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BIEL-003

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B.TECH. ELECTRONICS AND COMMUNICATION ENGINEERING (BTECVI)

Term-End Examination

December, 2013

BIEL-003 : DIGITAL ELECTRONICS

Time : 3 hours *Maximum Marks : 70*

Note : *(i) Attempt **any seven** questions.*

*(ii) Each question carry **equal** marks.*

1.	(a)	What do you mean by the Gray code ? What are its applications ?	**4**
	(b)	Convert $(562.3)_{10}$ into octal.	**2**
	(c)	Express -6 in 2's complement form using 8-bits.	**2**
	(d)	Express the decimal number $(97)_{10}$ in the Excess-3 code.	**2**
2.	(a)	Simplify the following equation using Karnaugh mapping. $Y = \overline{A}\,\overline{D} + A\,\overline{B}\,\overline{D} + \overline{A}\,\overline{C}\,D + \overline{A}\,C\,D$.	**5**
	(b)	Convert the following expression to sum of product form. $F=(X+Y)\,(\overline{Y}+Z)\,(\overline{X}+Z)$.	**5**
3.	(a)	How does the look-ahead carry adder speed up the addition process ?	**5**
	(b)	Design and implement a 4-bit binary to gray converter.	**5**

4. (a) Distinguish between combinational and sequential switching circuits. Give examples to each. 5

(b) The waveforms shown in fig (i) are applied to the edge-triggered J-K flip-flop. Draw the output waveform. 5

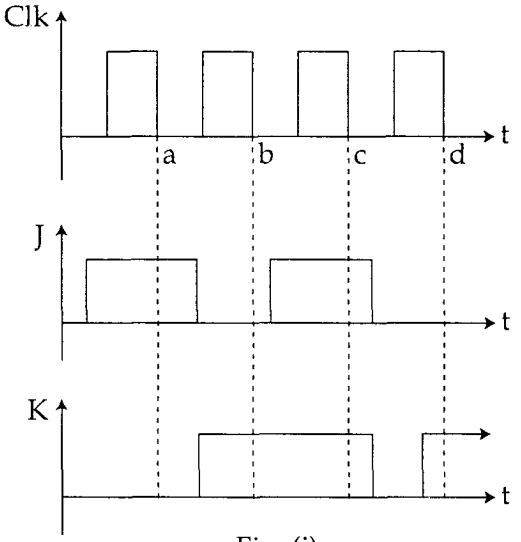

Fig. (i)

5. Design a 4-bit synchronous down counter using JK Flip flop's. Show its timing diagram. 10

6. (a) What do you mean by schottky TTL ? Why it is faster than the standard TTL ? 5

(b) What factors limit CMOS fan-out ? 5

7. Explain random access memories of various types. 10

8. Show how an 8×1 PROM can be programmed to implement the logic function whose truth table is shown in fig (ii). **10**

Truth Table

Inputs			Output
A_2	A_1	A_0	D_{out}
0	0	0	0
0	0	1	0
0	1	0	1
0	1	1	1
1	0	0	0
1	0	1	1
1	1	0	0
1	1	1	1

Fig. (ii)

9. Describe the operation of a CMOS bilateral switch . Is there any TTL bilateral switch ? **10**

10. Write short notes on **any two** : **2x5=10**

(a) Algorithmic state machines.

(b) Pseudo Random Binary sequencing generator.

(c) BCD adder.