Student Exam No._____

GANPAT UNIVERSITY

B. Tech. Semester: VIII Biomedical & Instrumentation Engineering

Regular Examination May/June 2014

2BM801 Biological Digital Image Processing

Time: 3 Hours **Total Marks: 70**

Instruction:
1. Write each section in separate answer books.
2. All questions are compulsory.
3. Draw figures and assume data wherever necessary.
4. Conventional terms / notations are used.
5. Figure to the right indicates full marks.

SECTION - I

Que. – 1 **12**

(a) How image enhancement is non specific technique? Write the condition to be corrected by contrast stretching technique. Explain contrast stretching technique with example.

(b) With diagram give the distribution of light receptor on the surface of retina. Explain all the light receptors in detail.

OR

Que. – 1 **12**

(a) What is the aim of histogram equalization? Write the condition to be satisfied by histogram equalization transformation function and also derive the histogram equalization equation.

(b) What do you mean by spatial domain and frequency domain enhancement? With diagram explain the point, neighborhood and global processing.

Que. – 2 **11**

(a) Give the application of smoothing filter. With the mask explain the smoothing linear filter.

(b) What do you mean by image compression? Explain the broad categories of image compression techniques.

OR

Que. – 2 **11**

(a) Discuss the complete mechanism of spatial filtering and derive the equation for linear filtering response and convolution equation.

(b) For image restoration explain with diagram and mathematical expression all the noise PDF.

Que. – 3 **12**

(a) What do you mean by image negative? For which type of image this method is useful.

(b) For image display system explain the function of serializer, palette, addressing logic and timing circuit.

(c) Define the digital image and give the digital image properties.

SECTION – II

Que. – 4 12

(a) What is Image Smoothing? Explain Frequency domain Smoothing Filters and their applications in Detail.

(b) How frequency domain filtering is different from spatial domain filtering? Explain basic steps for filtering in frequency domain.

OR

Que. – 4 12

(a) Explain UnsharpMasking, Highboost filtering and high frequency emphasis filtering with its applications.

(b) Explain different color transformations to improve quality of a color image.

Que. – 5 11

(a) Explain Homomorphic filtering and discuss its applications.

(b) Define Gradient operator. Explain different gradient operators used for edge detection in detail

OR

Que. – 5 11

(a) Define thresholding. Discuss various types of Thresholding. Explain basic Algorithm used for Global thresholding.

(b) Explain Region growing and splitting approach for segmentation.

Que. – 6 12

(a) Define morphological image processing. Discuss Dilation and erosion operation with example.

(b) What is interpolation? Explain three different interpolation techniques in detail.

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