

Department of Computer Science & Engineering
School of Engineering Sciences & Technology
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Odd Semester Examination 2024

Subject Name: Digital Image & Video Processing
Time: 3 Hrs

Subject Code: BTECE DEI41
Maximum Marks: 75 Marks

Section A

Note: All questions are compulsory

(7 x 5 Marks = 20 Marks)

Q.No	Question	CO	BL
Q.1	With the help of suitable diagram, show the elements of visual perception in image processing?	1	2
Q.2	How do you convert an analog image into a discrete image? Explain the process using mathematical model?	1	3
Q.3	What is a kernel in filtering? Consider an input image of your choice and show the concept of different types of grey level intensity transformation function?	2	4
Q.4	With the help of mathematical relation, explain the significance of frequency transform of an image.	3	2
Q.5	Explain the concept of color complements, color slicing, and tone correction?	4	1
Q.6	For the given scan line, derive the 2 nd order derivative. Also, discuss different conditions for 1 st and 2 nd order derivative? Scan Line: 6, 6, 6, 6, 5, 4, 3, 2, 1, 1, 1, 1, 1, 1, 6, 6, 6, 6, 6	3	5
Q.7	Write a short note on any two of the following: a) JPEG and JPEG 2000 b) MPEG and H.26X c) Wavelets in an image	4,5	2

Section B

Note: Attempt any four questions.

(4 x 10 Marks = 40 Marks)

Q.No	Question	CO	BL
Q.1	With the help of a suitable block diagram, show different aspects of image processing? Explain each section of the diagram with suitable examples?	1	3
Q.2	Derive the mathematical expression for histogram? In histogram equalization, what does monotonically increasing and strictly monotonically increasing function in respect to histogram? Prove that PDF of an equalized histogram is a unit function?	2	4
Q.3	For $r \leq 3$, draw the structure for city block distance and chess board distance. Also mention the mathematical relation used to develop these distance? Explain other types of relationship between pixels with the help of suitable examples?	2	5
Q.4	Show the difference between sharpening and smoothening filter. What are advantages and limitations? Explain the concept of 2 nd order derivative used in filtering?	3	3
Q.5	Draw the diagram explaining different types of color model used in color image processing? Explain the significance of each	3	2
Q.6	Explain different concepts of image segmentation, using detection of discontinuities? What are the difference between line, point and edge, how are they related to each other.	4	2

BL- Bloom's Taxonomy Levels (1-Remembering, 2-Understanding, 3-Applying, 4-Analysing, 5-Evaluating, 6-Creating)

CO- Course Outcomes

***** End of Paper *****