Hall Ticket Number:

Code No. : 17635 S (A)

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS), HYDERABAD
Accredited by NAAC with A++ Grade
B.E. (I.T.) VII-Semester Supplementary Examinations, July-2022
Digital Image Processing (PE-IV)

Time: **3 hours**   Max. Marks: **60**

*Note: Answer all questions from **Part-A** and any **FIVE** from **Part-B***

Part-A (10 × 2 = 20 Marks)

Q. No.	Stem of the question	M	L	CO	PO
1.	What is the resolution of a 1024x1024 image?	2	2	1	2
2.	What is quantization?.	2	1	1	2
3.	How the convolution in spatial domain can be represented in frequency domain?	2	1	2	1
4.	Give an example of 2D interpolation.	2	1	2	1
5.	What is the mask used for line detection in a digital image.	2	1	3	1
6.	Write the equation for gradient computation.	2	2	3	1
7.	How can a compressed image recovered back?	2	1	4	2
8.	What is meant by coding redundancy?	2	1	4	1
9.	List various applications of Morphology.	2	1	5	1
10.	What is Closing operation in Morphology? Give an example.	2	2	5	2

Part-B (5 × 8 = 40 Marks)

11. a)	Consider image segment shown here:	4	2	1	2

$$
\begin{array}{cccc}
3 & 1 & 2 & l(q) \\
2 & 2 & 0 & 2 \\
1 & 2 & 1 & 1 \\
(p)l & 0 & 1 & 2
\end{array}
$$

Let $V = \{0, 1\}$ and compute the lengths of shortest 4, 8 and m-path between p and q. if a particular path does not exist between p and q, explain why?

b)	Distinguish between digital image, and binary image. Give suitable example to each type of images.	4	2	1	2
12. a)	For the following 3 x 3 image find out the histogram equalization and draw the histogram.	4	4	2	2

Grey level	0	1	2	3	4	5	6	7
No of pixels	5	10	15	5	10	10	2	7

b)	Compare the characteristics of Low pass, High pass and Homomorphic filters in image enhancement in frequency domain	4	3	2	1

			M	L	CO	PO
13.	a)	Explain about Prewitt and Sobel edge Detectors	4	1	3	1
	b)	What are the derivative operators useful in image segmentation? Explain their role in segmentation	4	4	3	1
14.	a)	Design a code using LZW coding for the following string. 010010100001001010101001	4	4	4	2
	b)	Explain a method Wavelet Coding with examples	4	2	4	2
15.	a)	Explain Erosion and Dilation with examples	4	2	5	2
	b)	With a proper example explain HIT, MISS &FIT operations of Morphology.	4	1	5	1
16.	a)	Discuss about the Hadamard transforms (1-D & 2-D)	4	1	1	1
	b)	Compare the characteristics of Low pass, High pass and Homomorphic filters in image enhancement in frequency domain	4	2	1	2
17.		Answer any *two* of the following:				
	a)	Derive a Laplacian 3x3 kernel having non-zero weights to the diagonal elements.	4	3	3	1
	b)	Explain two techniques of region representation	4	2	4	1
	c)	How a boundary can be extracted using Morphological operations? With a proper example explain.	4	2	5	2

M : Marks;   L: Bloom's Taxonomy Level;   CO; Course Outcome;   PO: Programme Outcome

i)	Blooms Taxonomy Level – 1	24%
ii)	Blooms Taxonomy Level – 2	43%
iii)	Blooms Taxonomy Level – 3 & 4	33%

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