

Midterm-F-2021

## PROBLEM 1; GENERAL UNDERSTANDING

1

```
library ieee;
use ieee.std_logic_1164.all;
use ieee.numeric_std.all;
```

entity circuit is  
port(

A : in std\_logic;

B : in std\_logic;

Q : out std\_logic;

P : out std\_logic);

end circuit;

architecture circuit\_arch of circuit is

begin

$Q \leftarrow \text{NOT}(P \text{ AND } \text{NOT}(A \text{ AND } B));$

$P \leftarrow \text{NOT}(Q \text{ AND } B);$

end circuit\_arch;

2.  $(\bar{A} + \bar{B})C + A(B + \bar{C})$

3. as complement  $18 - 25 = 18 + (-25)$

a.  $18 = 010010$  —————  $\rightarrow 010010$   
 $(-25) = 111001 = 100110 + 1 = 100111 \rightarrow 100111$

$$\boxed{111001 = -7}$$