| **Course Code:** EE-1005	**Course Name:** Digital Logic Design
Course Teacher: Aamir Ali	**Assignment No:** 02

Instructions for Submission:

1. *Use A4 size paper for solution of each Question.*
2. *You are required to submit an assignment in hardcopy and also upload scanned copy on Google classroom.*
3. *Show all steps, otherwise marks will be deducted.*
4. *The deadline for submission is **15th April, 2022.***
5. ***Copying is not allowed at all.** Any similarities among the submitted files of any student will result in **zero marks**.*

CLO #02   (Total Marks -100)

1. Describe the following in your words:
(a) What is Ripple Carry in Parallel Adder?
(b) Can we use only half adders to add multi bit numbers?
(c) What is issue with normal encoder and what is solution of it?
(d) What is parity and how to check it?

2. Implement Full Adder using:
(e) One 3-8 Decoder
(f) Two 2-4 Decoder
(g) One 8x1 MUX
(h) One 4x1 MUX

3. Construct a 16x1 MUX by using:
(a) Two 8x1 MUX without enable pin and one 2x1 MUX
(b) Two 8x1 MUX with enable pin and one OR gate

4. Implement following given Boolean functions using decoder:
(a) $F(A,B,C,D) = \sum(0,1,2,4,8,9,14)$
(b) $F(A,B,C,D) = \prod(1,2,3,8,9,12,13)$

5. Implement 1x8 De-MUX using 3-8 decoder.

6. Implement 4-bit Parallel Adder with:
(a) Basic gates
(b) Block Diagram

7. The circuit shown below is a 4-bit circuit that can add or subtract numbers in a form used in computers (positive numbers in true form; negative numbers in complement form). Explain what happens when the $\overline{Add}/Subt.$ input is HIGH. What happens when $\overline{Add}/Subt.$ is LOW?
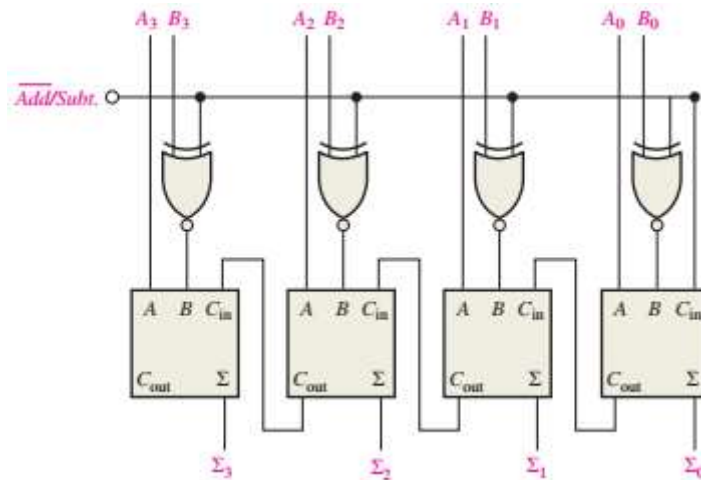
8. Draw Waveform for given circuit:
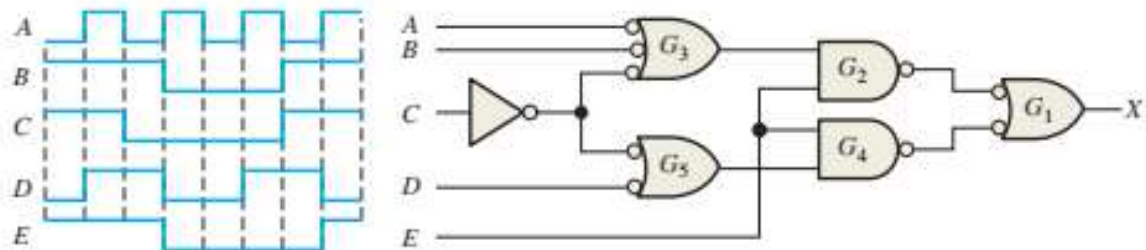
9. Determine the condition when the output of following circuit would be 1 and 0.:

(a)   (b)   (c)