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B.E. / B.TECH. DEGREE EXAMINATIONS: NOVEMBER 2009

Third Semester

U07CS305: DIGITAL PRINCIPLES AND SYSTEM DESIGN

(Common to B.E. Computer Science Engineering & B.Tech. Information Technology branches)

Time: Three hours **Maximum Marks: 100**

Answer ALL the Questions:-

PART A (10 x 1 = 10 Marks)

1. Which gate are called universal gate?

A) NOT B) NAND C) OR D) AND

2. In Five Variable K-Map how many number of Combination are there?

A) 16 B) 24 C) 48 D) 32

3. What is meant by MOS?

A) Metal oxide semiconductor B) Metallic oxide semiconductor

C) Metal oxygen semiconductor D) Metallic oxygen semiconductor

4. Which one of the following is Exclusive-OR function?

A)xy'+x'y' B)x'y+xy' C) x'y+xy D) xy+xy'

5. Which one of following not used in combinational circuits?

A)Input B)Output C)Logic gates D)Memory Elements

6. How many input may refered as half adder/subtractor?

A)3 B)4 C)5 D)2

7. What will be next state value of Q in SR Latch when C=1,S=R=1 ?

A)No change B)Q=0,Reset state C)Q=1, Set State D)Indeterminate

8. In case of JK Flip Flop Q(t+1)= set what will be value of JK?

A) J=0,K=0 B) J=0,K=1 C) J=1,K=0 D) J=1,K=1

9. What is meant by PLA?

A) Programmable Logic Array B) Programmable Logical Array

C) Program Logic Array D) Program Logical Array

10. By using k-address line and n outputs in ROM we get

A) 2^k x n B) 2k x n C) $2^{k \times n}$ D) $2k^n$

PART B (10 x 2 = 20 Marks)

11. Simplify the Boolean expression to a minimum number of literals.

a)(x+y)(x+y')

12. Implement the following Boolean function with NAND gates

F(x,y,z)=(1,2,3,4,5,7).

13. State the difference between RTL and DTL circuits.

14. Define Metal Oxide Semiconductor.

15. Draw the circuit diagram for Half-adder and its truth table.

16. Define Multiplexers.

17. State the difference between Sequential circuits and combinational circuits.

18. What is meant by Synchronous counter?

19. State the difference between RAM and ROM.

20. What is meant by PLA?

PART C (5 x 14 = 70 Marks)

21. (a) (i) Using 10's complement, subtract 72532-3250. (6)

(ii) Prove the theorem a) X+1=X b)X+XY=X by using postulate. (8)

(OR)

(b) (i) Simplify the Boolean function F(x,y,z)=€(3.4.6.7). (7)

(ii) Simplify the Boolean function F=A'B'C'+B'CD'+A'BCD'+AB'C' (7)

22. (a) Explain the RTL and DTL circuits with neat diagram.

(OR)

(b) Explain MOS and its Complementary circuits.

23. (a) Design and implementation combinational circuits for 4-bit binary adder and 2-bit binary subtractor.

(OR)

(b) (i) Design 4-Input priority Encoder. (7)

(ii) Design 4-to-1 line Multiplexer. (7)

24. (a) (i) Explain block diagram for sequential circuits and there types. (7)

(ii) Explain master-slave concept in D Flip Flop. (7)

(OR)

(b) Explain State Reduction and Assignment with neat example.

25. (a) Explain 4 x 4 RAM with neat diagram and address multiplexing.

(OR)

(b) Implement the following two Boolean functions with a PLA

$F_1=(AB + AC + BC)'$, $F_2=AB + AC + A'B'C'$

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