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Total Marks: 70

GANPAT UNIVERSITY

B. TECH SEM. VII (COMPUTER ENGINEERING / INFORMATION TECHNOLOGY) REGULAR EXAMINATION NOV/DEC - 2012 CE703 / IT703 : IMAGE PROCESSING

Total Time: 3 hours

page 2. Let V={0,1,2}. (b) What is false countering? what is the reason for it? (c) Discuss the order statistic filters. OR Q-1 (a) Explain all kinds of distance measures with examples. (b) Discuss any one application of image subtraction in brief. (c) Explain any two piece-wise linear transformation in detail. Q-2 (a) Find the Average Intensity and Intensity Variance using the histogram statistics for the image given in fig. (b) on page 2. (b) Discuss various masks based on first order derivative for sharpening the image. OR Q-2 (a) Consider the histogram values given below; for the 50 x 50, 3-bit image: \[\begin{array}{c c c c c c c c c c c c c c c c c c c										Iviai Ks.	
3. Assume suitable data wherever necessary. SECTION - I Q - 1 (a) Find the shortest 4-path, 8-path and m-path between P and Q in the image given in fig. (a) on page 2. Let V={0,1,2}. (b) What is false countering? what is the reason for it? (c) Discuss the order statistic filters. OR Q - 1 (a) Explain all kinds of distance measures with examples. (b) Discuss any one application of image subtraction in brief. (c) Explain any two piece-wise linear transformation in detail. Q - 2 (a) Find the Average Intensity and Intensity Variance using the histogram statistics for the image given in fig. (b) on page 2. (b) Discuss various masks based on historder derivative for sharpening the image. OR Q - 2 (a) Consider the histogram values given below, for the 50 x 50, 3-bit image: For the above image, achieve following histogram specification. Zq 0 1 2 3 4 5 6 7 n _k 280 190 580 125 465 182 513 165 For the above image, achieve following histogram specification. Zq 0 1 1 2 3 4 5 6 7 p ₁ (z _q) 0 0 0 0 0 0.19 0.27 0.28 0.26 (b) Explain the log transformation and power-law transformation in detail. Q - 3 (a) Differentiate among computer graphics, image processing, image analysis and computer vision. (b) Discuss the steps to apply the filter in frequency domain.	astructio										
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SECTION-II

Q-4 (a) What is convex hull? State the procedure to derive convex hull. Find the convex hull for the [8] image given in fig. (c) on page 2. State and explain the characteristics of the opening and closing. [4] Q-4 (a) Extract the connected components for the image given in figure (d). 'S' indicates the starting [6] point of the process. Discuss the thinning morphological operation in detail. [6] 0 - 5(a)Derive the LoG operator. Discuss the entire Marr - Hildrath edge detection algorithm. [6] What is thresholding? Discuss the basic global thresholding algorithm. [5] Q-5 (a) Explain the Otsu's method for thresholding in detail. [6] Why smoothing is applied to image before finding the edges of the image? 121 Discuss the DoG operator. [3] Q-6 (a) Explain the freeman chain codes for representation. How it can be normalized? [6] (b) Discuss the merging technique for representation. [2] (c) Prove the duality property for the erosion and dilation operations. [2] (d) Explain why two different thresholds are required in Canny's edge detection algorithm. [2] (Q) 1 0 2 3 0 1 7 6 2 0 5 (P) 1

END OF PAPER

Fig. (c)

Fig. (d)

Fig. (b)

Fig. (a)