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C022533(022)

B. Tech. (Fifth Semester) Examination Nov.-Dec. 2021

(Computer Science & Engg. Branch)

DIGITAL IMAGE PROCESSING

Time Allowed : Three hours

Maximum Marks : 100

Minimum Pass Marks : 35

Note : *Attempt all questions. Part (a) from each question is compulsory and answers any* ***two*** *of the remaining (b), (c) and (d).*

Unit-I

1. (a) What is the digital image processing? Listed the various elements of digital image processing. 4

(b) Explain image sampling and quantization. Also explain the effects of reducing sampling and quantization in digital image processing. 8

(c) Discuss about the fundamentals models of image formation. Explain image acquisition. 8

(d) Explain basic relationships between pixels (neighbours and connectivity). 8

Unit-II

2. (a) What do you mean by spatial filters smoothing and sharpening? 4

(b) What is the image restoration? Draw and explain the basic block diagram of the restoration process. 8

(c) Write short notes on : 8

(i) Histogram equalization

(ii) Histogram specification

(d) Differentiate between image enhancement and image restoration process. Mention some important causes of image degradation. 8

Unit-III

3. (a) What do you mean by dialation and erosion? 4

(b) What do you mean by image segmentation? What are various image segmentation techniques? Describe due image segmentation technique. 8

(c) What is morphological image processing? Explain edge linking and boundary detection in brief with proper example. 8

(d) Discuss the technique with example used for the following : 8

(i) Line detection

(ii) Edge detection

Unit-IV

4. (a) What is concept of descriptors and regional descriptors? 4

(b) What is image descriptors? Discuss various image classification techniques in detail. 8

(c) Explain the following boundary descriptors : 8

(i) Shape numbers

(ii) Texture

(iii) Feature extraction

(d) Write short notes on : 8

(i) Neural networks and

(ii) Deep learning

Unit-V

5. (a) What do you mean by run length coding? Define JPEG image. 4

   (b) Discuss about the principle of video compression with suitable examples. 8

   (c) What is the difference between lossy compression and lossless compression with example. 8

   (d) Write short note on : 8

   (i) Huffman coding and

   (ii) LZW coding