Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

SIXTH SEMESTER B.TECH DEGREE EXAMINATION, APRIL 2018

Course Code: CS362

Course Name: COMPUTER VISION

Max. Marks: 100 Duration: 3 Hours

PART A

Answer all questions, each carries 3 marks. Marks

1		Explain "foreshortening" with a neat illustration.	(3)
2		What is meant by an "Epipolar Constraint"? How is it represented algebraically?	(3)
3		How is radiance different from irradiance? Explain.	(3)
4		What is Stereopsis? What are the two processes involved in it?	(3)

PART B

Answer any two full questions, each carries 9 marks.

5	a)	What is BRDF? State its properties.	(4)
	b)	State and explain the Marr-Poggio-Grimson multi-scale algorithm for establishing stereo correspondences.	(5)
6	a)	What is SVD? State the Tomasi's and Kanade's factorization algorithm for affine shape from motion.	(6)
	b)	Write a short note on shadows.	(3)
7	a)	Explain the Affine Structure from motion theorem, with a neat illustration.	(6)
	b)	State the binocular fusion problem.	(3)

PART C

Answer all questions, each carries 3 marks.

8		How is supervised learning different from unsupervised learning. Explain with an example.	(3)
9		What is classification? How is it different from clustering? Explain with an example.	(3)
10		Explain the algorithm for geometric hashing.	(3)
11		Why is the role of feature extraction in pattern recognition considered highly important? Explain with an example.	(3)

PART D

Answer any two full questions, each carries 9 marks.

12	a)	Explain the design cycle of a pattern recognition system.	(5)
	b)	Write a note on Bayesian Decision Theory.	(4)
13	a)	What is meant by a pose? How can you hypothesize a correspondence between a collection of image features and a collection of object features, using pose	(6)

consistency?

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

14 a) How is prior probability related to posterior probability? What role do they play in decision making? Explain with an example. (5)

b) Write short notes on univariate and multivariate densitiy. (4)

PART E

Answer any four full questions, each carries 10 marks.

15 a) Explain the various steps in developing a clustering task, with a proper example. (5)

b) What are proximity measures? State two properties of a dissimilarity measure. Mention any two examples for dissimilarity measures, with equations. (5)

16 a) What are the different types of features that could be used for clustering? (2)

b) How are genetic algorithms used for pattern classification? State the recent advances in the field. (4)

c) Mention the ways in which neural network structures can be used for pattern recognition. (4)

17 a) What are decision trees? Explain the ID3 algorithm for classification. (5)

b) Write a short note on Classification And Regression Trees (CART). Explain with an example. (5)

18 a) State the K-Means algorithm for clustering. Apply K-Means algorithm on the following data set to obtain two clusters: (1, 1), (1.5, 2), (3, 4), (5, 7), (3.5, 5), (4.5, 5) and (3.5, 4.5). (7)

b) What are similarity measures? State any 3 examples for distance functions that can be used as similarity measures. (3)

19 What are Support Vector Machines? Explain with examples and neat illustrations. (10)

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

b) How is the Minimum Mean Squared Error (MME) method used for classification? Explain with an example. (4)

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