CSE428: Image Processing

Semester: Spring 24
Section: 2
Quiz: 1
Time: 30 mins

Name: [illegible] | ID: [illegible] | Section: [illegible]

Question 1

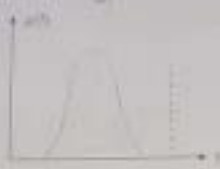
Three images are given in Figs. (a-c), three approximate histograms are given in Figs. (d-f), and three transformations for contrast enhancement are given in Figs. (g-i). For each image, specify which histogram corresponds to that image, and which transformation is best to enhance its contrast. (Complete the table in your script and show explanation.) **[9 marks]**

(a)

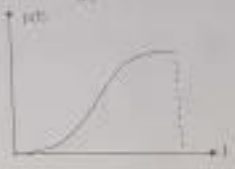
(b)

(c)

(d)



(e)



(f)

(g)

(h)

(i)

Question 2

Write short notes on the following: **[10 marks, 2 marks each]**

a. Brightness discrimination
b. Brightness adaptation
c. Rolling shutter effect
d. Gray level slicing
e. Dynamic range compression and expansion

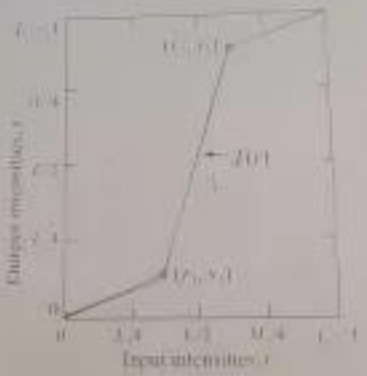
Question 3

The histogram of an image is given in the following table (r_k denotes intensity level, n_k denotes total number of pixels with intensity r_k).

r_k	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
n_k	10	20	11	13	20	13	11	12	15	16	10	26	28	25	21	9

Calculate PDF and CDF for each input pixels r_k. **[12 marks]**

Question 4



Consider (r_1, s_1) *and* (r_2, s_2) as (4,6) and (11,13) respectively and L to be 16. **Determine** the equations for the mapping function depicted in the figure above. **[9 marks]**