Exam No: _____

GANPAT UNIVERSITY

B. TECH SEM-VIII (BM&I) REGULAR EXAMINATION– April - June 2015

2BM801: Biological Digital Image Processing

MAX. TIME: 3 HRS MAX. MARKS: 70

Instructions: (1) This Question paper has two sections. Attempt each section in separate answer book.
(2) Figures on right indicate marks.
(3) Be precise and to the point in answering the descriptive questions.
(4) Assume suitable data if necessary.
(5) wherever it is necessary explain with the help of diagram

SECTION – I

Q.1 **12**

(a) With diagram define the point, neighborhood and global processing. [3]

(b) What is spatial domain and frequency domain image enhancement? Explain the contrast stretching technique with example. [4]

(c) With diagram explain the structure of the eye with diagram. Give the function of cones and rods? [5]

OR

Q.1. **12**

(a) Draw the block dia. of image acquisition system and explain the function of the Optical system, sensor, addressing logic and timing circuit. [5]

(b) Why Gray level slicing technique is used? Explain the Gray level slicing technique. [4]

(c) Give the various formats used to store the digital image with their full name and extension. [3]

Q.2. **11**

(a) What is Histogram of an image? What information we obtained from image histogram. [3]

(b) How image subtraction enhancement is different than other type of enhancement? Explain image subtraction with example. [5]

(c) Write the equation of log transformation. Explain the use of it. [3]

Q.2. **OR** **11**

(a) Derive the equation of histogram equalization. [5]

(b) List the name of linear and nonlinear filters. Explain the smoothing linear filter with mask. [4]

(c) Give the application of smoothing spatial domain filter. [2]

Q.3. **Write short note on following** **12**

(a) Enlist the types of redundancy in an image. Explain any one of them. [4]

(b) What is principle objective of sharpening filter? Develop the mask of laplacian filter for image sharpening. [4]

(c) Explain various Edge operators in detail [4]

SECTION-II

Q.4.			12
	(a)	What is the use of Gradient and Laplacian operator? Give the demerits of laplacian operator? What are the fundamental difficulties in region growing?	[3]
	(b)	Define Digital image and Calculate the no. of bits required to store RGB image having no. of pixels of 512*512.	[3]
	(c)	How image restoration technique differs from image enhancement? Draw and explain the basic degradation model of image restoration.	[3]
	(d)	Adaptive filter gives better result compared to arithmetic Filters. Justify the above statement with suitable example.	[3]

OR

Q.4.			12
	(a)	Explain adaptive local noise reduction filter and Alpha trimmed mean filter with suitable example.	[6]
	(b)	Calculate the no. of bits required to store Binary image having no. of pixels 128*128. Give the Applications of Digital Image Processing.	[5]
	(c)	What is the advantage of Weiner Filter over Inverse filter?	[1]
Q.5.			11
	(a)	Define Spatial transformation and explain the technique of grey level interpolation with example.	[4]
	(b)	Define Saturation and Hue and explain any 2 techniques of Pseudo color image processing.	[5]
	(c)	Define Point and Edge related to image segmentation.	[2]

OR

Q.5			11
	(a)	Define Tie Points and find out the location of tie points when the image is rotated by 125^{o}	[4]
	(b)	Mention the Properties of image opening and closing operation. Write the steps to obtain skeletonization of image.	[5]
	(c)	Differentiate between global and local thresholding.	[2]
Q.6.		**Write short note on following**	12
	(a)	Noise models	[4]
	(b)	Dilation and Erosion of the images	[4]
	(c)	Region growing and Region merging	[4]

---------- END OF PAPER ----------