Seat No: _____

GANPAT UNIVERSITY.
B.TECH SEM. VII BIOMEDICAL & INSTRUMENTATION ENGINEERING
REGULAR EXAMINATION NOVEMBER/DECEMBER-2012
BME-702: BIOLOGICAL DIGITAL IMAGE PROCESSING

TIME: - 3 HOURS   TOTAL MARKS: - 70

INSTRUCTION: - 1. Write the answer of each section in separate answer sheet.
2. Figure to the right indicates full marks.
3. Assume suitable data if necessary.

SECTION-I   12

Que-1
- (a) What is gray level Re-mapping? When it is used? Explain image Rearranging with example.
- (b) Give the difference between histogram and histogram equalization. Give the condition for histogram equalization transformation function. Also draw the histogram concentration when image is 1) Dark 2) Bright 3) Low contrast 4) High contrast.

OR   12

Que-1
- (a) Explain image subtraction with example in medical field. Give the problem associated with this technique and their remedial solution.
- (b) Why cones can resolve the fine detail and rods can give overall vision? With diagram give the distribution of these receptors on the surface of retina.

Que-2   11
- (a) What is the general approach of spatial filtering? Explain the complete mechanism of spatial domain filtering and derive the necessary equations.
- (b) What do you mean by edge, edge direction and edge magnitude? Explain the Prewitt and Sobel operators with their implementation.

OR   11

Que-2
- (a) Explain the Unsharp masking and High-boost filtering.
- (b) Give the working principle of zero crossing of second order derivative for edge detection. Explain LOG and derive the equation of mask.   12

Que-3
- (a) Enlist the fundamental steps in image processing. Explain each step in detail.
- (b) Define image segmentation. Explain all types of intensity based image segmentation techniques.
- (c) What do you mean by image compression? Explain the fundamentals of image compression with types of compression techniques.

SECTION-II

Que-4
   (a) Explain Hit or Miss transform.
   (b) Explain 3D image translation and rotation with suitable equations.   **12**

OR

Que-4
   (a) Explain gray scale morphology for non-flat Structuring Element   **12**
   (b) Explain wiener filter with suitable derivation

Que-5
   (a) Explain block diagram of frequency domain filtering   **11**
   (b) Explain types of noise models

OR

Que-5
   (a) Explain estimation of Degradation of image by modeling method.   **11**
   (b) Explain color intensity slicing

Que-6
   (a) Explain different color models and their applications Also explain   **12**
       different displays
   (b) Explain all neighborhood pixel relationship with necessary
       conditions
   (c) Draw and explain different transfer function for lowpass filter in frequency
       domain

END OF PAPER