- Due date: 24th March 2020. No submissions accepted after deadline.
- Total questions to be done: 8 (already given in class) + 5 (add acc. to RollNo)
- Refrain from copying.

Roll No 01-33

1. What do you mean by histogram equalisation? Illustrate the process of histogram equalisation for the following 3-bit image.

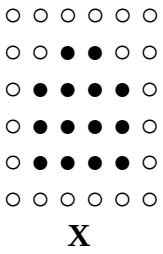
7	6	5	3
0	7	4	5
6	2	2	1
0	1	1	3

2. The table below shows a 3 symbol source with their respective probabilities.

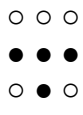
Symbol	Probability
S1	0.8
S2	0.02
S3	0.18

   a) Determine the code word to be assigned to each of the symbols using Huffman Coding.
   b) Determine the coding redundancy and the compression ratio.

3. Given a binary image X and a Structuring Element B with origin as center. Calculate:



X



B

   a) Y1 = X ⊖ B (Erosion)
   b) Y2 = X ⊕ B (Dilation)

4. Mention one application each of erosion and dilation.
5. Consider a 3 X 3 spatial mask that averages the four closest neighbours of a point (x,y), but excluded the point itself from the average. Find the equivalent filter H(u,v) is the frequnecy domain. [**hint**: make use of translation property]

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Roll no 33-70

1. What do you mean by histogram equalisation? Illustrate the process of histogram equalisation on the following image:

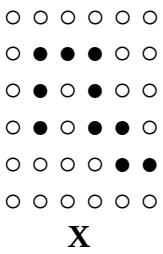
9	8	7	6
8	7	13	5
7	6	5	4
6	1	4	3

2. Construct the Huffman Code for the following:

Characters	A	B	C	D	E	F	G
Frequency	37	18	29	13	30	17	6

The fixed length code is 3 bit. Calculate average bit length and compression ratio.

3. Given a binary image X and a Structuring Element B with origin as center. Calculate:



X

B

   a) Y1 = X ⊖ B (Erosion)
   b) Y2 = X ⊕ B (Dilation)
4. Mention one application each of opening and closing.
5. Consider a 3 X 3 spatial mask given below. Find the equivalent filter H(u,v) is the frequnecy domain. [**hint**: make use of translation property]

0	-1	0
-1	8	-1
0	-1	0