

Part A : (K-map + implementation : 5+15 =20)

- 1) Minimize the following Boolean function using 4-variable K-map.

$$F(A,B,C,D) = \sum(0,1,2,4,5,6,8,9,12,13)$$

OR

- 2) Minimize the following function in SOP minimal form using K-Maps:
 $F(A, B, C, D) = m(1, 2, 6, 7, 8, 13, 14, 15) + d(0, 3, 5, 12)$

Implementation (Boolean Expression, Truth table, and IC number of logic gate)

- 3) Implement the following function with Basic gate: $Y=A+BC$
4) Implement Half adder Circuit in trainer board.

OR

Implement 8 bit Binary to Decimal Decoder in Trainer Board

Part:B (Short question + MCQ) = 30

- 1) What is logic design
- 2) What is the maximum number of outputs a logic gate can have?
- 3) Write IC number of following gate (And, OR, NAND, NOR, NOT)
- 4) Simplify the following Boolean functions to a minimum number of literals.

$$xy + x'z + yz$$

- 5) What is the standard form of S-R flip flop?
- 6) How many flip-flops are required to make a MOD-30 binary counter?
- 7) What is the disadvantage of SR flip-flop?
- 8) A device which converts seven segments to BCD is called

A	B	C	Y
0	0	0	1
0	0	1	1
0	1	0	0
0	1	1	0
1	0	0	1
1	0	1	1
1	1	0	0
1	1	1	0

9) For the truth table of the given figure $Y = \dots\dots\dots$

10) A carry looks ahead adder is frequently used for addition because?

11) The supply voltage and Ground of the 7400 series TTL family IC's is _____

- a) 1V and 0V
- b) 2V and 1v
- c) 0v and 5v
- d) 5V and 0v

12) How many flip-flops are required for storing n bits of information?

13) A 4×1 type of multiplexer has _____ number of selector lines?

14) What are the maximum number of input and output 2 bit Comparator have?

15) The Output state of sequential Circuit depend on what? What elements needs to contain in every sequential Circuit?