Q. No	IPMV set 1 Sept 20	Marks
1	For the 8-level image given below, find the digital negative	2

1	2	3
4	5	6
2	1	3

(a)

6	5	4
3	2	1
5	6	4

(b)

6	5	4
3	12	1
5	6	4

(c)

6	5	4
3	2	1
5	6	14

(d)

6	5	4
13	2	1
5	6	4

2	For the 8-level image given below, find the LSB bit plane	2

1	2	3
4	5	6
2	1	3

(a)

1	0	1
0	1	0
0	1	1

(b)

1	0	1
0	0	0
0	1	1

(c)

1	0	1
0	1	0
0	1	0

(d)

1	0	0
0	1	0

0	1	1

3	Which of the following is the averaging mask?	2

(a)

1	1	1
1	1	1
1	1	1

(b)

-1	-1	-1
-1	-1	-1
-1	-1	-1

(c)

1/9	1/9	1/9
1/9	1/9	1/9
1/9	1/9	1/9

(d)

1	1	1
0	0	0
1	1	1

4	The mask used for the line detection is given below,	2

-1	-1	-1
2	2	2
-1	-1	-1

if it is rotated by +45 degrees what will it look like

(a)

-1	-1	-1
2	2	2
-1	-1	-1

(b)

-1	-1	2
-1	2	-1
2	-1	-1

(c)

-1	-1	-1
-2	-2	-2
-1	-1	-1

(d)

-1	-1	-1
2	2	2
1	1	1

5	What is pixel? **elements of a digital image** elements of an analog image cluster of a digital image cluster of an analog image	1
6	The range of values spanned by the gray scale is called: **Dynamic range** Band range Peak range Resolution range	1
7	The edges in gray-level of an image are associated with_____ **High frequency components** Low frequency components DC component No component	1
8	10. What is the relation of the frequencies to a circle of radius D_0, where D_0 is the cut off distance measured from origin of frequency rectangle, for an Ideal High pass filter? **HPF sets all frequencies inside circle to zero** HPF sets all frequencies inside circle to one HPF sets all frequencies to zero HPF sets all frequencies to one	1
9	The absence of receptors is in the retinal area called _____ Lens Ciliary body **Blind spot** Fovea	1
10	In 4-neighbours of a pixel p, how far are each of the neighbours located from p? **one pixel apart** two pixels apart four pixels apart three pixels apart	1
11	The distance between pixels p and q, the pixels have a distance less than or equal to some value of radius r, form a diamond centred at (x,y) is called : Euclidean distance Chessboard distance **City-Block distance** Village distance	1
12	Which of the following is NOT is not a type of Adjacency? 4-Adjacency 8-Adjacency m-Adjacency **100-Adjacency**	1
13	For the given image	2

For question 13:

1	2	3	0
2	4	6	7

| 5 | 2 | 4 | 3 |
| 3 | 2 | 6 | 1 |

Perform Thresholding with T = 4

(a)

0	0	0	0
0	7	7	7
7	0	7	0
0	0	7	0

(b)

0	0	0	0
0	7	7	7
7	7	7	7
0	0	7	0

(c)

0	0	0	0
0	7	7	7
7	0	7	0
7	7	7	7

(d)

7	7	7	7
0	7	7	7
7	0	7	0
0	0	7	0

| 14 | For the given image | 2 |

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

Perform intensity slicing with background with $r_1 = 2$ and $r_2 = 5$

(a)

1	7	7	0
7	7	6	7
7	7	7	7
7	7	6	1

(b)

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

3	2	6	1

(c)

1	7	7	6
7	7	6	7
7	7	7	7
7	7	6	6

(d)

1	7	7	7
7	7	7	7
7	7	7	7
7	7	7	7

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15 Consider the image:-

A =

0	1	0	0
0	1	0	0
0	1	1	0
1	0	0	0

Let the structuring element B = | (1) | 1 |

Perform Erosion

(a)

0	0	0	0
0	0	0	0
0	1	0	0
0	0	0	0

(b)

1	1	1	1
0	0	0	0
0	1	0	0
0	0	0	0

(c)

0	0	0	0
1	1	1	1
0	1	0	0
0	0	0	0

(d)

0	0	0	1
0	0	0	1
0	1	0	1

2

0	0	0	1

16	Consider the image:- A =	2

0	1	0	0
0	1	0	0
0	1	1	0
1	0	0	0

Let the structuring element B = ① 1

Perform Dilation

(a)

1	1	0	0
1	1	0	0
1	1	1	0
1	0	0	0

(b)

1	1	1	1
0	0	0	0
0	1	0	0
0	0	0	0

(c)

0	0	0	0
1	1	1	1
0	1	0	0
0	0	0	0

(d)

0	0	0	1
0	0	0	1
0	1	0	1
0	0	0	1

17	Consider the image:- A =	2

0	1	0	0
0	1	0	0
0	1	1	0
1	0	0	0

Let the structuring element B = ⌈①│1⌉

Perform Opening

(a)

0	0	0	0
0	0	0	0
1	1	0	0
0	0	0	0

(b)

1	1	1	1
0	0	0	0
0	1	0	0
0	0	0	0

(c)

0	0	0	0
1	1	1	1
0	1	0	0
0	0	0	0

(d)

0	0	0	1
0	0	0	1
0	1	0	1
0	0	0	1

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18 Consider the image:-

A =

0	1	0	0
0	1	0	0
0	1	1	0
1	0	0	0

Let the structuring element B = ⌈①│1⌉

Perform closing

(a)

1	0	0	0
1	0	0	0
1	1	0	0
0	0	0	0

(b)

1	1	1	1
0	0	0	0

2

0	1	0	0
0	0	0	0

(c)

0	0	0	0
1	1	1	1
0	1	0	0
0	0	0	0

(d)

0	0	0	1
0	0	0	1
0	1	0	1
0	0	0	1

---

19 Consider the digital image.

0	1	0	6	7
2	0	1	6	5
1	1	7	5	6
1	0	6	6	5
2	5	6	7	6

Calculate the value at point g(2,2)=7 for Median filter (3x3 window)

5
0
1
6

2

---

20 Consider the digital image.

0	1	0	6	7
2	0	1	6	5
1	1	7	5	6
1	0	6	6	5
2	5	6	7	6

Calculate the value at point g(2,2)=7 for Min filter (3x3 window)

5
0
1
6

2

---

21 Consider the digital image.

2

0	1	0	6	7
2	0	1	6	5
1	1	7	5	6
1	0	6	6	5
2	5	6	7	6

Calculate the value at point g(2,2)=7 for Max filter (3x3 window)

5
7
1
6

---

22 Consider the digital image.

0	1	0	6	7
2	0	1	6	5
1	1	7	5	6
1	0	6	6	5
2	5	6	7	6

Calculate the value at point g(2,2)=7 for Average filter (3x3 window)

32/9
31/9
30/9
35/9

2

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23 For the given 4 -chain code, 021312 what is the differential code?
232212
123212
331212
013212

2

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24 p has coordinates (10,1) and q has coordinates (2,8). Find City block distance between p and q.
15
11
12
13

2

---

25 p has coordinates (10,1) and q has coordinates (2,8). Find Chess-board distance between p and q.
8
11
12
13

2

---

26 For the given image

1	2	3	0

2

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

Perform intensity slicing without background with r1 =2 and r2 =5

(a)

1	7	7	0
7	7	0	7
7	7	7	7
7	7	0	0

(b)

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

(c)

1	7	7	6
7	7	6	7
7	7	7	7
7	7	6	6

(d)

1	7	7	7
7	7	7	7
7	7	7	7
7	7	7	7

27

For the 8-level image given below, if the median filter is applied, the result will be

1	2	3
4	50	6
2	1	3

(a)

1	2	3
4	3	6
2	1	3

(b)

6	5	4
3	12	1
5	6	4

(c)

6	5	4
3	2	1
5	6	14

(d)

6	5	4
13	2	1
5	6	4

28	For the 8-level image given below, if the average filter is applied, the result will be	

1	2	3
4	50	6
2	1	3

(a)

1	2	3
4	3	6
2	1	3

(b)

6	5	4
3	12	1
5	6	4

(c)

6	5	4
3	2	1
5	6	14

(d)

6	5	4
13	2	1
5	6	4

29	For the 8-level image given below, if the min filter is applied, the result will be	

1	2	3
4	50	6
2	1	3

(a)

1	2	3
4	1	6
2	1	3

(b)

6	5	4
3	12	1
5	6	4

(c)

6	5	4
3	2	1
5	6	14

(d)

6	5	4

| | | 13 | 2 | 1 | |