



Roll No:

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

BTECH
(SEM V) THEORY EXAMINATION 2024-25
IMAGE PROCESSING

TIME: 3 HRS

M.MARKS: 70

Note: Attempt all Sections. In case of any missing data; choose suitably.

SECTION A

1. Attempt all questions in brief.

2 x 07 = 14

Q no.	Question	CO	Level
a.	What is the RGB color model?	1	K1
b.	Define the 2D mathematical preliminaries in image processing?	1	K1
c.	Describe is the purpose of spatial filtering in image enhancement?	2	K2
d.	Define the image restoration in digital image processing?	3	K1
e.	Describe edge detection in image segmentation?	4	K1
f.	Define region-based segmentation?	4	K1
g.	Discuss the MPEG standard for video compression?	5	K2

SECTION B

2. Attempt any three of the following:

07 x 3 = 07

Q no.	Question	CO	Level
a.	Discuss the fundamentals of color images, including how color is represented digitally in RGB and HSI models.	1	K2
b.	Describe the Butterworth filter, and how is it used in image enhancement?	2	K2
c.	What is the purpose of notch filters in image restoration, and how are they used to eliminate periodic noise?	3	K2
d.	Describe the thresholding technique used in image segmentation and how it is used to separate objects from the background.	4	K2
e.	How does Run-Length Encoding (RLE) work in data compression?	5	K2

SECTION C

3. Attempt any one part of the following:

07 x 1 = 07

Q no.	Question	CO	Level
a.	Describe the steps involved in digital image processing and their importance in enhancing image quality.	1	K2
b.	What is the Discrete Fourier Transform (DFT), and how is it used to transform an image into the frequency domain for processing?	1	K2

4. Attempt any one part of the following:

07 x 1 = 07

Q no.	Question	CO	Level
a.	Discuss the differences between smoothing and sharpening spatial filters. Provide examples of when each is used.	2	K3
b.	Define homomorphic filtering, and how does it improve the quality of an image, particularly in terms of lighting and contrast?	2	K2



Roll No:

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

BTECH
(SEM V) THEORY EXAMINATION 2024-25
IMAGE PROCESSING

TIME: 3 HRS

M.MARKS: 70

5. Attempt any one part of the following: 07 x 1 = 07

Q no.	Question	CO	Level
a.	Describe Wiener filtering and how it is used to minimize noise in image restoration while preserving details.	3	K2
b.	What are the properties of image degradation that affect the restoration process, and how are these addressed?	3	K2

6. Attempt any one part of the following: 07 x 1 = 07

Q no.	Question	CO	Level
a.	What is morphological processing in image segmentation, and how are operations like erosion and dilation used to refine image features?	4	K2
b.	What is dam construction in watershed segmentation, and how does it help in controlling the flow of watersheds?	4	K2

7. Attempt any one part of the following: 07 x 1 = 07

Q no.	Question	CO	Level
a.	Discuss the JPEG standard for image compression, including its compression techniques and the types of images it is best suited for.	5	K2
b.	Explain the process of boundary description and how it helps in identifying object boundaries in image recognition.	5	K2