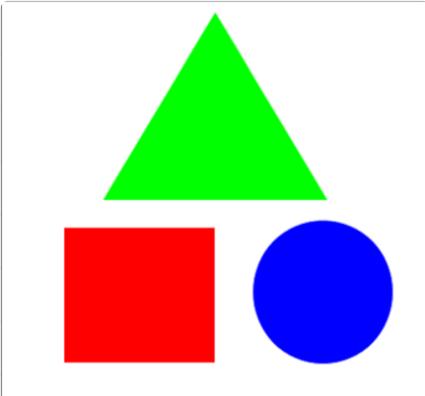
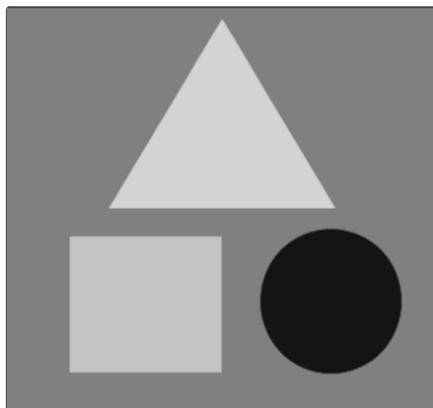


**Started on** Monday, 17 April 2023, 6:09 PM**State** Finished**Completed on** Monday, 17 April 2023, 6:57 PM**Time taken** 47 mins 58 secs**Grade** 8.10 out of 9.00 (90%)**Question 1****Correct** Mark 0.50 out of 0.50

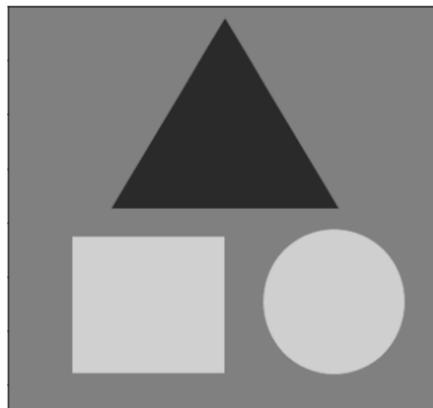
Consider that we convert the image given above from RGB color space to La*b* color space.

Which of the following images corresponds to a* channel and which of them corresponds to b* channel?

Note that larger values are shown with bright color and smaller values are shown with dark color.



1



2

-
- 1 -> *a, 2 -> *b

-
- 1 -> *b, 2 -> *a ✓

Your answer is correct.

The correct answer is:

1 -> *b, 2 -> *a

Question 2

Correct Mark 0.30 out of 0.30

Given the images below, which one is taken using a **smaller** aperture size?**A****B**

- A
- B ✓

Your answer is correct.

The correct answer is:

B

Question 3

Incorrect Mark 0.00 out of 0.30

Given an image, first translating it by $[tx, ty]$ and then rotating it by theta gives the same result as first rotating it by theta and then translating it by $[tx, ty]$.

Select one:

- True ✕
- False

The correct answer is 'False'.

Question 4

Correct

Mark 0.30 out of 0.30



Given the above image, we apply power law (gamma) transformation and obtain the following image:



Which of the following is True?

- Gamma parameter is chosen in the range from 0 to 1.
- Gamma parameter is chosen as greater than 1. ✓

Your answer is correct.

The correct answer is:

Gamma parameter is chosen as greater than 1.

Question 5

Correct

Mark 0.50 out of 0.50

1	1	1		1	1	1	
1	1	1	1	1	1	1	1
1	1	1		1	1	1	

Binary image A

1	1	1
1	1	1
1	1	1

Structuring element B

1	1	1		1	1	1	
1	1	1		1	1	1	
1	1	1		1	1	1	

Binary image C

Given the binary image A, which of the following operations results in the binary image C?

- Apply opening to A using the structuring element B ✓
- Apply dilation to A using the structuring element B
- Apply closing to A using the structuring element B

- Apply erosion to A using the structuring element B

Your answer is correct.

The correct answer is:

Apply opening to A using the structuring element B

Question 6

Correct Mark 0.50 out of 0.50

input image f

	0	1	2	3	4
0	10	80	60	50	20
1	20	40	40	30	20
2	30	10	10	20	60
3	40	10	20	10	40
4	60	10	30	10	30

output image g

	0	1	2	3	4
0					
1					
2			?		
3					
4					

Suppose that we apply 3 x 3 median filtering to the input image f. What is the value of the output image g(2)?

- 30
- 10
- 60
- 40
- 20 ✓

Your answer is correct.

The correct answer is:

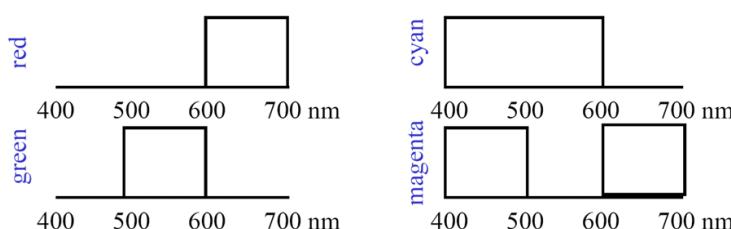
20

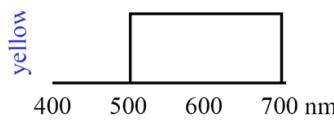
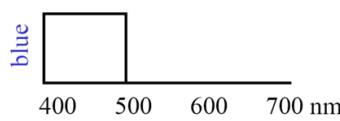
Question 7

Correct Mark 0.30 out of 0.30

Considering the **additive** color mixing, which color do we get if we mix **red** and **blue** light?

Cartoon spectra of the colors is given below:





- Yellow
- Cyan
- Magenta ✓

Your answer is correct.

The correct answer is:

Magenta

Question 8

Correct Mark 0.50 out of 0.50

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

input image A

1	1	1

structuring element B

	0	1	2	3
0		?		
1		?		
2		?		
3				

output image C

When we apply erosion to the input image A using the structuring element B, what are the values of the output image C at (0, 1), (1, 1) and (2, 1)?

- $C(0, 1) = 0, C(1, 1) = 0, C(2, 1) = 0$
- $C(0, 1) = 1, C(1, 1) = 1, C(2, 1) = 1$
- $C(0, 1) = 0, C(1, 1) = 1, C(2, 1) = 0$
- $C(0, 1) = 1, C(1, 1) = 0, C(2, 1) = 1$ ✓

Your answer is correct.

The correct answer is:

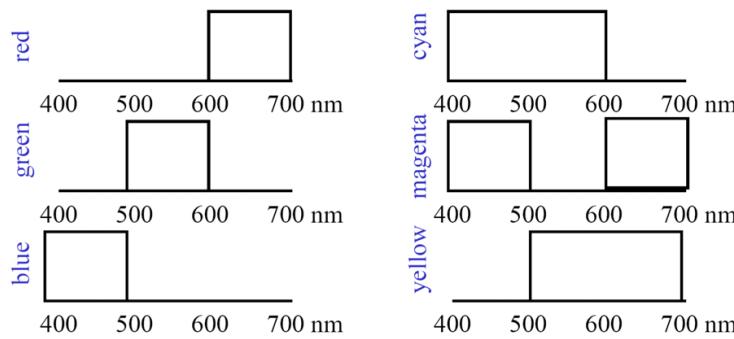
$C(0, 1) = 1, C(1, 1) = 0, C(2, 1) = 1$

Question 9

Correct Mark 0.30 out of 0.30

Considering the **subtractive** color mixing, which color do we get if we mix **cyan** and **yellow** pigments?

Cartoon spectra of the colors is given below:



- Green ✓
- Red
- Blue

Your answer is correct.

The correct answer is:

Green

Question 10

Correct Mark 0.30 out of 0.30

Given the images below, which one is taken using a **smaller** focal length?



A



B

- A ✓
- B

Your answer is correct.

The correct answer is:

A

Question 11

Correct Mark 0.30 out of 0.30

Bilinear interpolation involves the four closest (surrounding) pixels whereas bicubic interpolation involves 16 closest (surrounding) pixels.

Select one:

- True
- False ✓

The correct answer is 'False'.

Question 12

Incorrect Mark 0.00 out of 0.30

For template matching, it takes more time to use normalized cross correlation measure than to use sum of squared difference measure.

Select one:

- True
- False ✗

The correct answer is 'True'.

Question 13

Correct Mark 0.30 out of 0.30

Find the correct matching.

Responsible for color vision

Cones ✓

A term used to refer to the colorfulness

Saturation ✓

Responsible for gray scale vision

Rodes ✓

A feature of the human color perception system which ensures that the perceived color of objects remains relatively constant under varying illumination conditions.

Color constancy ✓

A term used to refer to the kind of color, regardless of its attributes

Hue ✓

Your answer is correct.

The correct answer is:

Responsible for color vision → Cones,

A term used to refer to the colorfulness → Saturation,

Responsible for gray scale vision → Rodes,

A feature of the human color perception system which ensures that the perceived color of objects remains relatively constant under varying illumination conditions. → Color constancy,

A term used to refer to the kind of color, regardless of its attributes → Hue

Question 14

Correct Mark 0.50 out of 0.50

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

input image A

1		
	1	1

structuring element B

	0	1	2	3
0		?		
1		?		
2		?		
3				

output image C

When we apply dilation to the input image A using the structuring element B, what are the values of the output image C at (0, 1), (1, 1) and (2, 1)?

- $C(0, 1) = 1, C(1, 1) = 0, C(2, 1) = 1$
- $C(0, 1) = 0, C(1, 1) = 0, C(2, 1) = 0$
- $C(0, 1) = 0, C(1, 1) = 1, C(2, 1) = 1$ ✓
- $C(0, 1) = 1, C(1, 1) = 1, C(2, 1) = 0$

Your answer is correct.

The correct answer is:

$C(0, 1) = 0, C(1, 1) = 1, C(2, 1) = 1$

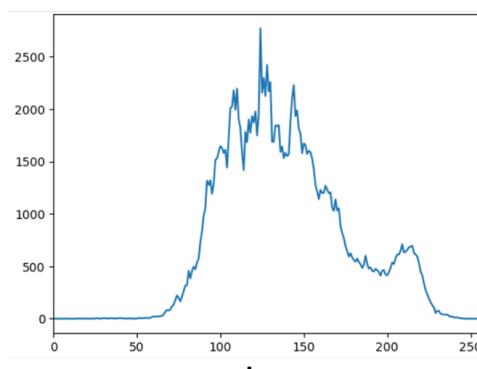
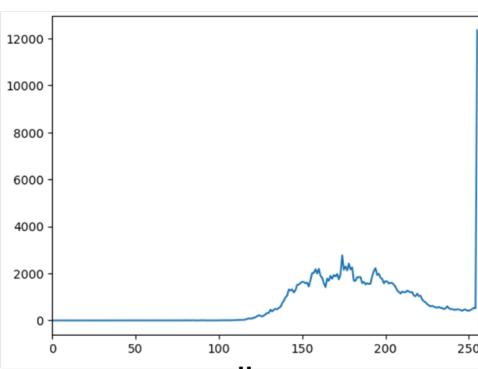
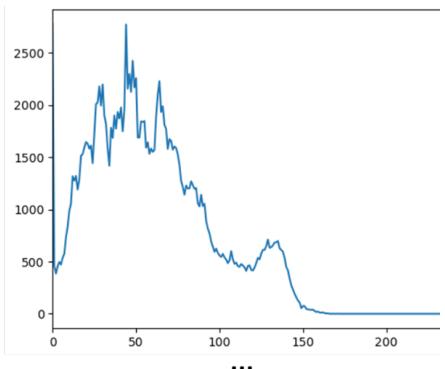
Question 15

Correct Mark 0.30 out of 0.30



**A****B****C**

Given the images above and the histograms below, what is the correct matching between them?

**I****II****III**

- A **III** ✓
- B **I** ✓
- C **II** ✓

Your answer is correct.

The correct answer is:

A → III,

B → I,

C → II

Question 16

Incorrect Mark 0.00 out of 0.30

For salt-and-pepper noise, median filter gives better result than the Gaussian filter.

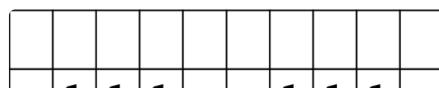
Select one:

- True
- False ✕

The correct answer is 'True'.

Question 17

Correct Mark 0.50 out of 0.50



	1	1	1			1	1	1	
1	1	1	1	1	1	1	1	1	
1	1	1			1	1	1		

Binary image A

1	1	1
1	1	1
1	1	1

Structuring element B

	1	1	1		1	1	1	1	
1	1	1	1	1	1	1	1	1	
1	1	1	1	1	1	1	1	1	

Binary image C

Given the binary image A, which of the following operations results in the binary image C?

- Apply opening to A using the structuring element B
- Apply dilation to A using the structuring element B
- Apply closing to A using the structuring element B ✓
- Apply erosion to A using the structuring element B

Your answer is correct.

The correct answer is:

Apply closing to A using the structuring element B

Question 18

Correct Mark 0.30 out of 0.30

What is the storage requirement for 256 x 512 colored image where each pixel takes 24 bits?

- 768 KB
- 128 KB
- 384 KB ✓

Your answer is correct.

The correct answer is:

384 KB

Question 19

Correct Mark 0.50 out of 0.50

input image f

	0	1	2	3	4
0	10	80	60	50	20
1	20	40	40	30	20
2	30	10	10	20	60
3	40	10	20	10	40

filter w

1	2	1
0	0	0
-1	-2	-1

output image g

	0	1	2	3	4
0					
1					
2					
3					?

4	60	10	30	10	30
---	----	----	----	----	----

4					
---	--	--	--	--	--

Suppose that we apply correlation to the input image f using the filter w . What is the value of the output image $g(3, 3)$?

- 30
- 40
- 30 ✓
- 20
- 40

Your answer is correct.

The correct answer is:

30

Question 20

Correct Mark 0.30 out of 0.30

As we decrease standard deviation of Gaussian filter, the filtering result becomes smoother.

Select one:

- True
- False ✓

The correct answer is 'False'.

Question 21

Correct Mark 1.60 out of 1.60

0	0	1	1
2	2	2	2
2	2	2	2
4	4	5	5

Consider that we apply histogram equalization to the 3-bit image ($L = 8$) of size 4×4 given above.

Which input intensity is to be mapped to which output intensity by the histogram equalization?

(You are allowed to use the calculator in your computer.)

input intensity 0 output intensity 1 ✓

input intensity 1	output intensity 2	✓
input intensity 2	output intensity 5	✓
input intensity 3	output intensity 5	✓
input intensity 4	output intensity 6	✓
input intensity 5	output intensity 7	✓
input intensity 6	output intensity 7	✓
input intensity 7	output intensity 7	✓

Your answer is correct.

The correct answer is:

input intensity 0 → output intensity 1,
input intensity 1 → output intensity 2,
input intensity 2 → output intensity 5,
input intensity 3 → output intensity 5,
input intensity 4 → output intensity 6,
input intensity 5 → output intensity 7,
input intensity 6 → output intensity 7,
input intensity 7 → output intensity 7

Finish rev

◀ FFT Example

Jump to...

W08 – Frequency Domain Te