Code No.: IT734PE   R20   H.T.No. [ ][8][R][ ][ ][ ][ ]

CMR ENGINEERING COLLEGE: : HYDERABAD
UGC AUTONOMOUS
IV–B.TECH–I–Semester End Examinations (Regular) - November- 2024
IMAGE PROCESSING
(IT)

[Time: 3 Hours]   [Max. Marks: 70]

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 20 marks. Answer all questions in Part A.
Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART-A   (20 Marks)

1. a) What is sampling in digital signal processing? [2M]
   b) What is the process of converting a gray-level image into a binary image? [2M]
   c) How does a spatial filter like a smoothing filter affect an image? [2M]
   d) What is image smoothing, and which filters are commonly used for this purpose? [2M]
   e) What is the degradation model in image restoration? [2M]
   f) What are the limitations of inverse filtering in image restoration? [2M]
   g) What is the edge linking in image processing? [2M]
   h) What is region-oriented segmentation, and how does it differ from thresholding? [2M]
   i) What are some common methods for removing redundancies in image compression? [2M]
   j) What are some common techniques or algorithms used in lossy image compression? [2M]

PART-B   (50 Marks)

2. Analyze the role of 2D transformations like DFT, DCT, KLT, and SVD in digital image processing. [10M]

OR

3. Describe the steps involved in the digital image acquisition process through a scanner or digital camera. [10M]

4. Discuss the advantages and limitations of using histogram equalization for contrast enhancement in images. [10M]

OR

5. What is the difference between point processing and spatial filtering in image enhancement? [10M]

6. Explain the process of interactive image restoration and its significance in real-world applications. [10M]

OR

7. Explain the algebraic approach to image restoration and compare it with inverse filtering. [10M]

8. Explain the role of region-oriented segmentation in complex image analysis, and how it overcomes the limitations of edge detection methods. [10M]

OR

9. Explain the process of edge linking in boundary detection during image segmentation. [10M]

10. Analyze the impact of compression on image quality for multimedia applications, and discuss strategies to optimize the trade-off between file size and fidelity. [10M]

OR

11. Explain how image compression models are used to remove redundancies in digital images. [10M]

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