CS221: Digital Design

Examination 1 **Full Marks: 25**

Submission Deadlines: Exam starts at 10:15AM
10:55AM, 21st September 2020 for 100% weightage
11:05AM, 21st September 2020 for 80% weightage
11:15AM, 21st September 2020 for 60% weightage

Instructions:

1. Each question carries 5 marks.
2. You need to write your answers in your copy and submit the scan copy in MS teams. It is time based submission. So, people who submit early will get extra credit.
3. In each page of your submission, writing your name and roll number is must on top of the page (preferably in different color). A page without your name or roll number will not be evaluated.
4. Scan all pages and create a single file for submission with your roll number as file name. Be very specific in your answer. The less number of pages, the less size file you have to upload.
5. Only writing the final answer without any explanation attracts 50% penalty.

Questions:

1. If $(273)_x = (BB)_{16}$ find x ?

2. Find the weight of the codes if following expression is true. Take four bits at a time and convert it to the decimal representation (0-9) according to the weight of the code. Once converted, the number will represent a two digits' decimal number and addition is performed in decimal arithmetic.

   (1011 0101) + (0111 0101) = (1010 1010)

3. Find hamming code for the below message and also write the necessary steps of encoding this message.
   M = 10011010

4. Retrieve the correct message from below hamming code and also write the necessary steps. Note that it is a single message.
   H =100110111100111100010101l

5. Find the self-complementing weighted codes for the decimal numbers (0 to 9) using the weights (3 3 2 1) in a tabular form.