Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

SIXTH SEMESTER B.TECH DEGREE EXAMINATION(R&S), MAY 2019

Course Code: CS362

Course Name: COMPUTER VISION

Max. Marks: 100 Duration: 3 Hours

PART A

Answer all questions, each carries3 marks. Marks

1		State different limitations of a pinhole camera and how to overcome these limitations. Write a short note on thin lenses.	(3)
2		What is BRDF? How are areas sources different from line sources?	(3)
3		Explain trifocal geometry with neat sketch.	(3)
4		What is meant by image rectification?	(3)

PART B

Answer any two full questions, each carries9 marks.

5	a)	Explain the different components of a vision system.	(3)
	b)	How is conversion from affine to euclidean images performed?	(3)
	c)	What are shadows? Differentiate umbra from penumbra.	(3)
6	a)	Explain Tomasi's and Kanade's factorization algorithm for affine shape from motion.	(5)
	b)	Compare weak perspective projection and orthographic projection in affine projection models.	(4)
7	a)	State any four limitations of thick lens.	(3)
	b)	Explain the different methods for solving the binocular fusion problem.	(6)

PART C

Answer all questions, each carries3 marks.

8		Explain the design cycle of a pattern recognition system.	(3)
9		How is supervised learning different from unsupervised learning. Explain with an example.	(3)
10		What is meant by a pose?	(3)
11		Explain the process of obtaining hypothesis using invariants.	(3)

PART D

Answer any two full questions, each carries9 marks.

12	a)	Write a short note on "Bayesian decision theory discrete feature" and "Bayesian	(6)

decision theory continuous feature". .

b) What could cause uncorrelated estimates of pose? How can this issue be handled? (3)

13 a) Define the following terms 1) state of nature 2) feature space 3) class conditional probability density function 4) prior probability. (4)

b) What is meant by pattern? Write a short note on pattern recognition system. (5)

14 a) Explain the algorithm for geometric hashing. (6)

b) Differentiate pose consistency and pose clustering. (3)

PART E

Answer any four full questions, each carries10 marks.

15 a) What are decision trees? Explain any algorithm to build a decision tree. (7)

b) Define Entropy and Gini-index with an example. (3)

16 a) What are linear discriminant based classifiers? Explain the Perceptron algorithm for classification. (6)

b) Explain Minimum Squared Error Method (MSE) for Classification. (4)

17 a) State the K-Means algorithm for clustering. (3)

b) Apply K-Means algorithm on the following data set to obtain three clusters: (1, 1), (1.5, 2), (3, 4), (5, 7), (3.5, 5), (4.5, 5) and (3.5, 4.5). (7)

18 a) What are distance measures? State any two properties of a similarity measure. Mention any two examples for dissimilarity measures, with equations. (4)

b) What is the importance of genetic algorithm in pattern classification? Explain with an example. (6)

19 a) Explain the use of neural network structures for pattern recognition with an example. (7)

b) Explain linear discriminant functions for single category and multi category. (3)

20 a) What are Support Vector Machines? Explain with an examples and neat illustrations and list out the advantages and disadvantages of SVM. (10)

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