## Q-1 Multiple Choice Question:

1] Invert gate has only $\qquad$ input and $\qquad$ output.
a) Two, One
b) One, Two
c) One, One
d) None

2] $A+A^{\prime} B+A^{\prime} B^{\prime}=$ ?
a) 1
b) 0
c) A
d) $A^{\prime}$


3] A $\qquad$ is a combinational circuit that converts binary information from the $n$ coded inputs to a maximum of $2^{n}$ unique outputs
a) Half Adder
b) Decoder
c) Encoder
d) Comparator

4] In k-map, octets eliminates $\qquad$ variable.
a) one
b) two
c) three
d) four

5] A gate is a logic circuit with one or more input signals but only $\qquad$ output signal.
a) two
b) one
c) three
d) four

6] $A$ $\qquad$ is a memory element that stores a binary digit.
a) binary adder
b) decoder
c) multiplexer
d) flip-flop

7] In D flip-flop, when CLK is high then output is $\qquad$ .
a)high
b) low
c)invert of input
d) same as input

8] A $\qquad$ register is the simplest kind of register; all it does store a digital word.
a) shift-left
b) shift-right
c) buffer
d) simple

Q-2 Answer the following in short: (Attempt Any Five)
1] Explain NOR \& NAND gate.
2] Draw the circuit for : $A^{\prime} B+B^{\prime} C+A C^{\prime}$
3] Describe Pair and Quad in k-map with example.
4] Simplify using k-map: $F(A, B, C)=\sum(1,2,5)$
5] Explain half adder in brief.
6] Draw logic circuit of 1's complement adder-subtractor.
7] Draw logic circuit of controlled buffer register.
8] Draw graphical symbol of D flip-flop.
Q-3 Explain Associative law, distributive law and commutative law. OR
Q-3 Explain De'morgan first and second theorem.
Q-4 Explain sum of product (SOP) and product of sum (POS).
OR
Q-4 Define encoder. Explain $8 \times 3$ encoder in detail.
Q-5 Explain full adder in detail.
Q-5 What is multiplexer? Explain $8 \times 1$ multiplexer in detail.
Q-6 Explain shift left and shift right register.
Q-6 Explain ring counters in detai!.
OR

All The Best -----


