Basavarajeswari Group of Institutions

2022 SCHEME

BALLARI INSTITUTE OF TECHNOLOGY & MANAGEMENT

(Autonomous Institute under Visvesvaraya Technological University, Belagavi)

USN | | | | | | | | | | |

Course Code | 2 | 2 | E | C | 6 | 3 | 4 |

Sixth Semester B.E. Degree Examinations, June/July 2025

COMPUTER VISION ALGORITHMS AND APPLICATIONS

Duration: 3 hrs **Max. Marks: 100**

Note: 1. Answer any* FIVE *full questions, choosing* ONE *full question from each module.
2. Missing data, if any, may be suitably assumed

Q. No		*Question*	*Marks*	*(RBTL:CO: PI)*
		Module-1		
1.	**a.**	What is computer vision? Why is vision so difficult? Provide six real-world examples of computer vision and explain.	**10**	**(2:1:1.3.1)**
	b.	With a neat diagram, explain the image sensing pipeline and its important effects.	**10**	**(2:1:1.3.1)**
		(OR)		
2.	**a.**	Explain 2D transformation with a neat diagram.	**05**	**(2:1:1.3.1)**
	b.	Explain in detail the Bidirectional Reflectance Distribution Function (BRDF).	**08**	**(2:1:1.3.1)**
	c.	Illustrate with a real-world example for pinhole perspective and explain its behaviour under various effects.	**07**	**(2:1:1.3.1)**
		Module-2		
3.	**a.**	Explain Fourier Transform. Justify its properties.	**10**	**(2:2:1.3.1)**
	b.	Write and explain the corner detector and laplacian of Gaussian algorithm.	**10**	**(2:2:1.3.1)**
		(OR)		
4.	**a.**	With illustration, discuss segmentation based on region splitting and merging.	**10**	**(2:2:1.3.1)**
	b.	Write an algorithm for Otsu's threshold detection method.	**10**	**(2:2:1.3.1)**
		Module-3		
5.	**a.**	Illustrate the decision making process in classification and regression using decision tree structure.	**10**	**(2:3:1.3.1)**
	b.	Describe the minimum error criteria used in classifiers using Baye's theorem and maximum likelihood.	**10**	**(2:3:1.3.1)**
		(OR)		
6.	**a.**	Discuss the two basic class classification problem using support vector machine.	**10**	**(2:3:1.3.1)**
	b.	Describe two main decision making tasks using random forest.	**10**	**(2:3:1.3.1)**
		Module-4		
7.	**a.**	Illustrate logistic and linear regression using necessary equations.	**10**	**(2:4:1.3.1)**
	b.	Discuss parametric and non-parametric machine learning models.	**10**	**(2:4:1.3.1)**

Note: (RBTL - Revised Bloom's Taxonomy Level: CO - Course Outcome: PI– Performance Indicator)

(OR)

8.	**a.**	Explain in detail non-parametric K-NN classifier.	**10**	**(2:4:1.3.1)**
	b.	Justify the need for probabilistic prediction in machine learning.	**10**	**(2:4:1.3.1)**

Module-5

9.	**a.**	Explain RNN and LSTM with relevant diagrams.	**10**	**(2:5:1.3.1)**
	b	Explain the concept of Kernel and Maxpooling. Also describe CNN structure.	**10**	**(2:5:1.3.1)**

(OR)

10.	**a.**	Discuss the regulation methods to avoid overfitting in ANN.	**10**	**(2:5:1.3.1)**
	b.	Explain one training algorithm and two optimization techniques used in ANN.	**10**	**(2:5:1.3.1)**

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