

(2½ Hours)

[Total Marks: 60]

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 labeled diagrams** wherever **necessary**.
- (6) Use of **Non-programmable** calculators is **allowed**.

Q1. Attempt the two of the following.

12 Marks

- a. Describe the fundamental Steps in Digital Image Processing in detail
- b. Explain the following Intensity Level Transformation:- Log transformations, Bit Plane Slicing
- c. Describe various methods of image sensing and acquisition.
- d. Explain in detail Image Sampling and Quantization.

Q2. Attempt the two of the following.

12 marks

- a. What are smoothing filters? Explain the Ideal low pass filter
- b. What are the different sources of noise?
- c. What are the basic steps of filtering in the frequency domain?
- d. Explain the model of image degradation and reconstruction with a diagram?

Q3. Attempt the two of the following.

12 marks

- a. Explain Slant Transforms and its properties
- b. Write short note on Haar Transform. Write its properties
- c. Explain the RGB Colour Model
- d. Explain the Huffman Coding with an example.

Q4. Attempt the two of the following.

12 marks

- a. Write a short note on Thinning
- b. Write a short note on Skeletonization
- c. Write a short note on Top-Hat and Bottom-Hat Transformations
- d. Write a short note on Convex hull and Hole filling

Q5. Attempt the two of the following.

12 marks

- a. Explain Harris-Stephens Corner detector algorithm.
- b. Explain Image Segmentation using Snakes
- c. Explain region descriptors in detail
- d. Explain with an example how Chain codes can be used to represent a boundary
