B.E. Fourth Semester (Electronics Engineering / Electronics Telecommunication Engineering / Electronics Communication Engineering) (C.B.S.)

Digital Circuits & Fundamental of Microprocessor Paper - IV

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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.
8. Due credit will be given to neatness and adequate dimensions.
9. Illustrate your answers whenever necessary with the help of neat sketches.

1. a) Implement the function in standard SOP form **6**

   $f = AB + A\bar{C} + C + AD + A\bar{B}C + ABC + \bar{B}C$

   b) Simplify the following functions using K-map. **8**

   i) $f(A,B,C,D) = \sum m(0,1,5,9,11,14,15) + d(10,13)$

   ii) $f(PQRS) = \pi m(1,3,9,10,11,14,15) + d(2,7)$

OR

2. a) Design Binary to Gray Code converter and implement the circuit using logic gates. **8**

   b) Explain standard SOP and standard POS forms of Boolean equation. Also explain Min terms and Max terms concept. **6**

3. a) Design a magnitude comparator to compare the magnitude of two, 2 bit binary numbers and draw the logic diagram. **7**

   b) Design 1:32 demultiplexer using 1:8 demultiplexers. **6**

OR

4. a) Implement the following using 3:8 decoder circuit. **8**

   $f_1(A,B,C) = \sum m(0,1,2,4)$
   $f_2(ABC) = \sum m(4,5,6,7)$

   b) Draw and explain the Arithmetic and Logic Unit. (ALU) **5**

5. a) Convert the following. **8**

   i) T flip-flop to S-R flip-flop

   ii) S-R flip-flop to J-K flip-flop.

	b)	Explain how latch can be used as one bit memory cell.	**3**
	c)	Explain the function of preset and clear terminal of flip-flop.	**3**

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

6.	a)	What is master slave J-K flip flop? How is race around condition eliminated by using this configuration.	**8**
	b)	Explain the operation of T and D flip flop using NAND gate.	**6**
7.	a)	Design and draw a 3 bit synchronous counter which goes through the following states: $1 \rightarrow 3 \rightarrow 5 \rightarrow 7 \rightarrow 1$	**7**
	b)	Draw and explain 4 bit Ripple counter with waveform.	**6**

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

8.	a)	Draw the logic diagram of 4 bit serial In serial Out shift register and explain its operation.	**7**
	b)	Write short note on Twisted Ring counter.	**6**
9.	a)	Define the following with respect to digital IC'S.	**8**

        i)   Speed of operation.
        ii)   Power dissipation.
        iii) Figure of Merit.
        iv) Fan in

	b)	Explain content addressable memory.	**5**

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

10.		Write a short notes on **any three.**	**13**

        i)   PAL Device.
        ii)   SRAM Memory.
        iii) TTL family.
        iv) EPROM Memory.

11.	a)	Draw and explain the internal block diagram of 8085, Microprocessor.	**8**
	b)	Explain the flag register of 8085 Microprocessor.	**5**

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

12.	a)	What do you mean by addressing mode? Explain all addressing mode of μp 8085.	**6**
	b)	Explain the following instructions of 8085 Microprocessor.	**7**

        i)   MVI A, 11 H;
        ii)   DAA;
        iii) RST 7.5;
        iv) CALL 1000H;

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