

Code: 20EC4701A

IV B.Tech - I Semester – Regular Examinations - DECEMBER 2023

**DIGITAL IMAGE PROCESSING
(ELECTRONICS & COMMUNICATION ENGINEERING)**

Duration: 3 hours

Max. Marks: 70

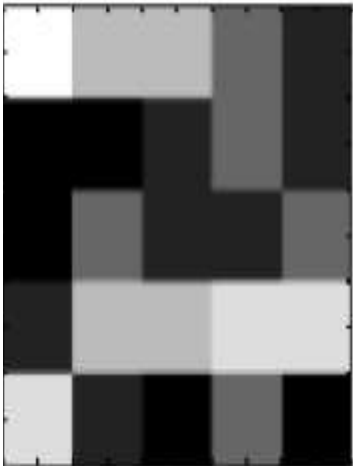
Note: 1. This paper contains questions from 5 units of Syllabus. Each unit carries 14 marks and have an internal choice of Questions.

2. All parts of Question must be answered in one place.

BL – Blooms Level

CO – Course Outcome

			BL	CO	Max. Marks
UNIT-I					
1	a)	Explain about image sampling and Quantization.	L2	CO1	7 M
	b)	Explain the fundamental steps in digital image processing.	L2	CO1	7 M
OR					
2	a)	Find the shortest m connected path in the image segment given below for $V=\{1,2\}$ between the points p & q. <div style="text-align: center;"> 1 2 3 2 2 2 (q) 4 3 3 2 3 6 1 5 1 6 1 2 1 1 3 3 2 2 (p) 1 1 0 0 1 1 </div>	L3	CO4	7 M
	b)	Explain resolution concept in detail.	L2	CO1	7 M

UNIT-II																																
3	Illustrate the concept of image sharpening in both spatial and frequency domains.				L3	CO2	14 M																									
OR																																
4	a)	Explain about image smoothing using Ideal low pass filter.			L2	CO1	7 M																									
	b)	Demonstrate the local histogram processing with an example.			L3	CO3	7 M																									
UNIT-III																																
5	a)	Differentiate lossy & lossless predictive coding techniques.			L4	CO3	7 M																									
	b)	Explain image redundancies and removal methods.			L4	CO3	7 M																									
OR																																
6	a)	Name three reasons why it might be a good idea to compress files.			L2	CO1	7 M																									
	b)	<p>The following figure shows a 5×5 image with 5 different grey levels with values shown on the right figure.</p> <div style="display: flex; align-items: center;"> <div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 5px;">0.5</div> <div style="margin-bottom: 5px;">1</div> <div style="margin-bottom: 5px;">1.5</div> <div style="margin-bottom: 5px;">2</div> <div style="margin-bottom: 5px;">2.5</div> <div style="margin-bottom: 5px;">3</div> <div style="margin-bottom: 5px;">3.5</div> <div style="margin-bottom: 5px;">4</div> <div style="margin-bottom: 5px;">4.5</div> <div style="margin-bottom: 5px;">5</div> <div style="margin-bottom: 5px;">5.5</div> </div>  <div style="margin-left: 20px;"> <table style="border-collapse: collapse;"> <tr><td>180</td><td>160</td><td>160</td><td>140</td><td>120</td></tr> <tr><td>110</td><td>110</td><td>120</td><td>140</td><td>120</td></tr> <tr><td>110</td><td>140</td><td>120</td><td>120</td><td>140</td></tr> <tr><td>120</td><td>160</td><td>160</td><td>170</td><td>170</td></tr> <tr><td>170</td><td>120</td><td>110</td><td>140</td><td>110</td></tr> </table> </div> </div>			180	160	160	140	120	110	110	120	140	120	110	140	120	120	140	120	160	160	170	170	170	120	110	140	110	L3	CO2	7 M
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		Calculate the compression ratio and the coding redundancy using any one of the compression models.																														

UNIT-IV					
7	a)	Illustrate the segmentation in RGB vector space.	L3	CO4	7 M
	b)	Explain about region oriented segmentation.	L2	CO1	7 M
OR					
8	a)	Explain about Edge linking & boundary detection.	L4	CO3	7 M
	b)	How can you control Over segmentation problem? Explain it	L3	CO4	7 M
UNIT-V					
9	Explain about color fundamentals in image processing.		L2	CO1	14 M
OR					
10	Discuss about full color image processing.		L3	CO4	14 M