JAHANGIRNAGAR UNIVERSITY
Department of Computer Science and Engineering
PMSCS Program
Final Examination Fall-2021

Course Code: PMSCS-664 **Course Title:** Computer Vision
Total Marks: 30 **Time:** 1:30 hours

Answer any **Three (3)** of the following questions. Each questions carries equal marks.

1. a. What is Computer Vision? Write the contrast between computer vision and computer graphics. 3

b. Harris detector is which type of image feature detector? Write the mathematical properties of Harris detector. 3

c. Describe the Scale Invariant Feature Transform (SIFT) technique with necessary diagrams. 4

2. a. Why clustering is called unsupervised learning? Mention two main goals of a supervised learning process. 3

b. Define clustering technique. Draw and briefly explain the categorical explanation of clustering techniques. 3

c. What is meant by the K-means algorithm? Perform the hierarchical clustering using complete linkage algorithm for the following data samples. 4

	X	Y
1	4	4
2	8	4
3	15	8
4	24	4
5	24	12

3. a. Categorize and briefly explain the edge detection techniques. 4

b. Which factors are pre-defined for data augmentation technique? How does smart augmentation work with images? 3

c. Describe the Greylevel histogram-based image segmentation technique. 3

4. a. What is the multi-class confusion matrix? Find the *Accuracy*, *Sensitivity*, *Specificity*, *Precision*, *Recall* and *F1-score* for the following confusion matrix. 5

Class	+	-
+	85	7
-	18	9

b. Train a Perceptron to Perform Logical **OR** operation. Where, *w1=0.3, w2=-0.1, learning rate=0.1 and the threshold=0.2*. 5