77870

IPMVRK 2019-20 solution

Q.1

d) $$\frac{2+4+6+10+25+14+1+3+5}{9}$$

$$= 7.77 \approx 8$$

∴ Image will be

2	4	6
10	8	14
1	3	5

Q.3 a)

Step-1

Grey level	0	1	2	3	4	5	6	7
No. of pixel n_k	0	0	1	5	14	5	0	0

Step-2

Grey level	n_k	PDF $= \frac{n_k}{n}$	CDF ΣPDF	$S_k = (L-1)\cdot$CDF	Round off S_k
0	0	0	0	0	0
1	0	0	0	0	0
2	1	0.04	0.04	0.28	0
3	5	0.2	0.24	1.68	2
4	14	0.56	0.8	5.6	6
5	5	0.2	1	7	7
6	0	0	0	0	0
7	0	0	0	0	0

Hence equalized image is

6	6	6	6	6
6	0	7	6	2
2	7	7	7	2
2	6	7	6	2
6	6	6	6	6

Q.3. b)

Step-1 -- ~~replicate~~ Pad the image with zeros.

Step-2 - Apply 3×3 filter from starting point of an image.

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

1) $\frac{0+0+0+0+1+2+0+4+2}{9}$

$= 1$

2) $\frac{0+0+0+1+2+3+4+2+1}{9}$

$= 1.88 \approx 2$

3) $\frac{0+0+0+2+3+2+2+5+1}{9}$

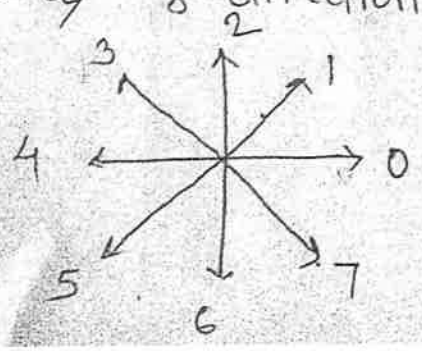
$= 15/9 = 2$

Hence ~~Mean~~ Average image is

Ans =

1	2	2	1
1	3	3	2
2	4	4	3
1	2	3	2

Q.5. a) 8-direction Chain code



Chain code → 6 7 6 7 6 5 5 3 3 2 2 2 2 1 0

Shape number → 6, 7, 8, 7, 8, 8, 0, 6 0, 1, 0, 0, 0, 0, 7, 1

Q. 5. C) Co-occurrence Matrix

Pixel value = 0, 1, 2, 3 so N = 4

size of CM = 4 x 4

Step 1)

i/j	0	1	2	3
0	#(0,0)	#(0,1)	#(0,2)	#(0,3)
1	#(1,0)	#(1,1)	#(1,2)	#(1,3)
2	#(2,0)	#(2,1)	#(2,2)	#(2,3)
3	#(3,0)	#(3,1)	#(3,2)	#(3,3)

Step-2)

i/j	0
0	#(0,0) →

d = 1

θ = Horizontal (0°)

0→0	1	1	
0→0	1	1	
0	2	2	2
2	2	3	3

0→0 } 2
0→0 }

→ Hence first value i.e #(0,0) = 2

final Answer is

2	2	1	0
0	2	0	0
0	0	3	1
0	0	0	1