



- Notes :
1. All questions carry marks as indicated.
  2. Solve Question 1 OR Questions No. 2.
  3. Solve Question 3 OR Questions No. 4.
  4. Solve Question 5 OR Questions No. 6.
  5. Solve Question 7 OR Questions No. 8.
  6. Solve Question 9 OR Questions No. 10.
  7. Solve Question 11 OR Questions No. 12.
  8. Due credit will be given to neatness and adequate dimensions.
  9. Assume suitable data whenever necessary.
  10. Diagrams should be given whenever necessary.
  11. Illustrate your answers whenever necessary with the help of neat sketches.
  12. Use of non programmable calculator is permitted.

1. a) What are the elements of an image processing system? 7
- b) Explain about vidicon in detail with its operations. 7

**OR**

2. a) Explain the sampling and quantization process used for creating digital image. 5
- b) What is connectivity between pixels? Explain 4 and 8 connectivity. 5
- c) Explain the discrete cosine transform. 4
3. a) Explain histogram equalization and also write down its advantages. 5
- b) Write short note on median filtering along with properties of median filter. 4
- c) Discuss RGB color model in detail. 4

**OR**

4. a) Write a short notes on color image enhancement with diagram. 6
- b) Explain the concept of special filtering. 7
5. a) What is mean by unconstrained restoration? 3
- b) Write a short note on Gray level interpolation. 4
- c) Explain Wiener filtering with constraint restoration. Also write down its advantages & disadvantages? 7

**OR**

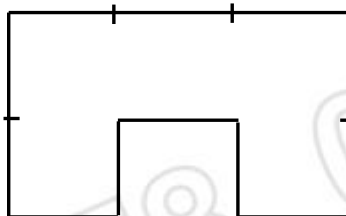
6. a) What do you mean by degradation? Give degradation process model for a continuous function giving relevant mathematical support? **7**
- b) Explain removal of blur caused by uniform linear motion. **7**
7. a) Explain the global process via the Hough transform. **8**
- b) Write a short note on region growing by pixel segmentation. **5**

**OR**

8. a) Explain the process of region splitting and merging. **3**
- b) Explain in detail with diagram Dam construction. **7**
- c) Explain the region based segmentation of digital images. **3**
9. a) Enlist the objective of image compression. **5**
- b) Design a binary Huffman code for a discrete source three independent symbols  $\alpha$ ,  $\beta$  &  $\gamma$  with probability 0.9 0.08 and 0.02 respectively, Determine:
- Entropy of source.
  - Average length of code.
  - Coding efficiency

**OR**

10. a) Write short notes on Run-length encoding. Also encode the following data  $\rightarrow 13\ 8\ 24\ 00027\ 4\ 0000\ 539$ . **6**
- b) Explain JPEG standard for image compression with help of diagram. **7**
11. a) Write a short note on topological descriptors. **6**
- b) What is order of the shape number for the figure shown below? Also obtain the shape number? **7**



**OR**

12. Write short notes on
- Graph matching. **6**
  - Tree search. **7**

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