

MANIPAL (A constituent unit of MAHE, Manipal)

## SIXTH SEMESTER BTECH DEGREE END SEMESTER EXAMINATION MAY 2022 SUBJECT: COMPUTER VISION (ECE -4051)

## **TIME: 3 HOURS**

MAX. MARKS: 50

## Instructions to candidates

- Answer **ALL** questions.
- Missing data may be suitably assumed.



						]	0	0	1 0	0]				
	$h = \begin{vmatrix} 0 & -1 & -2 & -1 & 0 \\ -1 & -2 & 16 & -2 & -1 \end{vmatrix}$													
	$\begin{bmatrix} 0 & -1 & -2 & -1 & 0 \\ 0 & 0 & -1 & 0 & 0 \end{bmatrix}$													
	What type of filter is this IPE BPE or HPE? Justify your answer													
	what type of filter is this, LPF, BPF of HPF? Justify your answer.													
2C.	Explain the significance of the first and second order derivative in the thick and thin edge detection.													
	(4+3+3)													
	Compute the projective transformation matrix for the given correspondence.													
3A.	$(0,1) \qquad (1,1) \qquad (0,1) \qquad (2,1)$													
					H			/						
			(0,0)	(1,0)			(0,0)	(1,0)						
3B.	Use th	ne leas	st squa	re me	ethod	to dete	ermine	the ec	uation	of a line of best fit for the given				
	data.	1	0	0	1	2	1	6	]					
	x y	4	2	0	1	0	-1	-2						
3C.	List th	ne diff	erence	e betv	veen j	project	ive an	d affin	e transf	formation.				
										(4+3+3)				
	Perform Naïve Bayes classification for the given feature set and decision constraint.													
4A.	Note: Feature sets= S1 and S2 Decision Constraint (S13, S24).													
	5	S1 7	$\frac{Y}{2}$ N		S2 S21	Y 2	N 2							
		<b>5</b> 12	4 0		S22	2 4	2							
	5	513 ( 514 (	$\frac{3}{2}$		S23	33 19	1 5							
	Suppose the given sub-image has the following points in the image plane with following $\{(x,y),$													
4B.	(4,1), $(1,6)$ , $(2,5)$ , $(5,2)$ , $(6,3)$ and $(3,4)$ co-ordinates. Represents these points in the parameter space.													
4C.	Explain the procedure to derive the Blob's in scale invariant feature transform.													
	-		-							(4+3+3)				
	Perform K-means clustering for the given data distribution, with the centroid definition.													
5A.	$\begin{array}{ c c c } A1 & A2 \\ \hline C1 & 46 & 71 \\ \hline \end{array}$													
	C1 C2	8.2	2 10.7	1										
	C3	6.6	18.6	5										

A1		6.8	0.8	1.2	2.8	3.8	4.4	4.8	6.0		
A2		12.6	9.8	11.6	9.6	9.9	6.5	1.1	19.9		
Conside	er the	e given p	rojective m	atrix, calcu	late the car	mera centre	e.				
-9 2		3	1								
3	-9	6	1								
2	6	-10	1								
Write a note on Geometric transformation.											
									(4+3+3)		
	A1 A2 Conside -9 3 2 Write a	A1A2Consider the-923-926Write a note	A1 $6.8$ A2 $12.6$ Consider the given p $-9$ 2 $3$ $-9$ $6$ $2$ $6$ $-10$ Write a note on Georetic	A1 $6.8$ $0.8$ A2 $12.6$ $9.8$ Consider the given projective m $-9$ $2$ $3$ $-9$ $6$ $1$ $2$ $6$ $-10$ $1$ Write a note on Geometric trans	A1 $6.8$ $0.8$ $1.2$ A2 $12.6$ $9.8$ $11.6$ Consider the given projective matrix, calculation $-9$ $2$ $3$ $1$ $3$ $-9$ $6$ $2$ $6$ $-10$ $2$ $6$ $-10$ Write a note on Geometric transformation.	A1 $6.8$ $0.8$ $1.2$ $2.8$ A2 $12.6$ $9.8$ $11.6$ $9.6$ Consider the given projective matrix, calculate the car $-9$ $2$ $3$ $1$ $3$ $-9$ $6$ $1$ $2$ $6$ $-10$ $1$ Write a note on Geometric transformation.	A1 $6.8$ $0.8$ $1.2$ $2.8$ $3.8$ A2 $12.6$ $9.8$ $11.6$ $9.6$ $9.9$ Consider the given projective matrix, calculate the camera centre $-9$ $2$ $3$ $1$ $3$ $-9$ $6$ $1$ $2$ $6$ Write a note on Geometric transformation.	A1 $6.8$ $0.8$ $1.2$ $2.8$ $3.8$ $4.4$ A2 $12.6$ $9.8$ $11.6$ $9.6$ $9.9$ $6.5$ Consider the given projective matrix, calculate the camera centre. $-9$ $2$ $3$ $1$ $3$ $-9$ $6$ $1$ $2$ $6$ $1$ $2$ $6$ $1$ $2$ $6$ $1$ $2$ $6$ $1$ $2$ $6$ $1$ $2$ $6$ $1$ $2$ $6$ $1$ Write a note on Geometric transformation.	A1 $6.8$ $0.8$ $1.2$ $2.8$ $3.8$ $4.4$ $4.8$ A2 $12.6$ $9.8$ $11.6$ $9.6$ $9.9$ $6.5$ $1.1$ Consider the given projective matrix, calculate the camera centre. $-9$ $2$ $3$ $1$ $3$ $-9$ $6$ $1$ $2$ $6$ $1$ $2$ $6$ $1$ $2$ $6$ $1$ $2$ $6$ $1$ $2$ $6$ $1$ $2$ $6$ $1$ $2$ $6$ $1$ $2$ $6$ $1$ $2$ $6$ $1$ $2$ $6$ $1$ Write a note on Geometric transformation.		