Reg. No.															

Question Paper Code	13550

B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2025

Sixth Semester

Computer Science and Business Systems

20CBEL610 - IMAGE PROCESSING AND PATTERN RECOGNITION

Regulations - 2020

Duration: 3 Hours | Max. Marks: 100

PART - A (MCQ) (10 × 1 = 10 Marks)

Answer ALL Questions

		Marks	K – Level	CO
1.	Among the following, functions that can be performed by digital image processing is___. (a) Fast image storage and retrieval (b) Controlled viewing (c) Image reformatting (d) All of the above	1	K1	CO1
2.	What are the names of the various colour image processing categories? (a) Pseudo-color and Multi-color processing (b) Half-color and pseudo-color processing (c) Full-color and pseudo-color processing (d) Half-color and full-color processing	1	K1	CO1
3.	Region of Interest (ROI) operations is generally known as _____ (a) Masking (b) Dilation (c) Shading correction (d) None of the Mentioned	1	K1	CO2
4.	Which of the following is the primary objective of sharpening of an image? (a) Decrease the brightness of the image (b) Increase the brightness of the image (c) Highlight fine details in the image (d) Blurring the image	1	K1	CO2
5.	Which of the following is an advantage of thresholding in image segmentation? (a) It is computationally expensive (b) It is useful for separating objects from the background in simple images (c) It is not affected by noise (d) It works well for multi-colored images	1	K1	CO3
6.	Which loss function is typically used for training a model in image segmentation tasks? (a) Mean Squared Error (MSE) (b) Binary Cross-Entropy (BCE) (c) Dice coefficient loss (d) Cross Entropy Loss	1	K1	CO3
7.	Which of the following is the goal of connected component analysis in binary image ? (a) To find the average intensity of the image (b) To count the number of connected regions (c) To extract edges from the image (d) To normalize the image intensity	1	K1	CO4
8.	Which type of image registration is most suitable for aligning regions with local deformations? (a) Global Registration (b) Local Registration (c) Both global and local are equally effective (d) Neither global nor local are suitable for such deformations	1	K1	CO4
9.	Which color model is primarily used in color printing? (a) RGB (b) CMY (c) HIS (d) YCbC	1	K1	CO5
10.	The 'I' component in the HSI color model corresponds to (a) Intensity (b) Illuminance (c) Image clarity (d) Illumination	1	K1	CO5

PART - B (12 × 2 = 24 Marks)

Answer ALL Questions

11.	Define an image.	2	K1	CO1
12.	What are the two major approaches used in image compression?	2	K1	CO1
13.	Compare and Contrast Sampling and Quantization.	2	K2	CO1

14.	What is the role of contrast stretching?		*2*	*K1*	*CO2*
15.	Define a normalized Histogram.		*2*	*K1*	*CO2*
16.	Compare and contrast linear spatial filter and non linear spatial filter.		*2*	*K2*	*CO2*
17.	What are two approaches to segmentation?		*2*	*K1*	*CO3*
18.	Show the importance of discontinuity in an image using segmentation.		*2*	*K1*	*CO3*
19.	What is convex hull?		*2*	*K1*	*CO4*
20.	Define image registration.		*2*	*K1`*	*CO4*
21.	Compare and Contrast brightness and contrast.		*2*	*K2*	*CO5*
22.	What are the two important pre-processing techniques within the computer vision field ?		*2*	*K1*	*CO5*

PART - C (6 × 11 = 66 Marks)

Answer ALL Questions

23.	a)	Explain the image processing techniques in detail.	*11*	*K2*	*CO1*
		OR			
	b)	Explain image sensing and acquisition with a neat diagram.	*11*	*K2*	*CO1*
24.	a)	Summarize the basics of intensity transformation and spatial filtering.	*11*	*K2*	*CO2*
		OR			
	b)	Illustrate Intensity transformation functions in detail.	*11*	*K2*	*CO2*
25.	a)	Explain region based segmentation and region growing with examples.	*11*	*K2*	*CO3*
		OR			
	b	Explain the various Edge Detection Methods in detail.	*11*	*K2*	*CO3*
26.	a)	Explain the need for Connected Component Analysis and explain.	*11*	*K2*	*CO4*
		OR			
	b)	Illustrate the concept of interpolation.	*11*	*K2*	*CO4*
27.	a)	Explain CMY colour model.	*11*	*K2*	*CO5*
		OR			
	b)	Explain the pseudo colour image processing in detail.	*11*	*K2*	*CO5*
28.	a) (i)	Summarize Distance Transform Medial Axis Transform.	*6*	*K2*	*CO4*
	(ii)	Compare and contrast False colour and Pseudo colour in detail.	*5*	*K2*	*CO5*
		OR			
	b) (i)	Explain the basic concepts of image registration in detail and the need for it.	*6*	*K2*	*CO4*
	(ii)	Explain in detail YCbCr.	*5*	*K2*	*CO5*