5TH SEM /ELECTRICAL/ 2020(W)NEW
Th3- Digital Electronics & microprocessor

Full Marks: 80 Time- 3 Hrs

Answer any five Questions including Q No.1& 2
Figures in the right hand margin indicates marks

1. Answer **All** questions 2 x 10

   a. What do you mean by Radix of a number?

   b. What is the difference between combinational and sequential logic circuit?

   c. What is the function of ALE in 8085 microprocessor?

   d. Define modulus of a counter.

   e. What are the various modes of 8255 programmable peripheral interface?

   f. Distinguish between a multiplexer & a demultiplexer.

   g. Write down the hardware interrupts in 8085 microprocessor.

   h. What is Race around condition in JK flip-flop?

   i. Find the 2's complement of $(110101.01)_2$.

   j. What are the various flag registers available in 8085 microprocessor?

2. Answer **Any Six** Questions 6 x 5

   a. Explain the working of JK flip-flop with the truth table.

   b. What is half adder? Design a full adder circuit using half-adder and OR gate.

   c. State and prove De-morgan's theorem.

   d. Discuss the various types of addressing modes of 8085 microprocessor with suitable examples.

   e. Explain the function of 1:4 Demux circuit with a neat diagram and write its truth table.

   f. Draw the timing diagram for MVI B, 05_H.

   g Write an assembly language program to add two 8-bit decimal numbers, sum may be of 16 bits.

3 Design a 2-Bit magnitude comparator circuit and explain its operation. 10

4 Draw the functional block diagram of Intel 8085 microprocessor and explain the function of each block. 10

5 Simplify and minimise the four variable logic expression using K map: 10

	$f(A,B,C,D)=\sum m(0,1,2,3,5,7,8,9,10,12,13)$ & implement the real minimal expression in universal logic.	
6	With a neat block diagram design a traffic light controller & write an assembly language program using 8255 Programmable peripheral interface.	10
7	Design a 4-bit Asynchronous counter & draw its timing diagram.	10

5TH SEM./ELECTRICAL./ 2024(W)

TH3 Digital Electronics & Microprocessor

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Answer any five Questions including Q No.1& 2
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1. Answer **All** questions 2 x 10

   a. Convert into decimal system
   (i) $(45.6)_8$ (ii) $(11011.101)_2$

   b. Represent $(101110)_2$ into gray code and EXCESS 3 code.

   c. State Demorgan's theorem.

   d. Encode data bits 1101 into the 7 bits even parity hamming code.

   e. With reference to a JK flip-flop, what is racing? How race around condition can be eliminated?

   f. What are different operating modes of 8255?

   g. What is various status flags provided in 8085?

   h. What is stack and stack top in 8085 microprocessor?

   i. Define modulus of a counter.

   j. Why multiplexers are referred to as data selectors?

2. Answer **Any Six** Questions 5 X 6

   a. Explain different addressing modes of 8085 microprocessor with examples.

   b. Reduce the expression f (A, B, C) = $\sum m(0,2,3,4,5,6)$ using K-map and implement it in NAND logic.

   c. Write down the truth table of full subtractor. Solve the K-map to get the expression for difference and borrow.

   d. Write difference between Memory-Mapped I/O interfacing and I/O Mapped I/O interfacing.

   e. Show that $AB + A\bar{B}C + B\bar{C} = AC + B\bar{C}$

   f. Show the logic diagram of SR flipflop based on NAND gate. Explain its working with truth table.

   g. Draw the timing diagram of instruction MVI M, 52H of 8085 microprocessor.

Answer **Any Three** Questions

3. Design a 2 bit magnitude comparator circuit for whose outputs are A>B, A<B and A=B where A & B are 2 bits binary numbers. 10

4. Write an assembly language program for addition of two 8-bit hexadecimal numbers & sum is 16-bit using 8085 instruction sets. 10

5. Define the working of following pin in connection with Intel 8085A microprocessor: 2 x 5

   i. $\overline{RD}, \overline{WR}$
   ii. INTR, $\overline{INTA}$
   iii. HOLD, HLDA
   iv. S_1, S_0
   v. SID, SOD

6. With neat diagram explain the working of serial-in serial-out and parallel- in parallel out register. 5+5

7. What is Counter? Distinguish between synchronous and asynchronous counter? Design a 4-bit asynchronous counter with a suitable logic diagram & timing diagram. 2+3+5