Reg.No.:												

VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN
[AUTONOMOUS INSTITUTION AFFILIATED TO ANNA UNIVERSITY, CHENNAI]
Elayampalayam – 637 205, Tiruchengode, Namakkal Dt., Tamil Nadu.

Question Paper Code: 120026

B.E. / B.Tech. DEGREE END-SEMESTER EXAMINATIONS – JAN. 2026
Sixth Semester
Biomedical Engineering
U19BM612 – MEDICAL IMAGE PROCESSING
(Regulation 2019)

Time: Three Hours | Maximum: 100 Marks

Answer ALL the questions

Knowledge Levels (KL)	K1 – Remembering	K3 – Applying	K5 - Evaluating
	K2 – Understanding	K4 – Analyzing	K6 - Creating

PART – A

(10 x 2 = 20 Marks)

Q.No.	Questions	Marks	KL	CO
1.	Define sampling and quantization.	2	K1	CO1
2.	List the steps involved in Digital Image Processing.	2	K1	CO1
3.	Mention the applications of image averaging.	2	K2	CO2
4.	Write the steps involved in frequency domain filtering.	2	K2	CO2
5.	Compare image enhancement and image restoration.	2	K2	CO3
6.	List the various noise models used in image restoration.	2	K1	CO3
7.	Discuss the need for image compression.	2	K2	CO4
8.	Discuss the principle of image compression by Huffman coding.	2	K1	CO4
9.	Discuss the process of erosion and dilation in morphological image processing.	2	K1	CO5
10.	Classify the types of image representations.	2	K2	CO5

PART – B

(5 x 13 = 65 Marks)

Q.No.		Questions	Marks	KL	CO
11.	a)	With a neat block diagram explain the functions of each element of digital image processing system.	13	K3	CO1

(OR)

	b)	Explain in detail about the RGB and HSI color models, and derive the relationship between them.	13	K3	CO1
12.	a)	Explain the various gray level transformations used for image enhancement.	13	K3	CO2
		(OR)			
	b)	What is histogram? Explain histogram equalization with example.	13	K3	CO2
13.	a)	Explain in detail about the singular value decomposition and specify its properties.	13	K2	CO3
		(OR)			
	b)	Draw the image degradation model and discuss various filtering used for image restoration in the presence of only noise.	13	K2	CO3
14.	a)	Distinguish between lossy and lossless compression and explain any one lossy compression technique.	13	K4	CO4
		(OR)			
	b)	Explain the schematics of image compression standard JPEG.	13	K3	CO4
15.	a)	Write short notes on:		K4	CO5
		i. Arithmetic coding.	7		
		ii. Block transform coding.	6		
		(OR)			
	b)	i. With a block diagram explain shift coding approach for image compression.	7	K4	CO5
		ii. Describe the stages in MPEG image compression standard.	6		

PART – C

(1 x 15 = 15 Marks)

Q.No.		Questions	Marks	KL	CO
16.	a)	Find the Huffman code, and average length of the code and its redundancy for the source emits letters from an alphabet A = {a1, a2, a3, a4, a5} with probabilities P(a1)==0.2, P(a2) = 0.4, P(a3) = 0.2, P(a4) = 0.1 and P(a5) = 0.1.	15	K4	CO5
		(OR)			
	b)	What are all the object recognition method used in image processing for decision making. How that methods apply in pattern classification?	15	K4	CO5