K. J. Somaiya Institute of Technology, Sion, Mumbai-22
(Autonomous College Affiliated to University of Mumbai)

July Aug ~~May - June~~ 2025
(B. Tech Program: _EXTC_Scheme II/IIB
~~Regular~~/Supplementary Examination: TY Semester: VI
Course Code: EXC603 and Course Name: Image Processing and Machine Vision
Date of Exam: 29/07/25 Duration: 02.5 Hours Max. Marks: 60

Instructions:
(1)All questions are compulsory.
(2)Draw neat diagrams wherever applicable.
(3)Assume suitable data, if necessary.

Q. No.	Question	Max. Marks	CO	BT level
Q 1	Solve any **two** questions out of three: (05 marks each)	10		
a)	What is sampling and quantization of an image? Explain with a neat diagram.		1	2
b)	What is piecewise linear transformation? When is it used?		2	2
c)	Explain how inverse filters are used for image restoration.		4	2
Q 2	Solve any **two** questions out of three: (05 marks each)	10		
a)	Apply Morphological operations, Opening and Closing on Segment A and Structuring element B given below: Segment A Structuring element B		3	3
b)	What is the confusion matrix and how is it evaluated? Explain the significance.		5	2
c)	Explain the Maximum Likelihood Classification. Give example.		6	2

Segment A

0	0	0	0	0
0	1	1	1	0
0	1	1	1	0
0	1	1	1	0
0	0	0	0	0

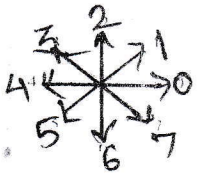
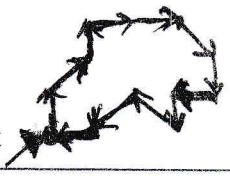
Structuring element B

0	1	0
1	1	1
0	1	0

Seat No.:

K. J. Somaiya Institute of Technology, Sion, Mumbai-22
(Autonomous College Affiliated to University of Mumbai)

July-Aug ~~May-June~~ 2025
(B. Tech Program: _EXTC_ Scheme II/IIB
~~Regular~~/Supplementary Examination: TY Semester: VI
Course Code: EXC603 and Course Name: Image Processing and Machine Vision
Date of Exam: ~~20/05/25~~ 29/07/25 Duration: 02.5 Hours Max. Marks: 60

Q.3	Solve any **two** questions out of three. (10 marks each)	20		
a)	Filter the following image using 3X3 neighborhood averaging, assume a) Zero Padding and b) Pixel Replication 1 3 2 3 4 5 2 2 1 6 3 2 2 4 6 7		3	3
b)	Explain the ideal low pass and high pass filter and its disadvantages.		2	2
c)	Explain the gradient filters in brief.		2	2
Q.4	Solve any **two** questions out of three. (10 marks each)	20		
a)	Find chain code using 8-way connectivity, also find 1st order difference. Circular 1st difference, Shape number and order for the figure given below:   starting point		5	3
b)	For the given image, apply a) Digital Negative b) Thresholding at T=4 c) Gray level slicing with and without background for given r1=3 and r2=5. d) Contrast Stretching for given r1= 3; r2= 5 and s1=2; s2=6. 4 2 5 3 2 2 6 5 3 5 4 5 7 5 4 2		2	2
c)	What is Support Vector Machine? Explain the SVM classifier.		6	2

****

Seat No.: