GANPAT UNIVERSITY
B. TECH SEMESTER - VII (CE/IT)
REGULAR EXAMINATION NOV – DEC 2015
2CE704 / 2IT704: FUNDAMENTALS OF IMAGE PROCESSING

Time: 3 hours   Total Marks: 70

Instructions: 1. Write each section in separate answer sheet.
2. Figure to the right indicates full marks.
3. Assume suitable data wherever necessary.

SECTION – I

Q – 1 (a) What is digital image processing? List out various fields in which digital image processing   [6]
is used. Explain any two with proper example.

(b) Explain the following terms: [6]
   i) Adjacency   ii) connectivity   iii) gray-level resolution

OR

Q – 1 (a) Compute length of the shortest 4-path, 8-path and m-path between P to Q for the given   [6]
image. Let V = {0, 1}. If more than one path exists (4, 8 or m-path), show it.

```
            3   1   2   1  (Q)
            2   2   0   2
            1   2   1   1
      (P)   1   0   1   2
```

(b) Explain Components of Image processing system.   [6]

Q – 2 (a) Perform equalization the following histogram for 64 x 64 image: [6]

r_k	0	1	2	3	4	5	6	7
n_k	790	1023	850	656	329	245	122	81

(b) Discuss linear and non-linear filters with appropriate example.   [5]

OR

Q – 2 (a) Explain the following image enhancement techniques and highlighting their area of   [6]
applications:
   1. Bit-plane slicing
   2. Gamma transformation

(b) What is histogram matching? Explain the development and implementation of the method   [5]
using example.

Q – 3 (a) Explain zooming and shrinking in digital images, how it takes place?   [6]
(b) Explain Image Subtraction with example.   [4]
(c) Explain how DIP is used in X-Ray imaging?   [2]