

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

(CSE-Networks)

**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 elasticity in cloud computing.	1	1	1
	ii) Mention the use of load balancing.	1	1	1
	iii) What is MapReduce?	1	2	1
	iv) Mention one date/time operation in Python.	1	2	1
	v) Mention the role of Python for GCP.	1	3	1
	vi) Name any two Python libraries used in cloud platform.	1	3	1
	vii) Define the term "Bigdata" in cloud computing.	1	4	1
	viii) What is video transcoding?	1	4	1
	ix) What is data security?	1	5	1
	x) Name any two applications of cloud computing for AI.	1	5	1
2(A)	Analyze the role of virtualization in improving cloud efficiency. Explain any three types of virtualizations with a neat diagram.	12	1	4
<b>OR</b>				
2(B)	(i) A healthcare organization needs to store sensitive patient data in a secure environment while using public cloud resources for less sensitive applications. Apply the suitable cloud deployment model and explain how it ensures security and flexibility.	6	1	3
	(ii) A software company wants to develop and deploy applications quickly without worrying about infrastructure management. Apply the appropriate cloud service model and explain its role in accelerating software development.	6	1	3
3(A)	A large e-commerce company stores terabytes of customer transaction data, product logs, and clickstream records in Apache Hadoop using the Hadoop Distributed File System. The company wants to analyze this huge dataset to identify customer purchasing patterns and product popularity during seasonal sales. To process this massive data efficiently, the organization uses the Hadoop MapReduce framework. The dataset is stored across multiple DataNode machines, while the NameNode manages metadata and block locations. Job scheduling and resource allocation are handled by the ResourceManager. When an analyst submits a MapReduce job to calculate sales statistics, Hadoop distributes the processing tasks across several nodes in the cluster. Analyze the Hadoop MapReduce job execution process with a neat diagram. Justify why components such as NameNode, ResourceManager (Master Node), and DataNodes are important in supporting Hadoop MapReduce job execution.	12	2	4

**OR**

<b>3(B)</b>	Analyze the Cloud Computing Reference Architecture defined by the National Institute of Standards and Technology (NIST). Illustrate the architecture with a neat diagram and discuss its advantages.	12	2	4
	A company wants to automate the process of uploading and retrieving files from cloud storage using Python scripts. Explain how Boto3 can be used to interact with AWS storage services such as Amazon S3. Analyze the steps involved in authentication, creating a client, and performing file upload operations.	12	3	4
<b>OR</b>				
<b>4(B)</b>	Demonstrate an Image processing App and Document storage App with a neat diagram.	12	3	3
<b>5(A)</b>	Analyze the following classification algorithms used in Big Data with suitable examples:	12	4	4
	a. Random Forest b. Support Vector Machine			
<b>OR</b>				
<b>5(B)</b>	Demonstrate various workload characteristics in cloud benchmarking.	12	4	3
<b>6(A)</b>	(i) Design an Identity and Access Management (IAM) strategy for securing cloud environments.	6	5	2
	(ii) Examine the effectiveness of key management strategies in protecting sensitive cloud data.	6	5	4
<b>OR</b>				
<b>6(B)</b>	(i) Infer the risks and benefits of cloud computing in energy systems.	6	5	4
	(ii) Assess how cloud contracting models affect small vs. large enterprises.	6	5	4

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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****INTERNETWORKING USING TCP/IP**

(CSE - Networks)

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 network-level interconnection.	1	1	1
	ii) State one function of a router.	1	1	1
	iii) Define error control in TCP.	1	2	1
	iv) What is IPv6?	1	2	1
	v) What is congestion control?	1	3	1
	vi) Define admission control.	1	3	1
	vii) What is Random Drop in queue management?	1	4	1
	viii) Define Active Queue Management (AQM).	1	4	1
	ix) What is SCTP packet format?	1	5	1
	x) Define tunneling in Mobile IP.	1	5	1
2(A)	(i) A browser requests a webpage from a remote server. Explain how application-layer protocols define message format, rules, and communication between client and server.	6	1	3
	(ii) Packets are routed through multiple networks without establishing a dedicated path. Apply connectionless interconnection to explain how routing and forwarding enable packet delivery.	6	1	2
<b>OR</b>				
2(B)	A global organization connects its offices using different network technologies and protocols. Apply the principles of internetworking and explain how TCP/IP architecture and logical addressing enable communication across heterogeneous networks.	12	1	4
3(A)	(i) A real-time messaging application uses a lightweight protocol. Explain UDP operation and discuss its advantages in such applications.	6	2	2
	(ii) A system experiences packet loss due to transmission errors. Apply error control mechanisms in TCP to explain how reliable delivery is ensured.	6	2	3
<b>OR</b>				
3(B)	A network experiences frequent packet loss and varying traffic conditions during data transmission. Apply TCP flow control, error control, and congestion control mechanisms to explain how reliable data transfer is achieved.	12	2	2
4(A)	(i) A multimedia application requires consistent bandwidth and low delay. Explain the concept of Quality of Service and its key parameters.	6	3	4
	(ii) A network needs to regulate traffic to avoid sudden bursts. Apply the Token Bucket algorithm to explain how traffic shaping controls congestion.	6	3	2

<b>OR</b>					
<b>4(B)</b>		A university network slows down significantly during online registration due to heavy traffic. Explain the causes, effects, and control of congestion in this scenario.	12	3	2
<b>5(A)</b>	(i)	A network suffers from inefficient congestion handling due to late packet drops. Explain the drawbacks of Passive Queue Management.	6	4	4
	(ii)	A router uses an algorithm that drops packets gradually as queue size increases. Apply the RED algorithm to explain how early packet dropping prevents congestion.	6	4	3
<b>OR</b>					
<b>5(B)</b>		A router must efficiently manage queues to prevent packet loss and delay. Analyze Passive and Active Queue Management techniques and evaluate their effectiveness in congestion control.	12	4	4
<b>6(A)</b>	(i)	A mobile user moves from one network to another while maintaining an active connection. Explain Mobile IP concepts including agent discovery and registration.	6	5	2
	(ii)	A mobile device experiences performance issues due to frequent disconnections. Apply Mobile TCP improvements to explain how transmission efficiency can be enhanced.	6	5	3
<b>OR</b>					
<b>6(B)</b>		A communication system compares TCP and SCTP for reliable data transfer in a distributed environment. Analyze SCTP features and explain how they improve performance compared to TCP.	12	5	4

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(UGC-AUTONOMOUS INSTITUTION)

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

(CSE- Networks)

**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 software engineering.	1	1	1
	ii) List any two Agile development methodology.	1	1	1
	iii) Give one example of a non-functional requirement.	1	2	1
	iv) List the types of software system model.	1	2	1
	v) List any two software design patterns.	1	3	1
	vi) What does a use case diagram represent?	1	3	1
	vii) Define software testing.	1	4	1
	viii) What is meant by testing metrics?	1	4	1
	ix) Why is statistical quality assurance used?	1	5	1
	x) What is defect prevention?	1	5	1
2(A)	(i) Explain the Scrum-based development approach for a web application.	6	1	2
	(ii) Discuss the roles, events, and artifacts involved in scrum-based process.	6	1	2
<b>OR</b>				
2(B)	Explain how CMMI practices can be used by a growing software company to improve process maturity and product quality.	12	1	2
3(A)	(i) Explain the data and object modelling techniques to represent requirements for a student information system.	6	2	2
	(ii) Explain the requirements validation techniques for a project where requirement defects are discovered during testing.	6	2	2
<b>OR</b>				
3(B)	Illustrate suitable requirements elicitation techniques for a healthcare system involving doctors, nurses, and administrative staff.	12	2	4
4(A)	(i) Apply the software design process to develop a design solution for a Hospital Management System.	6	3	3
	(ii) Apply interaction diagrams for an online booking system.	6	3	3
<b>OR</b>				
4(B)	A food delivery app experiences an increase in interaction messages from 8 to 12. If each message introduces a 100 ms delay, compute the total delay and evaluate its impact on performance.	12	3	3
5(A)	(i) Apply black-box testing techniques for a login module of an application.	6	4	3
	(ii) Analyze the process of generating test cases using functional and structural testing methods.	6	4	4
<b>OR</b>				
5(B)	Automated testing setup requires 100 hours initially but reduces manual testing time by 60%. Calculate how many manual testing hours are saved if manual testing originally took 300 hours, and	12	4	4

analyze break-even points.

<b>6(A)</b>	(i)	A Software system experiences 2 failures over a period of 1000 operating hours. Apply the Mean Time Between Failures (MTBF) formula to calculate system reliability.	6	5	3
	(ii)	Explain the significance of MTBF in software quality assurance.	6	5	2
<b>OR</b>					
<b>6(B)</b>		A project initially requires 400 hours for defect correction. After integrating QA practices with agile development, defect fixing time reduces by 25%. Analyze how this reduction affects project productivity, resource utilization, and delivery timelines. Discuss the broader implications for agile team performance.	12	5	4

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Question Paper Code: 23CSN401

**MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE**

(UGC-AUTONOMOUS INSTITUTION)

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

(CSE - Networks)

**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 image resolution.	1	1	1
	ii) Define aliasing.	1	1	1
	iii) Define histogram equalization.	1	2	1
	iv) Name any sharpening filter.	1	2	1
	v) Define high-pass filter.	1	3	1
	vi) Define salt-and-pepper noise.	1	3	1
	vii) Define HSI model.	1	4	1
	viii) Define dilation.	1	4	1
	ix) Define Huffman coding.	1	5	1
	x) List types of redundancy.	1	5	1
2(A)	Analyze image representation techniques (grayscale, color, bit-plane slicing) by examining their advantages and limitations for different applications.	12	1	4
<b>OR</b>				
2(B)	(i) Analyze bit-plane slicing technique and explain its applications.	6	1	4
	(ii) Analyze grayscale and color image representation and compare their usage.	6	1	4
3(A)	Apply histogram equalization and histogram matching techniques and examine their effectiveness in enhancing low-contrast images.	12	2	3
<b>OR</b>				
3(B)	(i) Apply sharpening filters and explain how they enhance edges.	6	2	3
	(ii) Apply Gaussian filtering and explain its smoothing characteristics.	6	2	3
4(A)	Analyze spatial domain and frequency domain filtering approaches by comparing their advantages, limitations, and applications.	12	3	4
<b>OR</b>				
4(B)	(i) Analyze low-pass and high-pass filters and explain their effects on images.	6	3	4
	(ii) Analyze homomorphic filtering and explain its purpose.	6	3	4
5(A)	Apply morphological operations (erosion, dilation, opening, closing) and examine their role in image preprocessing and noise removal.	12	4	3
<b>OR</b>				
5(B)	(i) Apply RGB and HSI color models and explain their usage in image processing.	6	4	3
	(ii) Apply pseudo-coloring techniques and explain their importance in visualization.	6	4	3
6(A)	Apply JPEG compression steps and examine how each stage contributes to compression efficiency.	12	5	3
<b>OR</b>				
6(B)	(i) Apply Huffman coding and explain how it achieves compression.	6	5	3
	(ii) Apply quantization in image compression and explain its effect on quality.	6	5	3

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Question Paper Code: 23CSN409

**MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE**

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

(CSE - Networks)

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) List any four types of cybercrimes	1	1	1
	ii) Differentiate between worms and viruses.	1	1	2
	iii) What is disk imaging?	1	2	1
	iv) Define chain of custody.	1	2	1
	v) What is meant by data acquisition in digital forensics?	1	3	1
	vi) What is forensic analysis?	1	3	1
	vii) What is FAT32?	1	4	1
	viii) Write the importance of packet capture.	1	4	1
	ix) Define boot process in DOS systems.	1	5	1
	x) What is the purpose of the Master File Table in NTFS?	1	5	1
2(A)	(i) Illustrate the steps involved in incident response methodology.	6	1	3
	(ii) Explain the various roles computers play in cybercrimes.	6	1	2
<b>OR</b>				
2(B)	Analyze and illustrate a real-world cybercrime case and identify the type of attack involved.	12	1	4
3(A)	(i) Describe the procedure for creating a forensic duplicate of a hard drive.	6	2	2
	(ii) Explain the challenges involved in collecting volatile data from Windows and Unix systems.	6	2	2
<b>OR</b>				
3(B)	Explain the complete procedure followed during initial response and volatile data collection in a cybercrime investigation.	12	2	2
4(A)	(i) Elaborate the process of determining what data should be collected during forensic analysis.	6	3	2
	(ii) Explain the working of any two network forensic tools with suitable examples.	6	3	2
<b>OR</b>				
4(B)	Analyze network forensics procedures and examine the honeynet concept for detecting and monitoring cyber threats.	12	3	4
5(A)	(i) Explain the role of forensic hardware tools in evidence acquisition.	6	4	2
	(ii) Describe the acquisition procedures used in mobile device forensics.	6	4	2
<b>OR</b>				
5(B)	Illustrate the structure and features of the NTFS file system and examine the sequence of Windows startup tasks.	12	4	3
6(A)	(i) Explain the working principles of file systems in Windows operating systems.	6	5	2
	(ii) Discuss the importance of NTFS artifacts in digital forensic investigations.	6	5	2
<b>OR</b>				
6(B)	Evaluate the role of virtual machines in malware analysis and forensic investigations.	12	5	3

\*\*\*END\*\*\*