VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS), HYDERABAD
Accredited by NAAC with A++ Grade

B.E. (E.C.E.) VII-Semester Main & Backlog Examinations, Dec.-23/Jan.-24

Digital Image and Video Processing (PE-III)

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/PSO
1.	What is Euclidean distance and how do you measure.	2	1	4	1/3
2.	Give the representation of a digital image.	2	1	1	1/3
3.	Define the Fourier transform of the image f(x,y).	2	1	2	1/3
4.	Discuss the importance of the Slant Transform.	2	2	2	1/3
5.	Define histogram of an image.	2	1	3	1/3
6.	Draw the image degradation model.	2	1	3	1/3
7.	Give the generalized image compression model.	2	1	3	1/3
8.	Define the term "edge" and what are different techniques to detect edges in images.	2	1	4	1/3
9.	Write the generalized format of video signal.	2	1	1	1/3
10.	What do you mean by JPEG?	2	2	5	1/3

Part-B (5 × 8 = 40 Marks)

11. a)	How do you digitize an image? Give basic relations between pixels of an image.	4	2	1	1/3
b)	Write a detailed account of m-adjacency.	4	3	1	1/3
12. a)	Generate the Hadamard transform basis for N=4.	4	4	2	2/3
b)	Compute the DCT matrix for N=2 ; $A = \begin{bmatrix} 20 & 20 \\ 12 & 12 \end{bmatrix}$	4	4	2	2/3
13. a)	Write an account of histogram equalization process.	4	2	3	1/3
b)	Why we need inverse filtering? Discuss in detail.	4	3	3	1/3
14. a)	Explore different redundancies in images.	4	1	1	1/3
b)	How do you measure the quality of segmented and restored images? Discuss.	4	3	4	2/3

			M	L	CO	PO
15.	a)	Why motion estimation is crucial? Discuss at least one motion estimation model.	4	3	5	2/3
	b)	Design the flow diagram for fingerprint image enhancement.	4	4	5	3/3
16.	a)	Compare different distance measures.	4	3	4	4/3
	b)	Write an account of wavelet transform.	4	2	2	2/3
17.		Answer any *two* of the following:				
	a)	Compress the below matrix using lossless prediction (west pixel as predictor). If the west pixel is not available consider as zero. $$\begin{bmatrix} 20 & 22 & 24 \\ 28 & 32 & 40 \\ 26 & 36 & 38 \end{bmatrix}$$ Illustrate decompression process also.	4	3	3	2/3
	b)	Consider the initial threshold is 10. Compute the global threshold value to segment the below image into two parts $$\begin{bmatrix} 02 & 04 & 06 & 08 \\ 10 & 12 & 14 & 16 \\ 20 & 22 & 24 & 28 \\ 28 & 20 & 25 & 24 \end{bmatrix}$$	4	3	5	2/3
	c)	Discuss about object tracking in videos.	4	3	5	1/3

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

i)	Blooms Taxonomy Level – 1	20%
ii)	Blooms Taxonomy Level – 2	35%
iii)	Blooms Taxonomy Level – 3 & 4	45%

*****