain the working of a TTL Tristate Gate.

OR

15(b). Explain the working of CMOS Invertor, NAND and NOR gates.

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