Sl. No.

B3.E6-R5 : DIGITAL IMAGE PROCESSING AND COMPUTER VISION

NOTE :
1. Answer question 1 and any FOUR questions from 2 to 7.
2. Parts of the same question should be answered together and in the same sequence.

Total Time : 3 Hours **Total Marks : 100**

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1. (a) What are immersive and Non immersive Virtual Reality ?

(b) Define the following term : Bit depth, Resolution, Horizontal resolution and Vertical resolution.

(c) Explain the Mach band effect.

(d) Describe the point and neighborhood processing.

(e) What do you understand by global and local thresholding ?

(f) Explain the need of image fusion.

(g) Describe the role of λ In a Constraint least square filter. **(7x4)**

2. (a) What do you understand by lower level processing and higher level processing ? What are their significance ?

(b) Explain the role of Human visual system in Image processing.

(c) Compute the path length using 4, 8 and m-adjancy between p and q for V={0,1} for the given image.

3		1	2	1(q)
2		2	0	2
1		2	1	1
1(p)		0	1	2

(6+6+6)

3. (a) What are the different possible ways of representing a digital image and enlist the type of images.

(b) Analyze and compare the output of Min, Max and Median filter of the given image.

1	4	0	1	3	1
2	2	4	2	2	3
1	0	1	0	1	0
1	3	1	0	2	2
2	5	3	1	2	5
1	1	4	2	3	0

(c) Let p and q be the pixels at coordinates (10, 15) & (15, 25) respectively. Find out which distance measure gives the minimum distance between pixels ?

(6+6+6)

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4. (a) How the Homomorphic filter helps for improving the appearance of image ?

(b) Enlist in detail about the restoration filter when the image is degraded due to noise.

(c) Suppose that a 3-bit image (L=8) has the intensity distribution shown in following table. What would be the new enhanced transformed image after the histogram equalization process ?

Intensity	0	1	2	3	4	5	6	7
Number of pixels	70	100	40	80	60	40	08	02

(6+4+8)

5. (a) Encode the message "ABBABAS" using the LZW algorithm.

(b) How do we classify the image compression algorithm on the basis of coding ?

(c) For an 8 x 8 image given in following figure, implement image segmentation using region splitting technique and consider the threshold value less than equal to 1.

1	1	1	1	1	1	1	2
1	1	1	1	1	1	1	0
3	1	4	9	9	8	1	0
1	1	8	8	8	4	1	0
1	1	6	6	6	3	1	0
1	1	5	6	6	3	1	0
1	1	5	6	6	2	1	0
1	1	1	1	1	1	0	0

(6+5+7)

6. (a) For image mapping, what type of features and techniques are used in between related pair of image ? Explore in detail.

(b) Write the basic geometric transformation matrices of an image which helps us to extract the features.

(c) What do you understand by Histogram thresholding ? Explain it with an example.

(d) What are additive and subtractive color model ?

(6+3+3+6)

7. (a) How the correlation helps to identify the location of an object in an image ?

(b) Explain the sliding window and Bounding Box method.

(c) Enlist the features supported by Augmented Reality for the formation to build the model.

(d) Explain in detail about the component to build the block of Virtual Reality.

(5+5+4+4)

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