

Basavarajeswari Group of Institutions
BALLARI INSTITUTE OF TECHNOLOGY & MANAGEMENT
 (Autonomous Institute under Visvesvaraya Technological University, Belagavi)

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Course Code

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Fifth Semester B.E. Degree Examinations, April/May 2024

DIGITAL IMAGE PROCESSING

Duration: 3 hrs

Max. Marks: 100

Note: 1. Answer any FIVE full questions choosing ONE full Question from each Module.
 2. Missing data, if any, may be suitably assumed

<u>Q. No</u>	<u>Question</u>	<u>Marks</u>	<u>(RBTL:CO:PI)</u>																		
<u>Module-1</u>																					
1.	a. What is Digital Image? Explain the fundamental steps of DIP.	10	(2 :1 : 1.2.1)																		
	b. For the P and Q of (19,15) and (3,3) find Euclidean, city block and chess board distances.	10	(3 :1 : 1.2.1)																		
(OR)																					
2.	a. Explain with neat diagrams how image is acquired using sensor strips?	10	(2:1 : 1.2.1)																		
	b. If the intensity value at the pixels with coordinates (10,15) is 200, (10,30) is 50, (20,15) is 60 & (20,30) is 90 the find the intensity value at (13, 21) by Bilinear interpolation.	10	(3 :1 : 1.2.1)																		
<u>Module-2</u>																					
3.	a. Describe any five intensity transformations.	10	(2 :2: 1.2.1)																		
	b. For the scanline f(x) find the 1 st and 2 nd derivative (difference) and plot them as well as f(x). 9 9 9 9 9 7 5 3 1 1 1 1 1 5 8 4	10	(3 :2 : 1.2.1)																		
(OR)																					
4.	a. Explain the smoothing of images using Ideal low pass filter and Butterworth low pass filter.	10	(2 :2 : 1.2.1)																		
	b. Perform histogram equalization of a 64*64 image.	10	(3 :2 : 1.2.1)																		
<table><tr><td>Gray level</td><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td></tr><tr><td>Number of Pixels</td><td>790</td><td>1023</td><td>850</td><td>656</td><td>329</td><td>245</td><td>122</td><td>81</td></tr></table>				Gray level	0	1	2	3	4	5	6	7	Number of Pixels	790	1023	850	656	329	245	122	81
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<u>Module-3</u>																					
5.	a. Explain basic model of image restoration and any four noise PDF's.	10	(2 :3 : 1.2.1)																		
	b. Explain the order statistic filters used for image restoration in the presence of noise.	10	(2 :3 : 1.2.1)																		
(OR)																					
6.	a. Explain inverse filtering and wiener filtering.	10	(2 :3 : 1.2.1)																		
	b. What are the three principal ways to estimate the degradation function for use in image restoration and explain them?	10	(2 :3 : 1.2.1)																		

Note: (RBTL - Revised Bloom's Taxonomy Level: CO - Course Outcome: PI- Performance Indicator)

Module-4

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| 7. | a. | Develop a procedure for converting HSI to RGB and vice-versa. | 10 | (2 :4 : 1.2.1) |
| | b. | Explain erosion and dilations transformation for Morphological Image Processing with examples. | 10 | (2 :4 : 1.2.1) |

(OR)

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| 8. | a. | What is image pyramid? Explain the system for creating approximation and prediction residual pyramid. | 10 | (2 :4 : 1.2.1) |
| | b. | What is pseudo colour image processing? Explain intensity slicing. | 10 | (2 :4 : 1.2.1) |

Module-5

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| 9. | a. | Explain the different boundary descriptors. | 10 | (2 :5 : 1.2.1) |
| | b. | Explain minimum perimeter polygon algorithm. | 10 | (2 :5 : 1.2.1) |

(OR)

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| 10 | a. | Explain global thresholding using Otsu's method. | 10 | (2 :5 : 1.2.1) |
| | b. | Describe chain codes with examples. | 10 | (2 :5 : 1.2.1) |

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