U.S.N.										

B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

September / October 2023 Supplementary Examinations

Programme: B.E. **Semester: VI**
Branch: Medical Electronics **Duration: 3 hrs.**
Course Code: 19ML6PCMIP **Max Marks: 100**
Course: Medical Image Processing

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

UNIT - I

1 a) Compute the Euclidean distance D1, City-block distance D2 and chess board distance D3 for points p and q. Where p and q be(1,2,3) and (1,5,7) respectively. Give answer in the form (D1,D2,D3) **04**

b) Discuss the role of Image sampling and Quantization. **05**

c) Write the steps involved in converting colours from RGB to HIS and vice-versa. **06**

d) For V= {0,1} Find the length of shortest 4,8 and m path between p and q for the given image. **05**

3	1	2	1(q)
2	2	0	2
1	2	1	1
1(p)	0	1	2

UNIT - II

2 a) Illustrate the following gray level transformation **4x3=12**
(i)Log transformation (ii)Bit plane slicing (iii)Gray level slicing

b) What is image sharpening? How it is accomplished in spatial domain. **08**

OR

3 a) Perform histogram equalization of the following Image. Assume maximum intensity to be 7. **07**

3	3	5
4	4	3
5	2	2

b) Compute median value of the under lined pixels shown below using 3 x3 mask. **06**

18	22	33	25	32	24
34	**128**	**24**	**172**	**26**	33
22	19	32	31	28	26

c) Compute a matrix for Prewitt's and Sobel's operator with relevant derivation using gradient operator. **07**

UNIT - III

4 a) With relevant equations explain different smoothing frequency domain filter. **12**

b) Derive an expression for Homomorphic filtering. **08**

UNIT - IV

5 a) Identify suitable filter to reduce high density impulse noise in restoring original image. Discuss the process with suitable algorithm. **10**

b) List and explain different noise models with necessary equation and graph. **10**

UNIT - V

6 a) What is the principle of region based segmentation techniques? Explain any two types. **10**

b) Explain point and line detections with respect to detection of discontinuities. **10**

OR

7 a) What is thresholding? Explain basic local thresholding and global thresholding **10**

b) Explain the image representation and boundary descriptors. **10**

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