

Code No.: EC512PE

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H.T.No.

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CMR ENGINEERING COLLEGE: : HYDERABAD
UGC AUTONOMOUS

III-B.TECH-I-Semester End Examinations (Regular) - January- 2024
DIGITAL IMAGE AND VIDEO PROCESSING
(ECE)

[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.

PART-A

(20 Marks)

1. a) What are the fundamental steps of image processing? [2M]
- b) Explain about unitary image transform. [2M]
- c) Define point processing. [2M]
- d) What are the advantages of a Wiener filter over an inverse filter? [2M]
- e) What do you mean by image restoration? [2M]
- f) What is meant by image segmentation? Write its use in image processing. [2M]
- g) Outline the protocols used for streaming video. [2M]
- h) List the limitations of analog videos [2M]
- i) Define motion model. [2M]
- j) What Multi-Resolution Motion Estimation [2M]

PART-B

(50 Marks)

2. What is the need for image processing? Explain the various fundamental steps of digital image processing? [10M]

OR

3. a) Explain the following properties of 2D – DFT. [7M]
i. Translation ii. Separability
- b) What is the need of image transform? [3M]
4. a) Explain the mechanism of spatial domain filtering with suitable functions. [3M]
- b) Perform the histogram equalization for the 3-bit image [7M]

$$f(x,y) = \begin{bmatrix} 4 & 4 & 4 & 4 & 4 \\ 3 & 4 & 5 & 4 & 3 \\ 3 & 5 & 5 & 5 & 3 \\ 3 & 4 & 5 & 4 & 3 \\ 4 & 4 & 4 & 4 & 4 \end{bmatrix}$$

OR

5. Explain in detail about the Degradation model by using image restoration techniques and with neat sketch. [10M]
6. Explain in detail about region based segmentation methods. [10M]
Describe the gradient operators based edge detection with necessary equations and masks.

OR

7. Construct the Huffman coding table for the given message 'COMMITTEE'. and find its efficiency. [10M]

- 8.a) Explain about Photometric image formation. [5M]
b) How sampling is done for video signals. [5M]

OR

9. Differentiate the scene and object models in video processing. [10M]

10. Explain about the following terms

- a) Predictive coding [5M]
b) Block matching algorithms (BMA) [5M]

OR

- 11.a) Explain the applications of motion estimation in video coding with an example [5M]
b) Explain the Relation between Image Intensity and Motion [5M]
