

CBCS SCHEME - Make-Up Exam

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BEC/BTE/BVL613C

Sixth Semester B.E./B.Tech. Degree Examination, June/July 2025

Digital Image Processing

Time: 3 hrs.

Max. Marks: 100

- Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course outcomes.*



Module – 1			M	L	C																			
Q.1	a.	With a block diagram, explain the fundamental steps involved in digital image processing.	10	L2	CO1																			
	b.	Explain the human visual system with a neat diagram.	05	L2	CO1																			
	c.	Consider the image segment shown in Table 1(c) with $V = \{1, 2\}$. Calculate the length of the shortest 4, 8 and m-path between p and q. Table 1(c) <table><tr><td>3</td><td>1</td><td>2</td><td>1</td><td>q</td></tr><tr><td>2</td><td>2</td><td>0</td><td>2</td><td></td></tr><tr><td>1</td><td>2</td><td>1</td><td>1</td><td></td></tr><tr><td>p</td><td>1</td><td>0</td><td>1</td><td>2</td></tr></table>	3	1	2	1	q	2	2	0	2		1	2	1	1		p	1	0	1	2	05	L3
3	1	2	1	q																				
2	2	0	2																					
1	2	1	1																					
p	1	0	1	2																				
OR																								
Q.2	a.	Briefly explain the following : (i) Neighbors of a pixel (ii) Connectivity (iii) City block distance (iv) Checker board distance (v) Region	10	L2	CO1																			
	b.	Explain the Image acquisition using sensor strips and sensor arrays.	10	L2	CO1																			
Module – 2																								
Q.3	a.	Explain the two-dimensional Orthogonal and Unitary Transforms.	10	L2	CO2																			
	b.	Explain discrete cosine transform and its properties.	10	L2	CO2																			
OR																								
Q.4	a.	Explain Haar Transforms with equation and hence obtain 2×2 Haar Transform matrix	10	L2	CO2																			
	b.	State the following properties of 2D-DFT: i) Translation ii) Periodicity iii) Rotation iv) Convolution v) Linearity	10	L2	CO2																			
Module – 3																								
Q.5	a.	With necessary graphs, explain the following intensity transformation functions: i) Image negative ii) Log transformations iii) Power law transformations	10	L2	CO3																			
	b.	Briefly explain Contrast Stretching and Bit plane slicing.	10	L2	CO3																			

1 of 2

OR

Q.6	a.	For a given image 4×4 having gray scales between [0 , 9]. Perform histogram equalization and draw histogram image before and after equalization 4×4 image show in Table 6(a).	12	L3	CO3																
		Table 6(a) <table><tr><td>2</td><td>3</td><td>3</td><td>2</td></tr><tr><td>4</td><td>2</td><td>4</td><td>3</td></tr><tr><td>3</td><td>2</td><td>3</td><td>5</td></tr><tr><td>2</td><td>4</td><td>2</td><td>4</td></tr></table>	2	3	3	2	4	2	4	3	3	2	3	5	2	4	2	4			
2	3	3	2																		
4	2	4	3																		
3	2	3	5																		
2	4	2	4																		
	b.	Explain Laplacian Mask for image sharpening using second order derivatives.	08	L2	CO3																
Module – 4																					
Q.7	a.	With the help of neat diagram, explain basic steps involved in frequency domain filtering.	10	L2	CO4																
	b.	Explain Butterworth LPF and Gaussian LPF for image smoothing.	10	L2	CO4																
OR																					
Q.8	a.	Explain the pseudo colour image processing with examples.	10	L2	CO1																
	b.	Explain different color models used in image processing.	10	L2	CO1																
Module – 5																					
Q.9	a.	With necessary equation and graphs, explain noise probability density functions.	10	L2	CO5																
	b.	Write brief note on restoration in presence of only noise using (i) Mean Filter (ii) Order Statistic Filter (iii) Adaptive Filters	10	L2	CO5																
OR																					
Q.10	a.	Explain the estimation of degradation function methods.	10	L2	CO5																
	b.	Explain Wiener filtering and Inverse filtering in Image restoration.	10	L2	CO5																
