

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

May-June 2026

(B. Tech.) Program: Electronics and Telecommunication Scheme ~~HH/HB~~/III

Regular/Supplementary Examination: TY Semester: VI

Course Code: EXC 601 and Course Name: Image Processing and Machine Vision

Date of Exam: 18/5/26

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.		CO1	R,U																																																									
b)	Apply Sobel Filter to the given image. <table><tr><td>50</td><td>50</td><td>100</td><td>100</td></tr><tr><td>50</td><td>50</td><td>100</td><td>100</td></tr><tr><td>50</td><td>50</td><td>100</td><td>100</td></tr><tr><td>50</td><td>50</td><td>100</td><td>100</td></tr></table>		50	50	100	100	50	50	100	100	50	50	100	100	50	50	100	100	CO2	R,U, Apply																																									
50	50		100	100																																																									
50	50	100	100																																																										
50	50	100	100																																																										
50	50	100	100																																																										
c)	Perform Morphological operations, Opening and Closing on the given image, A and structuring element B. A = <table><tr><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>0</td><td>0</td><td>1</td><td>1</td><td>0</td><td>0</td><td>0</td></tr><tr><td>0</td><td>0</td><td>1</td><td>1</td><td>0</td><td>0</td><td>0</td></tr><tr><td>0</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>0</td></tr><tr><td>0</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>0</td></tr><tr><td>0</td><td>0</td><td>0</td><td>1</td><td>1</td><td>1</td><td>0</td></tr><tr><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr></table> B = <table><tr><td>0</td><td>1</td><td>0</td></tr><tr><td>1</td><td>1</td><td>1</td></tr><tr><td>0</td><td>1</td><td>0</td></tr></table>	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1	1	0	0	0	0	1	1	1	1	1	0	0	1	1	1	1	1	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	1	0	1	1	1	0	1	0	CO4	R,U, Apply
0	0	0	0	0	0	0																																																							
0	0	1	1	0	0	0																																																							
0	0	1	1	0	0	0																																																							
0	1	1	1	1	1	0																																																							
0	1	1	1	1	1	0																																																							
0	0	0	1	1	1	0																																																							
0	0	0	0	0	0	0																																																							
0	1	0																																																											
1	1	1																																																											
0	1	0																																																											
Q 2	Solve any two questions out of three: (05 marks each)	10																																																											
a)	Explain Hit-Miss Transform		CO3	R,U																																																									

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

May-June 2026

(B. Tech.) Program: Electronics and Telecommunication Scheme I/II/IIB/III

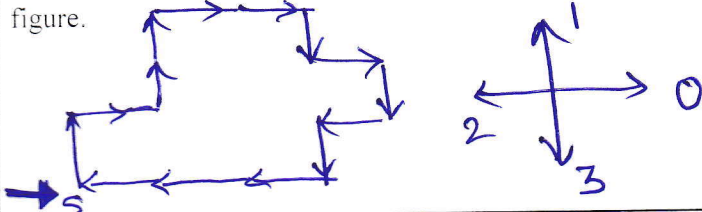
Regular/Supplementary Examination: TY Semester: VI

Course Code: EXC 601 and Course Name: Image Processing and Machine Vision

Date of Exam: 18/5/26

Duration: 02.5 Hours

Max. Marks: 60

b)	Find the chain code, First difference and order of the shape for the following figure. 		CO5	R,U, Apply																									
c)	Explain Supervised Classification with Example		CO6	R,U																									
Q.3	Solve any two questions out of three. (10 marks each)\	20																											
a)	Explain the noise models under image restoration		CO3	R,U																									
b)	For the given 3-bit image, apply i) Digital Negative ii) Log Transform iii) Power Law Transform iv) Thresholding with ($T_h = 4$) v) Bit Plane Slicing <table border="1"> <tr><td>4</td><td>2</td><td>5</td><td>1</td><td>1</td></tr> <tr><td>3</td><td>6</td><td>4</td><td>7</td><td>5</td></tr> <tr><td>2</td><td>1</td><td>6</td><td>5</td><td>4</td></tr> <tr><td>7</td><td>6</td><td>4</td><td>2</td><td>6</td></tr> <tr><td>6</td><td>2</td><td>4</td><td>5</td><td>1</td></tr> </table>	4	2	5	1	1	3	6	4	7	5	2	1	6	5	4	7	6	4	2	6	6	2	4	5	1		CO2	R,U, Apply
4	2	5	1	1																									
3	6	4	7	5																									
2	1	6	5	4																									
7	6	4	2	6																									
6	2	4	5	1																									
c)	Explain the Butterworth Low Pass and High Pass Filter.		CO2	R,U																									
Q.4	Solve any two questions out of three. (10 marks each)	20																											
a)	Discuss the Texture based classification for image description		CO5	R,U																									
b)	Plot the Histogram before and after equalization for the given Image <table border="1"> <tr><td>7</td><td>4</td><td>5</td><td>6</td><td>2</td></tr> <tr><td>5</td><td>6</td><td>4</td><td>7</td><td>5</td></tr> <tr><td>5</td><td>6</td><td>6</td><td>5</td><td>3</td></tr> <tr><td>7</td><td>6</td><td>5</td><td>2</td><td>6</td></tr> <tr><td>7</td><td>2</td><td>5</td><td>5</td><td>1</td></tr> </table>	7	4	5	6	2	5	6	4	7	5	5	6	6	5	3	7	6	5	2	6	7	2	5	5	1		CO2	R,U, Apply
7	4	5	6	2																									
5	6	4	7	5																									
5	6	6	5	3																									
7	6	5	2	6																									
7	2	5	5	1																									
c)	Explain the classification principle for machine learning algorithm		CO6	R,U																									
