

Note: Student will be required to attempt five questions in all. Question no. 1 is compulsory. In addition to compulsory question. Student will have to attempt four more questions selecting one question from each unit.

1. Attempt the followings : $8 \times 2 = 16$

- What is two stage recognition scheme?
- Define Contrast Stretching.
- Write any two Methods of removing 'salt and pepper' noise.
- What is the purpose of skeleton identification in image processing?
- Name three projection schemes used in 3D vision.
- How is bundle adjustment associated with 3D imaging?

6. (a) What do you mean by a 3D Vision? Explain the concept and mechanism of shape from shading using suitable diagrams. 10

- (b) Why is active range finding used in computer vision? 6

7. Write detailed notes on : $4 \times 4 = 16$

- (i) Projection schemes

- (ii) Point based representation

- (iii) Triangulation

- (iv) Layered motion

8. Write detailed notes on face recognition application development with special emphasis on eigen faces and active appearance using concepts learnt in computer vision and image processing techniques. 16

9. (a) Explain the techniques of background separation. How to know when there are no targets present or illumination variation with weather and time of day? 10

- (b) What are chamber templates? How are these associated with locating whole pedestrians? 6

(B) What is combining of view from multiple cameras called?

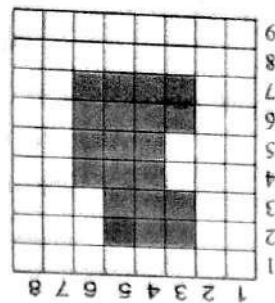
(h) How does road markings used in automatic vehicle driving system?

Unit - I

(a) What do you understand by connectedness in binary images? Explain the assumptions, the improved Labelling Algorithm and co-exists table used in it.

(b) Skeletonize using step by step diagrams on the image A using SE as shown in the diagram below.

6



$2 \times 4 = 8$

3. (a) Differentiate any two :
 (i) Thinning and Thinning
 (ii) Opening and Closing
 (iii) Erosion and Dilation

(b) What is co-occurrence matrix of an image? Write

co-occurrence matrix of the image below taking d

$(1, 0)$ and $d(1, \pi/2)$

8

0	0	0	1
1	1	1	1
2	2	2	3
3	3	4	5

Unit - II

4. (a) Discuss the need of (θ, p) form in Hough Transformation.

8

(b) Write some problems associated with circle detection. How can we overcome using HT based

circle object detection?

8

5. (a) Explain the terms line localization and line fitting along with their relationship.

8

(b) Are there any issues related to accurate centre detection of a circle? Explain how these can be overcome?

8