K. J. Somaiya Institute of Technology, Sion, Mumbai-22
(Autonomous College Affiliated to University of Mumbai)

~~Nov Dec 2024~~ Jan/Feb 2025

(B.Tech.) Program: AIDS : Scheme IIB
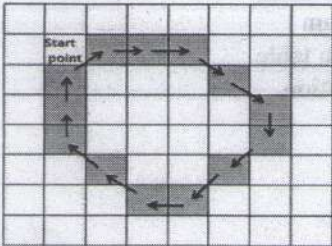Supplementary Examination: TY   Semester: V
Course Code: AIDLC5052 and   Course Name: Image and Video Processing

Date of Exam: ~~2 /12/24~~ 8/2/2025   Duration: 2.5 Hours   Max. Marks: 60

Instructions:
(1) All questions are compulsory.
(2) Draw neat diagrams wherever applicable.
(3) Assume suitable data, if necessary.

		Max. Marks	CO	BT level
Q 1	Solve any six questions out of eight:	10		
i)	Define 1)Euclidean Distance 2)City Block Distance 3)Chessboard Distance	5	CO1	U
ii)	Filter the following image using neighborhood filtering by assuming Zero padding Low Pass Filter, High Pass Filter <table><tr><td>7</td><td>7</td><td>1</td><td>0</td></tr><tr><td>2</td><td>2</td><td>5</td><td>4</td></tr><tr><td>3</td><td>0</td><td>2</td><td>6</td></tr><tr><td>1</td><td>0</td><td>1</td><td>2</td></tr></table>	5	CO2	Ap
iii)	Describe various steps involved in encoding an image using JPEG standard.	5	CO4	U
Q.2	Solve any two questions out of three.	10		
i)	What is shot boundary detection in video processing?	5	CO5	U
ii)	What is motion estimation?	5	CO6	U
iii)	Object detection is a computer vision technique for locating instances of objects in images or videos. To detect any object border identification or shape identification is necessary. Using the above 8 directions identify the shape of a given image. 1) Chain Code 2) First Difference code 3) Shape Number	5	CO3	Ap
Q.3	Solve any two questions out of three.	20		

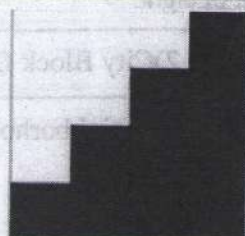Nov Dec 2024 — Jan/feb -2025

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i)	Design Huffman code for given frequencies.						10	CO4	Ap

a	b	c	d	e	f
5	9	12	13	16	45

ii)	Develop a simple explanation of Photometric Image Formation	10	CO5	U
iii)	Segment the following image using split and merge technique. Draw the quadtree representation of the segmented image.	10	CO3	Ap

Q.4	Solve any two questions out of three.	20		
i)	Explain Optical flow equation in details	10	CO6	U
ii)	**Perform** opening and closing operation on the following image using structuring element	10	CO3	Ap

1	1	1

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

iii)	The gray level 0,1,2, 6 and 7 are missing in the given image. Image quality is too poor due to low contrast. Use the method to improve the contrast of image and try to equalize the pixels in each gray level.	10	CO2	Ap

    1) Plot Original Image Histogram
    2) Draw Histogram equalization table
    3) Plot histogram after equalization.
    4) Rewrite Enhanced Image

4	4	4	4	4
3	4	5	4	3
3	5	5	5	3
3	4	5	4	3
4	4	4	4	4

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