

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS INSTITUTION)

B. Tech III Year II Semester (R23) Regular End Semester Examinations, May – 2026**Computer Vision and Image Processing**

Minors in CSE (AI and ML)

Time: 3Hrs

Max Marks: 70

Attempt all the questions. All parts of the question must be answered in one place only.
All parts of Q.no 1 are compulsory. In Q.no 2 to 6 answer either A or B only

S.No.	Question	Marks	CO	BL
1.	i) Define Computer Vision.	1	1	1
	ii) Define stereo vision?	1	1	1
	iii) Define image transform.	1	2	1
	iv) Define image segmentation?	1	2	1
	v) Define edge detection?	1	3	1
	vi) Expand HOG.	1	3	1
	vii) Define clustering?	1	4	1
	viii) Expand LDA.	1	4	1
	ix) Define Artificial Neural Network	1	5	1
	x) Define an autoencoder?	1	5	1
2(A)	(i) Explain the fundamental concepts of image formation, including radiometry, geometric transformations, and geometric camera models.	12	1	2
OR				
2(B)	(i) Explain geometric camera models and their significance in computer vision.	6	1	2
	(ii) Describe camera calibration and stereo vision setup used in image reconstruction.	6	1	2
3(A)	(i) Explain various image transforms and image enhancement techniques used in digital image processing.	12	2	2
OR				
3(B)	(i) Explain image filtering methods used for noise removal and image improvement.	6	2	2
	(ii) Describe colour image processing and image segmentation techniques.	6	2	2
4(A)	(i) Explain texture descriptors, colour features, and object shape representations used in feature extraction.	12	3	2
OR				
4(B)	(i) Explain the working of interest point detectors and corner detection methods.	6	3	2
	(ii) Describe Histogram of Oriented Gradients (HOG) and Scale Invariant Feature Transform (SIFT).	6	3	2
5(A)	(i) Apply clustering and dimension reduction techniques including Linear Discriminant Analysis for data classification	12	4	3
OR				
5(B)	(i) Explain Linear Regression and its applications in machine learning.	6	4	2
	(ii) Describe the basic concepts of decision functions and statistical decision theory.	6	4	2
6(A)	(i) Apply gesture recognition, motion estimation, and object tracking techniques in real-world computer vision applications.	12	5	3
OR				
6(B)	(i) Explain the concept and applications of Autoencoders in computer vision.	6	5	2
	(ii) Describe the architecture and applications of Convolutional Neural Networks (CNNs).	6	5	2

END

Hall Ticket No:

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Question Paper Code: 23MDCSM1M05

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS INSTITUTION)

B. Tech III Year II Semester (R23) Regular End Semester Examinations, May - 2026**MINORS: DATA ANALYTICS WITH PYTHON**

(CSE - AI & ML)

Time: 3Hrs**Max Marks: 70**

Attempt all the questions. All parts of the question must be answered in one place only.

All parts of Q.no 1 are compulsory. In Q.no 2 to 6 answer either A or B only

S.No.	Question	Marks	CO	BL
1.	i) Name any one Python library used for data analysis.	1	1	1
	ii) Define sampling.	1	1	1
	iii) What is meant by p-value?	1	2	1
	iv) What is ANOVA?	1	2	1
	v) Define logistic regression.	1	3	1
	vi) What is predictive modeling?	1	3	1
	vii) What is cluster analysis?	1	4	1
	viii) What is Chi-Square test?	1	4	1
	ix) Expand CART.	1	5	1
	x) Define model evaluation.	1	5	1
2(A)	Explain the fundamentals of data analytics and its applications.	12	1	2
OR				
2(B)	Explain the basic concepts of probability with examples.	12	1	2
3(A)	Explain the steps involved in hypothesis testing.	12	2	2
OR				
3(B)	Discuss One-Way ANOVA with suitable examples.	12	2	2
4(A)	Explain linear regression and its applications in data analytics.	12	3	2
OR				
4(B)	Apply logistic regression and explain ROC analysis.	12	3	3
5(A)	Explain different clustering techniques used in data analytics.	12	4	2
OR				
5(B)	Describe distance and similarity measures in clustering.	12	4	2
6(A)	Apply the basic concepts of classification techniques.	12	5	3
OR				
6(B)	Explain predictive analytics workflow with an example.	12	5	2

*****END*****

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B. Tech III Year II Semester (R23) Regular End Semester Examinations, May – 2026**MINORS: NATURAL LANGUAGE PROCESSING**

(CSE - AI & ML)

Time: 3Hrs**Max Marks: 70**

Attempt all the questions. All parts of the question must be answered in one place only.
All parts of Q.no 1 are compulsory. In Q.no 2 to 6 answer either A or B only

S.No.	Question	Marks	CO	BL
1.	i) Define Natural Language Processing.	1	1	1
	ii) What are Empirical Laws in NLP?	1	1	1
	iii) Define Edit Distance.	1	1	1
	iv) What is a Language Model?	1	1	1
	v) What is POS Tagging?	1	2	1
	vi) Define Hidden Markov Model (HMM).	1	2	1
	vii) Define Parsing in NLP.	1	3	1
	viii) Define Word Embeddings.	1	4	1
	ix) What is Topic Modeling?	1	4	1
	x) Define Sentiment Analysis.	1	5	1
2(A)	Explain the basic text processing steps in NLP.	12	1	3
	OR			
2(B)	Describe spelling correction using Edit Distance and Weighted Edit Distance.	12	1	3
3(A)	Explain Hidden Markov Models for POS Tagging.	12	2	2
	OR			
3(B)	Discuss the Viterbi Decoding algorithm used in HMM.	12	3	2
4(A)	Explain Probabilistic Context Free Grammars (PCFGs).	12	3	2
	OR			
4(B)	Explain Distributional Semantics and its applications.	12	4	2
5(A)	Explain Text Classification techniques in NLP.	12	5	4
	OR			
5(B)	Discuss Summarization Evaluation methods.	12	5	2
6(A)	Implement the K-Means clustering algorithm step by step. Explain the objective function, convergence criteria, and K-Means++ initialization. Discuss the elbow method and silhouette analysis for choosing optimal K.	12	5	3
	OR			
6(B)	Explain hierarchical clustering methods including agglomerative and divisive approaches. Describe different linkage methods (single, complete, average, Ward's) and their properties. Interpret dendrograms for cluster analysis.	12	5	4

*****END*****