TUTORIAL 1

1. Which is **NOT** an example of analog quantities?
   A. Time
   B. Pressure
   C. Energy
   D. Bandwidth

2. A quantity having discrete value is a _____ quantity.
   A. analog
   B. digital
   C. continuous
   D. natural

3. An analog-to-digital converter (ADC) converts _____ to _____.
   A. discrete signals, discrete digital numbers
   B. continuous signals, discrete digital numbers
   C. continuous signals, discrete analog numbers
   D. discrete signals, discrete analog numbers

4. Determining the number of passengers in a flight is the function of a _____.
   A. Comparator
   B. Encoder
   C. Counter
   D. Multiplexer

5. Which statement **CORRECTLY** describes a COMPARATOR function?
   A. Sending multiple inputs to a destination.
   B. Converting a key press on a keypad to a BCD function.
   C. Determine whether a car exceeds the speed limit.
   D. Memorize characters type on a keyboard.

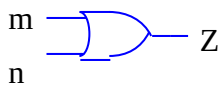
6. Arrange the complexity for fixed-function ICs from **largest** to **smallest**.
   A. ULSI, VLSI, LSI, MSI, SSI
   B. SSI, MSI, LSI, VLSI, ULSI
   C. MSI, LSI, SSI, VLSI, ULSI
   D. VLSI, LSI, MSI, SSI, ULSI

7. Which statement is **NOT** the advantage of Programmable Logic Device (PLD)?
   A. More logic circuit can be ‘stuffed’ into much smaller area.
   B. Certain PLD design can be changed without rewiring or replacing components.
   C. A specific logic function is hardwired in the IC.

D. Can be implemented faster once the required programming language is mastered.

8. Given input **m** is 1 and **n** is 1, determine which circuit has a different output, Z.

A



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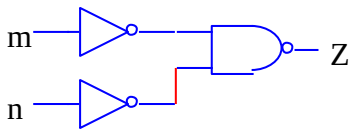

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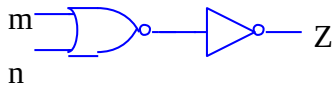

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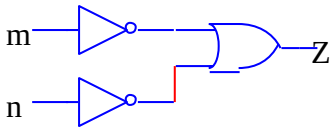
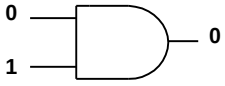
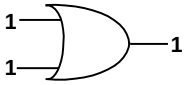


9. Which of the following operation of logic gates is **FALSE**?

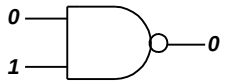
A.



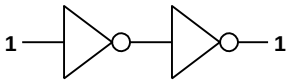
B.



C.



D.



10. Find all the possible values of A and B in the equation, $Z = \overline{A} + \overline{B}$ that makes Z=1.

i. A=0, B=0

ii. A=0, B=1

iii. A=1, B=0

iv. A=1, B=1

A. i, ii and iii

B. ii and iii

C. ii and iv

D. ii, iii and iv

Question 11 [20 Marks]

A digital system with periodic digital waveform has a pulse width, t_w, of 25µs and a period, T, of 150µs.

a) Convert the **period** to the unit of millisecond (ms). [4m]

b) How many **cycles** are there in 10ms? [4m]

c) What is the **frequency** of the system? [4m]

d) Calculate the **on** and **off** state of the system in µs. [4m]

e) Calculate the **duty cycle** of the system. [4m]

Question 12 [15 Marks]

a) Given the input waveform A and B in the logic circuit of Figure 1(a), draw the appropriate **output waveform** for X by filling the Figure 1(b). [9m]

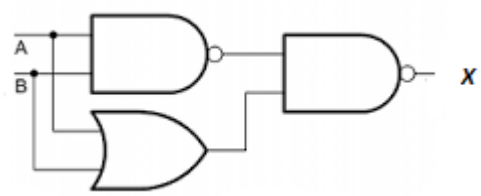


Figure 1(a): Logic circuit

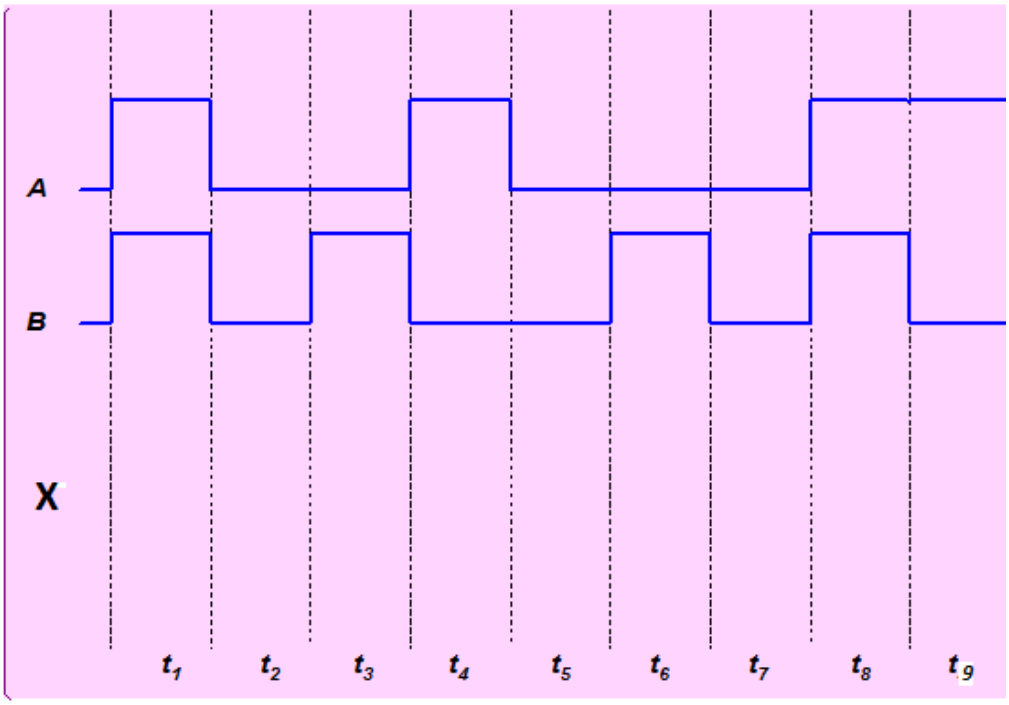


Figure 1(b): Output waveform of logic circuit in Figure 1(a)

b) Fill in the **truth table** of Table 3 below based on your answer in Question 12(a). [4m]

Table 3: Truth table

A	B	X
0	0	
0	1	
1	0	
1	1	

c) Which **single gate** does Table 3 represents? [2m].