

01/3.30

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATION- 2026

B.Tech- 5th Semester (BI)

COURSE CODE (CREDITS):25B1WBI531 (3)

MAX. MARKS: 15

COURSE NAME: Computational Biomedical Image Analysis

COURSE INSTRUCTOR:Lt.(Dr.) Pragya Gupta

MAX. TIME: 1 Hour

*Note: (a) All questions are compulsory.**(b) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems**(c) Use of a calculator is allowed*

Q.No	Question	CO	Marks																									
Q1	Consider the 5x5 image region. Let $V=\{1,2,3\}$. Compute D_m distance between pixel p and q. <table border="1"><tr><td>1</td><td>2(p)</td><td>3</td><td>4</td><td>0</td></tr><tr><td>5</td><td>3</td><td>2</td><td>1</td><td>1</td></tr><tr><td>4</td><td>2</td><td>1</td><td>1</td><td>0</td></tr><tr><td>3</td><td>1</td><td>0</td><td>2</td><td>5</td></tr><tr><td>1</td><td>2</td><td>0</td><td>3</td><td>1(q)</td></tr></table>	1	2(p)	3	4	0	5	3	2	1	1	4	2	1	1	0	3	1	0	2	5	1	2	0	3	1(q)	CO2	2
1	2(p)	3	4	0																								
5	3	2	1	1																								
4	2	1	1	0																								
3	1	0	2	5																								
1	2	0	3	1(q)																								
Q2	How do you determine the ideal pixel size for representing a digital image? Discuss the effects of using very small and very large pixel sizes on image quality.	CO2	3																									
Q3	Briefly explain the basic working principle of CT scanning. Mention one major difference between the images produced by the conventional X-ray and CT scan.	CO1	3																									
Q4	(a) What is Contrast stretching? (b) Draw the basic transformation used for contrast stretching. (c) What modification in the transformation function would be required to obtain a binary image from a grayscale image?	CO2	3																									
Q5	Consider a 5x5, 7-bit grayscale image whose pixel intensities lie in the range $\frac{3L}{4} \leq r \leq (L - 1)$. Identify the suitable operation/transformation to obtain the high-contrast image. Apply the operation/transformation to the image and draw the resulting output image.	CO2	4																									

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