B.E. (Elect. & Telecommunication / Elect. & Communication Engineering)
Eighth Semester (C.B.S.)

Elective - II : Digital Image Processing

P. Pages : 2 **NJR/KS/18/4703**

Time : Three Hours * 0 7 0 1 * Max. Marks : 80

Notes :
1. All questions carry marks as indicated.
2. Solve Question 1 OR Questions No. 2.
3. Solve Question 3 OR Questions No. 4.
4. Solve Question 5 OR Questions No. 6.
5. Solve Question 7 OR Questions No. 8.
6. Solve Question 9 OR Questions No. 10.
7. Solve Question 11 OR Questions No. 12.
8. Due credit will be given to neatness and adequate dimensions.
9. Assume suitable data whenever necessary.
10. Illustrate your answers whenever necessary with the help of neat sketches.
11. Use of non programmable calculator is permitted.

1. a) Explain the process of conversion of Analog to Digital image. **7**

b) Explain types of sensors used to image Acquisition. **7**

OR

2. a) Consider the image segments shown in figure. Compute the leyth of 4, 8 & m-path between 'p' and 'q' where V = {1, 2} & repeat for V = {2, 3} **8**

$$\begin{matrix} & \begin{bmatrix} 4 & 2 & 1 & 2 \\ 3 & 3 & 1 & 3 \\ 2 & 3 & 2 & 2 \\ 2 & 1 & 2 & 3 \end{bmatrix} \\ (p) & \end{matrix} \quad (q)$$

b) Explain Spatial & Grey level resolution in an image. **6**

3. a) Explain Basic Grey level transformation procedures of Image enhancement. **7**

b) Explain frequency domain smoothing filters used for enhancement of images. **7**

OR

4. a) Explain fundamentals of Color image processing. **5**

b) Grey level Histogram of an image is given below, **9**

Grey level	0	1	2	3	4	5	6	7
Frequency	400	700	1350	2500	3000	1500	550	0

compute grey level Histogram of output image by enhancing the i/p by histogram equalization technique.

5. a) Explain the properties of Fourier Transform. **6**

b) Explain the Hadamard transform. State & explain the properties of Hadamard transform. **7**

OR

6. a) Design a Haar transform for N = 8 & show that it is sequence ordered. **7**

b) Define a 4 x 4 slant transform. **6**

7. a) Explain image compression Model in detail. **10**

b) Explain fidelity criteria of image analysis. **3**

OR

8. a) The arithmetic decoding process is the reverse of the encoding procedure. Decode the message 0.23355, given the coding model, **8**

Symbol	Prob.
a	0.2
e	0.3
i	0.1
o	0.2
u	0.1
!	0.1

b) Write short note on Huffman coding. **5**

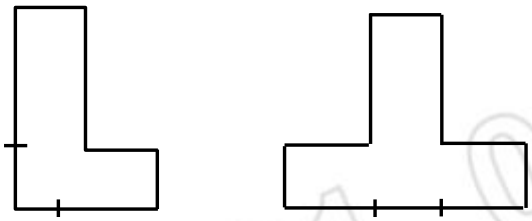
9. a) Explain Point, Line & Edge segmentation in detail. **7**

b) Using Hough Transform find a straight line. Given data points are (1, 1), (1, 5), (5, 5) & (5, 1) **6**

OR

10. a) Write short note on Polygonal approximations **5**

b) Find the chain codes and shape Numbers of the images given below. Also find the order of shape Numbers. Assume 4 – connectivity. **8**



(a) (b)

11. a) Explain image Degradation Model. **7**

b) Explain Noise Model in detail. **6**

OR

12. a) Explain Inverse filtering. **7**

b) Explain wiener filtering. **6**

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