USN | | | | | | | | | | **21CS732**

Seventh Semester B.E./B.Tech. Degree Examination, Dec.2024/Jan.2025
Digital Image Processing

Time: 3 hrs.   Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1	a.	With a neat diagram, explain the fundamental steps in image processing.	**(10 Marks)**
	b.	Explain the components of an image processing system.	**(10 Marks)**

OR

2	a.	Explain the concept of sampling and quantization in image processing.	**(10 Marks)**
	b.	With a neat diagram of the eye, explain the human visual system working.	**(10 Marks)**

Module-2

3	a.	Explain piece-wise linear transformation functions.	**(10 Marks)**
	b.	Discuss the following frequency domain filters:	

     i)   Ideal HPF
     ii)   Butterworth HPF
     iii)   Gaussian high pass filters.   **(10 Marks)**

OR

4	a.	Explain the following:	

     i)   Image negatives
     ii)   Log transformations
     iii)   Power law transformations.   **(10 Marks)**

    b. Draw the block diagram of homomorphic filtering for image enhancement and explain it.
                                                                     (10 Marks)

Module-3

5	a.	Explain the basic model of image restoration process. Also with necessary equation the PDF's in an image processing.	**(10 Marks)**
	b.	With necessary mathematical equations explain inverse filtering and weiner filtering for image restoration.	**(10 Marks)**

OR

6	a.	What are three methods of estimating the degradation function? Explain each of the process.	**(10 Marks)**
	b.	Discuss adaptive median filtering method for image restoration. Also give its advantages.	**(10 Marks)**

Module-4

7	a.	Explain the procedure for converting from RGB to HSI and vice versa.	**(10 Marks)**
	b.	Explain erosion and dilation in image processing.	**(10 Marks)**

OR

8 a. Write a note on pseudo color image processing. **(10 Marks)**
  b. Explain opening and closing in image processing. **(10 Marks)**

Module-5

9 a. Explain Roberts operator and sobel operator. **(10 Marks)**
  b. Explain Laplacian of Gaussian operation (LOG) and difference of Gaussian filter. **(10 Marks)**

OR

10 a. Explain set theory operations like :
  i) Complement
  ii) Translators
  iii) Unions
  iv) Intersection
  v) Reflection. **(10 Marks)**

  b. Explain global thresholding algorithms of optimal otsu thresholding algorithms. **(10 Marks)**

* * * * *