Hall Ticket No | | | | | | | | | | | Question Paper Code: AECB57

INSTITUTE OF AERONAUTICAL ENGINEERING
(Autonomous)

B.Tech V Semester End Examinations (Regular), February – 2021

Regulation: IARE–R18

IMAGE PROCESSING

Time: 3 Hours **(CSE)** **Max Marks: 70**

Answer any Four Questions from Part A
Answer any Five Questions from Part B

PART – A

1. Differentiate between spatial resolution and gray level resolution. **[5M]**
2. List the properties of hotelling transform and explain the basic principle of hotelling transform. **[5M]**
3. Write about the image averaging process. Give its application. **[5M]**
4. Explain about region-based segmentation and relate it with the image segmentation. **[5M]**
5. Is Huffman code uniquely decodable? If so , justify your answer. **[5M]**
6. Explain the principle involved in sensing and acquisition of a digital image? **[5M]**
7. Describe a short note on Hadamard transform with one example. **[5M]**
8. Explain the operations contrast stretching and bit-plane slicing. **[5M]**

PART – B

9. Discuss in detail about the basic concepts involved in sampling and quantization of a digital image. **[10M]**
10. Explain binary image, gray-scale image and color image with an example and discuss the process of conversion of gray level image into binary image with an example. **[10M]**
11. Write about Walsh transform and list the properties of Walsh transform. State distributivity and scaling property. **[10M]**
12. Compute the 2D DFT of the 4×4 grayscale image given below. **[10M]**

$$F[m,n] = \begin{vmatrix} 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 \end{vmatrix}$$

13. Write about histogram of a digital image. Explain how histogram is useful in image enhancement? **[10M]**
14. Consider a grey-level image f (x, y) with histogram sketched in Figure 1.

    i) What can we say about f (x, y)?

    ii) Propose an intensity transformation function which will improve the contrast of the image when it is used to modify the intensity of the image.

    iii) Sketch the histogram of the transformed intensity.

    iv) Calculate the mean and the variance of the two images. **[10M]**

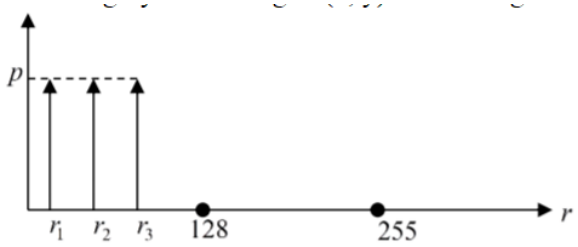

Figure 1

15. What is thresholding? Explain about global thresholding. **[10M]**

16. Discuss in detail about the detection of discontinuities in an image. **[10M]**

17. What is image compression? Explain about the redundancies in a digital image. **[10M]**

18. Describe in detail about image compression models. **[10M]**

– ○ ○ ◯ ○ ○ –