

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS INSTITUTION)

B. Tech III Year II Semester (R23) Regular End Semester Examinations, May – 2026**CRYPTOGRAPHY AND NETWORK SECURITY**

(Computer Science & Technology)

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. nos. 2 to 6, answer either A or B only.

S.No.	Question	Marks	CO	BL
1.	i) What are the two basic functions used in encryption algorithms?	1	1	1
	ii) List the four specific transformation functions used in a single round of AES.	1	1	1
	iii) Find gcd (1970, 1066) using Euclid's algorithm?	1	2	1
	iv) Compare the public and private keys.	1	2	1
	v) What do you mean by one-way property in a hash function?	1	3	1
	vi) Define Kerberos.	1	3	1
	vii) Why is the email compatibility function in PGP needed?	1	4	1
	viii) Differentiate transport and tunnel modes in IPsec.	1	4	1
	ix) State the default port numbers used by HTTPS and SSH.	1	5	1
	x) Define the term "Stateful Inspection" in the context of firewalls.	1	5	1
2(A)	Write a short note on the following substitution techniques: (i) Playfair Cipher (ii) Hill Cipher	12	1	2
OR				
2(B)	Explain the key generation, encryption and decryption of the DES algorithm in detail	12	1	2
3(A)	(i) Describe the RSA algorithm.	6	2	2
	(ii) Perform encryption and decryption using the RSA algorithm for the following: $p=7$, $q=11$, $e=7$, $M=9$.	6	2	3
OR				
3(B)	Illustrate the Diffie-Hellman Key Exchange process and show how a common key is established between two parties with an example.	12	2	3
4(A)	Illustrate the SHA algorithm and explain.	12	3	2
OR				
4(B)	Explain in detail about X.509 authentication services.	12	3	2
5(A)	Discuss transport mode and tunnel mode authentication in IPsec? Describe how ESP is applied to both these modes.	12	4	2
OR				
5(B)	Summarize the steps involved in securing email using S/MIME.	12	4	2
6(A)	Explain the steps and methodology of the SSL protocol.	12	5	2
OR				
6(B)	Explain the characteristics and types of firewalls	12	5	2

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MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS INSTITUTION)

B. Tech III Year II Semester (R23) Regular End Semester Examinations, May – 2026**INTRODUCTION TO MACHINE LEARNING**

(Computer Science & Technology)

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 Unsupervised learning algorithm.	1	1	1
	ii) List any two applications of machine learning in NLP.	1	1	1
	iii) Write the Bayes' theorem formula.	1	2	1
	iv) What is the L2 norm of vector $v = [3, 4]$?	1	2	1
	v) State Bayes Rule and any two significances in probability-based ML algorithms.	1	3	1
	vi) What is the purpose of backpropagation in neural networks?	1	3	1
	vii) What is a support vector in SVM?	1	4	1
	viii) Write any two common kernel functions used in SVM.	1	4	1
	ix) State the purpose of cross-validation in ensemble learning?	1	5	1
	x) List the role of bootstrap sampling in bagging.	1	5	1
2(A)	(i) Classify the different types of machine learning paradigms: Supervised, Unsupervised, Semi-supervised, Reinforcement. Provide two real-world applications for each type.	6	1	2
	(ii) Describe the concept of inner product, norms L1, L2, orthogonality of vectors in the context of distance metrics used in clustering algorithms.	6	1	2
OR				
2(B)	Explain the concept of hypothesis testing in machine learning. Describe how the hypothesis space is searched to find optimal models.	12	1	2
3(A)	(i) Apply the gradient descent algorithm and its variants. Explain how it optimizes the cost function iteratively to find optimal parameters.	6	2	3
	(ii) Explain logistic regression for binary classification. Derive the logistic function and analyze its properties for probability estimation.	6	2	2
OR				
3(B)	Demonstrate the underfitting and overfitting in neural networks and explain its techniques to mitigate these issues: regularization, early stopping.	12	2	3
4(A)	(i) Examine the least squares solution for linear regression and explain cost minimization.	6	3	4
	(ii) Differentiate batch, stochastic and mini-batch gradient descent and their merits and demerits.	6	3	4
OR				
4(B)	(i) Explain MLP architecture, forward and backpropagation, and the effect of Sigmoid, Tanh and ReLU activations on learning and bias-variance trade off.	12	3	2

5(A)	(i)	Demonstrate the linear kernel and explain when it is suitable.	6	4	3
	(ii)	Compare the sigmoid kernel with other kernels.	6	4	4

OR

5(B)		Apply hyperparameter tuning in SVM and discuss which parameters are typically tuned.	12	4	3
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6(A)	(i)	Classify the filter-based feature selection and wrapper-based feature selection methods for feature ranking.	6	5	2
	(ii)	Explain genetic algorithms and their application to optimization problems. And demonstrate how the chromosome representation and fitness evaluation is calculated.	6	5	3

OR

6(B)		Apply ensemble learning models. And discuss why ensembles often outperform individual models.	12	5	3
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MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS INSTITUTION)

B. Tech III Year II Semester (R23) Regular End Semester Examinations, May – 2026**CLOUD COMPUTING**

(Computer Science & Technology)

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 distributed system.	1	1	1
	ii) What role do Web 2.0 technologies play in cloud computing?	1	1	1
	iii) State the meaning of cloud elasticity.	1	2	1
	iv) What do you mean by Multitenancy?	1	2	1
	v) Specify the type of application best suited for the MapReduce model?	1	3	1
	vi) Name the component that manages the application execution lifecycle in Aneka?	1	3	1
	vii) Specify the service used for virtual machines in AWS.	1	4	1
	viii) Which cloud platform provides App Engine?	1	4	1
	ix) State the need of risk management?	1	5	1
	x) What is SLA violation?	1	5	1
2(A)	(i) Differentiate between tightly coupled and loosely coupled systems?	6	1	2
	(ii) Discuss the role of virtualization in enabling cloud computing environments.	6	1	2
OR				
2(B)	With neat sketch discuss Flynn's taxonomy (SISD, SIMD, MISD, MIMD) hardware architectures.	12	1	2
3(A)	(i) Discuss different cloud deployment models.	6	2	2
	(ii) Discuss the basic components of an IaaS-based solution for cloud computing?	6	2	2
OR				
3(B)	Differentiate Type 1 and Type 2 Hypervisors.	12	2	2
4(A)	(i) Explain the role of Platform Abstraction Layer (PAL) and its functions in supporting heterogeneous environments.	6	3	2
	(ii) With neat sketch explain the logical organization of Aneka cloud.	6	3	2
OR				
4(B)	(i) Discuss various high performance distributed file systems.	12	3	2
5(A)	(i) With neat diagram explain the Cloud solution for ECG monitoring system.	6	4	3
	(ii) Discuss the architecture of CRM developed by Salesforce.	6	4	2
OR				
5(B)	Describe Amazon EC2 and its basic features.	12	4	2
6(A)	A cloud system relies only on password-based authentication. Analyze the limitations and suggest improved security measures for the above scenario.	12	5	4
OR				
6(B)	A cloud application fails without any recovery mechanism in place. Assess the impact and suggest suitable recovery strategies for the above situation.	12	5	4

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Question Paper Code: 23CST402

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS INSTITUTION)

B. Tech III Year II Semester (R23) Regular End Semester Examinations, May – 2026**CYBER SECURITY**

(Computer Science & Technology)

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) What is information security?	1	1	1
	ii) What is cyber law?	1	1	1
	iii) What is social engineering?	1	2	1
	iv) What is impersonation in cybercrime?	1	2	1
	v) What is phishing in mobile devices?	1	3	1
	vi) What is meant by mobile computing?	1	3	1
	vii) What is a worm in cybersecurity?	1	4	1
	viii) What is a payload in malware?	1	4	1
	ix) What is copyright?	1	5	1
	x) What is social computing?	1	5	1
2(A)	Describe cybercrime issues from a legal perspective.	12	1	2
	OR			
2(B)	Explain the classification of cybercrimes.	12	1	2
3(A)	Analyze different social engineering techniques and their effectiveness.	12	2	4
	OR			
3(B)	Demonstrate how individuals can protect themselves from cyber stalking.	12	2	3
4(A)	Illustrate how organizations can handle mobile device security issues.	12	3	3
	OR			
4(B)	Apply security settings to protect mobile devices from threats.	12	3	3
5(A)	Differentiate between viruses, worms, and Trojan horses.	12	4	4
	OR			
5(B)	Analyze different types of malwares and their effects on systems.	12	4	4
6(A)	Examine the challenges of social computing in organizations.	12	5	4
	OR			
6(B)	Analyze different types of web threats and their consequences.	12	5	4

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Question Paper Code: 23CST403

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS INSTITUTION)

B. Tech III Year II Semester (R23) Regular End Semester Examinations, May – 2026**DevOps**

(Computer Science & Technology)

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) What are DevOps practices?	1	1	1
	ii) What are DevOps roots?	1	1	1
	iii) What are Value Segments?	1	2	1
	iv) Define Customer Segments.	1	2	1
	v) What is a DevOps toolchain?	1	3	1
	vi) What is orchestration?	1	3	1
	vii) What is continuous improvement?	1	4	1
	viii) What is DevOps Center of Competency (CoC)?	1	4	1
	ix) What is DevOps transformation?	1	5	1
	x) What is DevOps adoption?	1	5	1
2(A)	Define DevOps. List and explain the key features of it with suitable examples.	12	1	2
OR				
2(B)	Apply the steps involved in creating a DevOps adoption playbook	12	1	3
3(A)	Explain channels and customer relationships in DevOps environments.	12	2	2
OR				
3(B)	Describe revenue streams and cost structures in DevOps adoption.	12	2	2
4(A)	Describe microservices architecture and its features.	12	3	2
OR				
4(B)	Define DevOps toolchain and explain its stages.	12	3	2
5(A)	Apply security practices in DevOps lifecycle.	12	4	3
OR				
5(B)	Describe DevOps Center of Competency (CoC) with its functions.	12	4	2
6(A)	Explain the DevOps adoption roadmap with stages.	12	5	2
OR				
6(B)	Describe the role of pilot projects in DevOps adoption.	12	5	2

*****END*****

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS INSTITUTION)**B. Tech III Year II Semester (R23) Regular End Semester Examinations, May – 2026****BIG DATA ANALYTICS**

(Computer Science and Technology)

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 Big Data Analytics.	1	1	1
	ii) What is Cluster Analysis?	1	1	1
	iii) State the role of visualization in analytics.	1	2	1
	iv) Define state of practice in analytics.	1	2	1
	v) What is the use of the Resource Manager in YARN?	1	3	1
	vi) Define MapReduce.	1	3	1
	vii) What is Apache Pig?	1	4	1
	viii) List any two Hive DDL commands.	1	4	1
	ix) What are the two types of streams in data handling?	1	5	1
	x) What is sentiment analysis?	1	5	1
2(A)	(i) Classify the types of data generated structured, semi-structured, and unstructured in this healthcare monitoring system.	6	1	2
	(ii) Interpret the steps involved in the KDD process and illustrate the role of each step.	6	1	3

OR**2(B)** Infer the following Retail dataset: 12 1 3

Transaction ID	Items Purchased
T1	Bread, Milk
T2	Bread, Diaper, Beer, Eggs
T3	Milk, Diaper, Beer, Coke
T4	Bread, Milk, Diaper, Beer
T5	Bread, Milk, Diaper, Coke

Tasks:

1. Use the Apriori algorithm to find all frequent item sets with minimum support = 60%.
2. Show step-by-step derivation of L1, L2, and L3.
3. Generate association rules with minimum confidence = 70%.

Identify strong rules with their support and confidence.

3(A)	(i) What is Big Data Business Analytics? Briefly explain its significance.	6	2	2
	(ii) Illustrate the role of a data scientist in a project team.	6	2	3

OR

3(B)	Infer how the iterative nature of an analytics life cycle improves the quality and relevance of outcomes.	12	2	3
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4(A)	Make use of common Hadoop Shell commands to: <ul style="list-style-type: none">• Upload a file to HDFS• List directory contents• Display file contents Delete a file from HDFS	12	3	3
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OR

4(B)	Apply your understanding of the MapReduce framework to explain the entire lifecycle of a MapReduce job, including stages like job submission, scheduling, execution, shuffle and sort, and output generation.	12	3	3
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5(A)	(i) Apply data manipulation commands in Hive to update, overwrite, and insert records into a transactional dataset	6	4	3
	(ii) Develop a Pig Latin script that applies built-in functions to calculate Maximum, Minimum and Average from a numeric dataset.	6	4	4

OR

5(B)	Given a Big Data dataset stored in HDFS, apply Hive for querying and Pig for data transformation, explaining the workflow with commands.	12	4	3
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6(A)	(i) Apply data processing techniques to detect insider trading activities from stock exchange logs.	6	5	3
	(ii) Evaluate the role of each layer in the analytic stack and justify which layer is most critical for scalable Big Data analytics.	6	5	4

OR

6(B)	Evaluate the impact of inaccurate sentiment analysis results on business and financial decision-making.	12	5	4
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Hall Ticket No:

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Question Paper Code: 23CST408

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS INSTITUTION)

B. Tech III Year II Semester (R23) Regular End Semester Examinations, May – 2026**DIGITAL FORENSICS**

(Computer Science & Technology)

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) What is computer forensics?	1	1	1
	ii) What is meant by 'digital evidence'?	1	1	1
	iii) Name any two hash algorithms used for evidence integrity verification.	1	2	1
	iv) Define evidence preservation	1	2	1
	v) Define 'slack space' in disk forensics.	1	3	1
	vi) What is file recovery?	1	3	1
	vii) How would you use FTK (Forensic Toolkit) to search for keywords in a disk image?	1	4	1
	viii) Name any two open-source digital forensic tools.	1	4	1
	ix) Name any two legal acts governing cybercrime investigations in India.	1	5	1
	x) What is digital forensic law?	1	5	1
2(A)	Explain challenges in digital forensics. Demonstrate how they are handled in practice.	12	1	3
	OR			
2(B)	Use the stages of the digital forensic investigation process to present a real-world example	12	1	3
3(A)	Examine the importance of maintaining a proper chain of custody to ensure evidence integrity, and evaluate the consequences of any breaches in the process	12	2	3
	OR			
3(B)	Explain various methods for storing and handling digital evidence securely. Discuss best practices to prevent data tampering.	12	2	2
4(A)	Explain disk structure and metadata analysis. Discuss how hidden data is recovered.	12	3	2
	OR			
4(B)	Illustrate with the example, the step-by-step process of recovering a deleted file from an NTFS partition using forensic tools.	12	3	3
5(A)	Explain cloud security models (such as IaaS, PaaS, and SaaS) and analyze their implications for forensic evidence collection and analysis	12	4	2
	OR			
5(B)	Evaluate different digital forensic toolkits based on features, usability, and cost. Justify your selection criteria.	12	4	2
6(A)	Explain various digital forensic laws and regulations. Discuss their importance in cybercrime investigations	6	5	2
	OR			
6(B)	Explain the legal framework governing digital forensic investigations. Discuss procedures for handling digital evidence in court	12	5	2

*****END*****