B.E. (Computer Engineering) Third Semester (C.B.S.)

Digital Electronics Paper - II

P. Pages :2

Time : Three Hours

0927

Max. Marks : 80

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Notes :   1.   All questions carry marks as indicated.
2.   Solve Question 1 OR Questions No.2.
3.   Solve Question 3 OR Questions No.4.
4.   Solve Question 5 OR Questions No.6.
5.   Solve Question 7 OR Questions No.8.
6.   Solve Question 9 OR Questions No.10.
7.   Solve Question 11 OR Questions No.12.
9.   Assume suitable data whenever necessary.
10   Illustrate your answers whenever necessary with the help of neat sketches.

1.   a)   Perform the following operation.   **8**
   i) $(110101010)_2 \rightarrow ( )_G$
   ii) $(145.34)_D \rightarrow ( )_B$
   iii) $(AB34)_H \rightarrow ( )_D$
   iv) $(146)_D \rightarrow ( )_8$

   b)   State and prove De-Morgan's theorems.   **6**

OR

2.   a)   Explain Fan-in Fan-out and propagation delay properties in detail.   **4**

   b)   What are the SOP and POS form of Boolean expressions?   **4**

   c)   Prove that.   **6**
   i) $\overline{A}BC + A\overline{B}C + AB = AB + AC + BC$
   ii) $A + \overline{A}B + A\overline{B} = A + B$

3.   a)   Design BCD to Excess-3 code converter circuit and explain it   **8**

   b)   Design 1:32 demultiplexer using 1:8 demultiplexer.   **5**

OR

4.   a)   Realize a 5x32 decoder using 3x8 and 2x4 decoder.   **6**

   b)   Explain the characteristics of display devices in detail.   **7**

5.   a)   Design BCD to seven segment decoder using common cathode seven segment display.   **7**

   b)   Explain how demultiplexer can be used as a decoder and vice versa.   **6**

OR

6.	a)	Simplify the following functions using k-map: $F(A, B, C, D) = \Sigma m(1,3,5,8,9,10,11,14) + \Sigma d(2,12)$	**5**
	b)	Simplify the following function using k.Map and realize using NOR gate only. $F(V, W, X, Y) = \Sigma m(2,4,5,8,13) + d(0,9)$	**8**
7.	a)	What is master slave JK flip-flop? Explain the working of JK master slave flip-flop using NAND gate.	**7**
	b)	What is preset and clear input of flip-flop?	**3**
	c)	What do you mean by positive edge triggering and negative edge triggering of flip-flop?	**4**

<div align="center">OR</div>

8.	a)	What is SR flip-flop. Give the truth table of SR flip-flop Implement SR flip-flop using NAND gate and explain the working.	**6**
	b)	Convert JK flip-flop to D flip-flop.	**4**
	c)	Convert D flip-flop to T flip-flop.	**4**
9.	a)	Compare synchronous and asynchronous counter?	**4**
	b)	Design and draw 3-bit synchronous counter which goes through the following states. $1 \rightarrow 3 - 5 - 7 - 1$	**9**

<div align="center">OR</div>

10	a)	Explain 4-bit Johnson counter with truth table and waveform.	**7**
	b)	Design and explain 3-bit up-down ripple counter using T F/F.	**6**
11.	a)	Draw full adder using two half adders and one OR gate.	**6**
	b)	Design 4 Bit BCD adder using 4-bit binary adder.	**7**

<div align="center">OR</div>

12.	a)	Write short notes on.
		   i) BCD Adder.
		   ii) ALU and its Design.
		   iii) Mono stable Multivibrator.
			13

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