C7-R4: DIGITAL IMAGE PROCESSING & COMPUTER VISION

NOTE:

> 1. **Answer question 1 and any FOUR from questions 2 to 7.**
> 2. **Parts of the same question should be answered together and in the same sequence.**

Time: 3 Hours   **Total Marks: 100**

1.
a) Mention the difference between Monochrome and grayscale image.
b) What do you mean by Digitization of Image?
c) Discuss L2W scheme.
d) Define 4-adjacent, 8-adjacent with example.
e) Write the importance of Edge detection.
f) List any two properties of median filter.
g) What do you mean by Gaussian Noise?

                                                                               (7x4)

2.
a) Apply contrast stretching technique on 3 bit gray level image of size 4 x 4.

2	1	2	1
4	5	5	6
3	2	1	4
6	2	1	6

b) Explain High Boost filter and its usage.

                                                                               (9+9)

3.
a) Describe histogram equalization. Obtain Histogram equalization for the following image segment of size 5*5? Write the inference on image segment before and after equalization.

```
20    20    20    18    16
15    15    16    18    15
15    15    19    15    17
16    17    19    18    16
20    18    17    20    15      (5*5) matrix
```

b) Give names & functioning of various image sensing and acquisition devices.
c) Explain the LOG and DOG filters and its application areas.

                                                                             (9+5+4)

4.
a) Explain 1D Discrete Cosine Transform (DCT) and its usage in DIP.
b) With the help of block diagram explain Pseudo color Image Processing.

                                                                               (9+9)

5.
a) What are wavelet functions? Explain 2D-Haar wavelet transform.
b) List the techniques for detecting gray level discontinuities in digital image.
c) Explain Chain Coding and its usage.

(8+6+4)

6.
a) What is the need of error free compression? List the various coding techniques to achieve this.
b) How an image is compressed using JPEG image compression standard?

(10+8)

7. Write short notes on **(any three)**:
a) Object Recognition
b) Motion estimation
c) Image Segmentation
d) Hole filling

(6+6+6)