

(Time: 2 ½ Hours)

[Total Marks: 75]

N. B.: (1) All questions are compulsory.

(2) Make suitable assumptions wherever necessary and state the assumptions made.

(3) Answers to the same question must be written together.

(4) Numbers to the right indicate marks.

(5) Draw neat labelled diagrams wherever necessary.

(6) Use of Non-programmable calculators is allowed.

Q1. Attempt the three of the following.

15 Marks

- Explain the components of an Image Processing System in detail.
- Explain Image negative and Power law transformations with an example.
- What is mean by Histogram Equalization? Explain in detail.
- Explain the filters used for an image smoothening in spatial domain.
- Explain bit plane slicing in detail with an example.

Q2. Attempt the three of the following.

15 Marks

- Explain the 2D- Fourier transform function with an example.
- Explain the filters which are used for an image sharpening in the frequency domain.
- What are selective filtering? Explain the types of selective filters.
- Explain the types of noise models in detail.
- Explain the filters which are used for noise reduction of an image.

Q3. Attempt three of the following.

15 marks

- Explain the Rectangular arrays with an example.
- Explain the Discrete Hartley transform in detail.
- Explain Walsh - Hadamard transform with an example.
- What are various color models? Explain in detail.
- With an example explain Huffman coding.

Q4. Attempt three of the following.

15 marks

- Explain Erosion and Dilation of an image with an example.
- Explain the process of Thinning and Thickening with an example.
- Explain Prewitt and Sobel edge operators with an example.
- With neat sketch explain the Image Segmentation by Region Growing.
- Explain the image segmentation using Graph cuts in detail.

Q5. Attempt three of the following.

15 marks

- With a neat sketch explain Image segmentation using snakes.
- Explain the chain codes with an example.
- Explain Boundary Feature Descriptor with an example.
- With a neat sketch explain Topological Descriptors in detail.
- Explain the Harris – Stephens corner detector with an example.
