Course	:	ITE205	- Digital Electronics and Microprocessors	Slot: G1+TG1

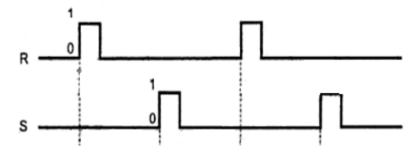Class NBR　　:　3953 / 3956 / 3959

Time　　　　:　Three Hours　　　　　　　　　　　　　　　Max.Marks:100

PART - A (8 X 5 = 40 Marks)
Answer ALL Questions

1. Assume an arbitrary system having a radix of 5 and 0, 1, 2, L and M as its independent bits. Determine

   a) the decimal equivalent of (12 LM.L1);

   b) the total number of possible four-digit combinations in this arbitrary number system.

2. Prove that $A + \overline{A}B = A + B$.

3. Derive the expression for the Carry out of Full Adder.

4. Determine the Functional behavior of the circuit *(Write the Truth Table alone)*

5. The waveform is given as an input to S-R Flip Flop. Determine the Output Q. Assume initially Q = 1.

6. What is the need for A/D & D/A conversion of signals?

7. Write the ALP for Square Root of a given number.

8. Explain Input Handshaking Signal in 8255 PPI.

9.   A chemical reactor has three sensors indicating the following conditions:

i) Pressure (P) is 'low' or 'high'

ii) Temperature (T) is 'low' or 'high'

iii) Liquid level (L) is 'low' or 'high'

   It has two controls: Heater (H) which is either ON or OFF and an inlet valve

iv) Which is either OPEN or CLOSED? The controls are operated as per table

   Using the convention HIGH = 1, LOW = 0, ON = 1.

OFF = 0, OPEN = 1 and CLOSED = 0, draw the Karnaugh maps for H and V.

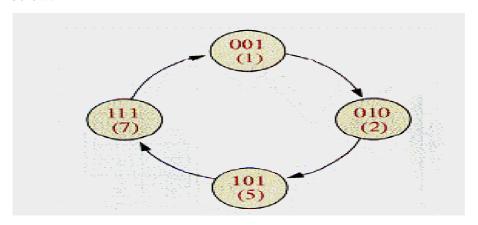*Obtain the minimal SOP and POS expressions for H and V.*

Inputs			Outputs	
P	T	L	H	V
LOW	LOW	LOW	OFF	OPEN
LOW	LOW	HIGH	ON	CLOSED
LOW	HIGH	LOW	OFF	OPEN
LOW	HIGH	HIGH	OFF	CLOSED
HIGH	LOW	LOW	ON	OPEN
HIGH	LOW	HIGH	ON	CLOSED
HIGH	HIGH	LOW	OFF	CLOSED
HIGH	HIGH	HIGH	X	X

X : system shut down

10.   Implement the following Boolean function with 8:1 multiplexer.

   $F(A, B, C, D) = \Sigma\, m(0, 2, 6, 10, 11, 12, 13) + d(3, 8, 14)$

11.   Design a counter with the irregular binary count sequence shown in the state diagram given
below.

12.   Explain the working of SRAM.

13.   Draw the PIN Diagram of DAC0800.

14.   Explain the Performance of DAC.

15.   Explain the addressing modes of 8086 Processor.

16.   Explain the architecture of 8255 PPI.

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