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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

Examination : **B.Tech VII Semester Regular Examinations Nov/Dec-2025**
Course Name : **Software Testing Methodologies**
Course Code : **A405406**
Branch : **Computer Science & Engineering**
Date & Session : **24-11-2025 AN** **Duration: 3 hours** **Max. Marks: 60**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries ONE mark. **10x1=10M**

1. Differentiate Beta testing from Alpha testing — 1 M
2. Define Debugging. — 1 M
3. What is Data flow anomaly? — 1 M
4. What is Transaction? — 1 M
5. List the uses of Domain Testing. — 1 M
6. Define absorption rule. — 1 M
7. What is state transition? — 1 M
8. Write short notes on Logic Based Testing. — 1 M
9. What is meant by Tool building? — 1 M
10. Describe consequences of bugs and give examples. — 1 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). i) What is path testing? Give a note on path selection and predicates. — 5M
ii) List the elements of flow graph and explain each element with suitable diagram. — 5M

OR

11. B). Write reasons for different levels of testing and characteristics of good testing in life cycle model. — 10M

12. A). What is domain testing? Discuss nice and ugly domains with neat diagrams. — 10M

OR

12. B). Define basis path testing. Explain various steps to calculate the independent paths — 10M

13. A). i) Discuss in detail the domains and interface testing. — 5M
ii) Explain how the transaction flow graph is used in functional testing. — 5M

OR

13. B). Demonstrate an anomaly can be detected. Explain different types of data flow Anomalies and data flow anomaly state graphs. — 10M

14. A). Explain maximum path count arithmetic of a flow graph with an example. — 10M

OR

14. B). What are decision tables? Illustrate the applications of decision tables. How is a decision table useful in testing. Explain with an example. — 10M

15. A). With neat Diagram and examples, Reproduce the node reduction algorithm. — 10M

OR

15. B). Write about equivalence relation and partial ordering relation. Also discuss about power of matrix. — 10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
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Examination : **B.Tech VII Semester Regular Examinations Nov/Dec-2025**
Course Name : **Scripting Languages**
Course Code : **A405422/ A467411**
Branch : **CSE/ CSD**
Date & Session : **28-11-2025 AN** **Duration: 3 hours** **Max. Marks: 60**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries ONE mark. **10x1=10M**

1. What are CGI scripts? 1 M
2. List out the widgets in RubyTk. 1 M
3. What is the Jukebox extension? 1 M
4. Define Ruby interpreter. 1 M
5. List some characteristics of scripting languages. 1 M
6. What is web scripting? 1 M
7. Define a module and how it differs from a package. 1 M
8. List some common security issues when using PERL for web applications. 1 M
9. What is the purpose of the eval command in TCL? 1 M
10. How to declare and use variables in TCL? 1 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). Demonstrate the structure and execution flow of a Ruby program. 10M

OR

11. B). Explain how to set, retrieve, and manage cookies within Ruby-based web applications. 10M

12. A). Explain the process of embedding Ruby in other languages with an example. 10M

OR

12. B). Explain Ruby's garbage collection in the context of C extensions, focusing on memory allocation and marking objects. 10M

13. A). Explain the purpose and structure of subroutines in PERL. How do subroutines enhance PERL scripting? 10M

OR

13. B). Describe the different types of variables used in PERL programming. Provide examples of each type. 10M

14. A). Explain the Dirty hands internet programming and security issues. 10M

OR

14. B). How does object-oriented programming work in PERL? Illustrate with an example. 10M

15. A). Describe control flow structures like if, switch, while, and for in TCL. Provide examples of each. 10M

OR

15. B). Explain input/output operations in TCL with examples. 10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
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Examination : **B.Tech VII Semester Regular Examinations Nov/Dec-2025**
Course Name : **Cyber Security**
Course Code : **A405423**
Branch : **Computer Science & Engineering**
Date & Session : **01-12-2025 AN** **Duration: 3 hours** **Max. Marks: 60**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries ONE mark. **10x1=10M**

1.	Illustrate about Cyber Crimes.	1 M
2.	Which Software is used for Cyber Security?	1 M
3.	Examine Indian Cyber Space.	1 M
4.	Demonstrate Digital Evidence.	1 M
5.	Summarize Registry Setting for Mobile Devices.	1 M
6.	Evaluate Trends in Mobility.	1 M
7.	Outline Social Computing Associated Challenges.	1 M
8.	Identify IPR Issues.	1 M
9.	What are Data Privacy Attacks?	1 M
10.	Elaborate Data Linking and Profiling.	1 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A).	i) Summarize Challenges and Constraints in Internet Governance.	5M
	ii) Elaborate Cyber Security Policies.	5M
	OR	
11. B).	Identify Cyber Warfare and Cyber Espionage with a Case study.	10M
12. A).	i) Classify Historical Background of Cyber Forensics.	5M
	ii) Interpret Process of Forensics Investigation.	5M
	OR	
12. B).	i) Write about Digital Forensics Science.	5M
	ii) Identify Need of Computer Forensics.	5M
13. A).	i) Write a different type of Attacks on Mobile/Cell Phones.	5M
	ii) Summarize Authentication Security Services.	5M
	OR	
13. B).	Elaborate Organization Security Policies and Measures in Mobile Computing.	10M
14. A).	Evaluate Cyber Security and Privacy Implications.	10M
	OR	
14. B).	Examine Web Threats for Organization and challenges associated with it.	10M

(P.T.O..)

15. A). i) Distinguish Privacy Policy Languages. 5M

ii) Discuss the Need of Privacy in Medical Domain. 5M

OR

15. B). i) Outline Case study on Parliament attacks. 5M

ii) Summarize Case study on financial frauds in Cyber Domain. 5M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
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Examination	:	**B.Tech VII Semester Regular Examinations Nov/Dec-2025**
Course Name	:	**Robotic Process Automation**
Course Code	:	**A405413**
Branch	:	**Computer Science & Engineering**
Date & Session	:	**03-12-2025 AN** **Duration: 3 hours** **Max. Marks: 60**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries ONE mark. **10x1=10M**

1.	Define Robotic Process Automation.	1 M
2.	List any two components of UiPath.	1 M
3.	What is the difference between Sequence and Flowchart in UiPath?	1 M
4.	Define an Argument in UiPath.	1 M
5.	What is OCR? Mention two types of OCR used in UiPath.	1 M
6.	What is the purpose of the Terminal Plugin in RPA?	1 M
7.	Construct Exception Handling in UiPath.	1 M
8.	Asses the role of Logging in debugging?	1 M
9.	Choose the significance of State Machines in UiPath?	1 M
10.	Predict Orchestrator in UiPath.	1 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A).	What is the scope and techniques of automation. Describe the components of RPA in detail.	10M
	OR	
11. B).	Illustrate the UiPath Stack and explain the roles of UiPath Studio, UiPath Robot, and UiPath Orchestrator.	10M
12. A).	Construct in detail the different control flow activities in UiPath with examples.	10M
	OR	
12. B).	Select the Data Tables in UiPath with a step-by-step example of importing data from an Excel file.	10M
13. A).	Compare various methods of interacting with application controls. Explain the use of OCR in automation.	10M
	OR	
13. B).	Explain in detail the working of Citrix Automation and Credential Management in UiPath.	10M
14. A).	Justify the procedure to handle exceptions in UiPath. Illustrate with an example.	10M
	OR	
14. B).	Elaborate different debugging techniques and logging mechanisms in UiPath.	10M
15. A).	Demonstrate the organization of UiPath projects and discuss the reusability of workflows.	10M
	OR	
15. B).	Infer the process of deploying and maintaining bots using the UiPath Orchestrator.	10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
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Examination : **B.Tech VII Semester Regular Examinations Nov/Dec-2025**
Course Name : **Natural Language Processing**
Course Code : **A412421**
Branch : **Information Technology**
Date & Session : **24-11-2025 AN** **Duration: 3 hours** **Max. Marks: 60**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries ONE mark. **10x1=10M**

1. What is Natural Language Processing (NLP)? 1 M
2. What is Topic segmentation? 1 M
3. Define Syntax Tree. 1 M
4. What is Shallow Parsing? 1 M
5. Why is Semantic Analysis Important to NLP? 1 M
6. Define the terms Homonymy and Polysemy. 1 M
7. What is maximum likelihood probability? 1 M
8. What is meant by FrameNet? 1 M
9. List the applications of N-gram Language Model. 1 M
10. What is Cross-Lingual Language? 1 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). List and explain the issues and challenges of NLP Systems in detail. 10M

OR

11. B). Discuss in detail about finding the structure documents and its methods. 10M

12. A). Discuss syntax analysis using Dependency Graphs with an example. 10M

OR

12. B). Illustrate about Shift-Reduce Parsing with example. 10M

13. A). What are the different models for Ambiguity Resolution in Parsing, explain any one in detail with example. 10M

OR

13. B). Explain about various categories of Word Sense Systems. 10M

14. A). Explain about Predicate Argument Structure. Illustrate PropBank Concept using suitable example. 10M

OR

14. B). Discuss about Meaning Representation System. 10M

15. A). Explain about an N-gram language model and discuss its limitations in NLP. 10M

OR

15. B). How does multilingual NLP work and discuss solutions for tackling multilingual NLP challenges. 10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
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Examination : **B.Tech VII Semester Regular Examinations Nov/Dec-2025**
Course Name : **Software Testing Methodologies**
Course Code : **A412412**
Branch : **Information Technology**
Date & Session : **28-11-2025 AN** **Duration: 3 hours** **Max. Marks: 60**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries ONE mark. **10x1=10M**

1.	What is software testing and write its purpose?	1 M
2.	Write the applications of path testing.	1 M
3.	Write about any two applications of data flow testing.	1 M
4.	In what a nice domain differs from ugly domains?	1 M
5.	Applications of regular expression.	1 M
6.	What is logic-based testing?	1 M
7.	Define good state and bad state graphs.	1 M
8.	What is state transition?	1 M
9.	Define matrix of graph.	1 M
10.	Distinguish between manual testing and automated testing.	1 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A).	i) What is meant by program's control flow? How is it useful for path testing?	5M
	ii) Discuss various flow graph elements with their notations.	5M
	OR	
11. B).	i) What is meant by integration testing and what are the goals of it?	5M
	ii) What are control and sequence bugs? How they can be caught?	5M
12. A).	i) Compare data flow and path flow testing strategies.	5M
	ii) Distinguish between Control Flow and Transaction flow.	5M
	OR	
12. B).	i) What is meant by transaction flow testing. Discuss its significance?	5M
	ii) Compare data flow and path flow testing strategies.	5M
13. A).	Explain the usage of regular expression in flow anomaly detection.	10M
	OR	
13. B).	i) What is KV-Chart? Draw KV-chart for 4 variables?	5M
	ii) Explain Regular Expressions.	5M

(P.T.O.)

14. A). Differentiate between good state graphs and bad state graphs?. Also discuss about finite state machine. 10M

OR

14. B). i) What is the core principle of state testing? List out the advantages and disadvantages of state testing? 5M

ii) Write the guidelines to design state machines. 5M

15. A). i) Elaborate node reduction algorithm with an example. 5M

ii) Explain power of matrix. 5M

OR

15. B). i) Categorize various testing tools necessary for testing. 5M

ii) What are the uses of selenium? 5M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
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Examination : **B.Tech VII Semester Regular Examinations Nov/Dec-2025**
Course Name : **Human Computer Interaction**
Course Code : **A412413**
Branch : **Information Technology**
Date & Session : **01-12-2025 AN** **Duration: 3 hours** **Max. Marks: 60**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries ONE mark. **10x1=10M**

1. Define User Interface (UI). 1 M
2. Mention any two benefits of a good user interface design. 1 M
3. Why are human characteristics important in UI design? 1 M
4. What is the role of statistical graphics in interface design? 1 M
5. What are the advantages of using multimedia elements in an interface? 1 M
6. Differentiate between device-based and screen-based controls. 1 M
7. List the factors that influence the choice of an evaluation method. 1 M
8. Define usability engineering. 1 M
9. What are goal and task hierarchies? 1 M
10. What is the main challenge of display-based systems? 1 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). Explain the importance of user interface design in software development. 10M

OR

11. B). What is direct manipulation? Describe its role in improving user interaction. 10M

12. A). Explain various human considerations that influence interface usability. 10M

OR

12. B). Explain the principles of organizing screen elements and ordering data and content. 10M

13. A). Discuss the various navigation schemes used in windows-based systems. 10M

OR

13. B). Describe the impact of multimedia on user interface design. 10M

14. A). Evaluate the impact of universal design on accessibility and inclusivity. 10M

OR

14. B). Explain the concept and applications of multimodal interaction in modern systems. 10M

15. A). Explain the importance of visualization in data representation. 10M

OR

15. B). Propose a conceptual design combining ubiquitous computing and augmented reality for smart environments. 10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
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Examination : **B.Tech VII Semester Regular Examinations Nov/Dec-2025**
Course Name : **Deep Learning**
Course Code : **A412419**
Branch : **Information Technology**
Date & Session : **03-12-2025 AN** **Duration: 3 hours** **Max. Marks: 60**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries ONE mark. **10x1=10M**

1. What is learning? 1 M
2. What is gradient descent? 1 M
3. What is data augmentation in deep learning? 1 M
4. Define Bagging and Boosting. 1 M
5. What are the different types of Pooling? 1 M
6. What is the purpose of activation functions in a CNN? 1 M
7. What is Bidirectional RNN's? 1 M
8. Define Explicit Memory. 1 M
9. What is Speech Recognition? 1 M
10. Define Performance Metrics and give any four metrics. 1 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). What is the difference between supervised and unsupervised learning algorithms? Explain with examples. 10M

OR

11. B). Define Perceptron and Elaborate in detail about Back-Propagation. 10M

12. A). What is the learning rate in deep learning optimization, and how does it affect the performance of the model. 10M

OR

12. B). Describe parameter tying and parameter sharing in neural networks. Provide examples of where these techniques are used and their impact on model performance. 10M

13. A). Given a set of variables, identify their appropriate conventional data types and justify your choices. 10M

OR

13. B). Describe the max pooling operation and average pooling operation in CNNs. How do they differ in terms of feature extraction. 10M

14. A). What are the challenges of using gradient descent in deep learning optimization, and how can they be addressed? 10M

OR

14. B). What is a convolutional neural network (CNN), and how does it differ from a traditional neural network, discuss in brief about Alexnet architecture. 10M

(P.T.O.)

15. A). What is semantic segmentation, and how is it different from other computer vision tasks such as image classification and object detection? 10M

OR

15. B). Categorize the default baseline models used in machine learning based on the performance 10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
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Examination : **B.Tech VII Semester Regular Examinations Nov/Dec-2025**
Course Name : **IoT Security**
Course Code : **A462411**
Branch : **CSC**
Date & Session : **28-11-2025 AN** **Duration: 3 hours** **Max. Marks: 60**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries ONE mark. **10x1=10M**

1.	Mention one difference between IoT devices and computers.	1 M
2.	Give one example of M2M communication.	1 M
3.	Define RFID.	1 M
4.	What is a cyber-physical system?	1 M
5.	What is Merkle Tree?	1 M
6.	What is a secure IoT database?	1 M
7.	Illustrate the alternatives to Bitcoin consensus.	1 M
8.	What are the functions of Network Security?	1 M
9.	How Authentication Techniques Secure IoT Lower Layers?	1 M
10.	What is P2P network?	1 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A).	Explain the need for security in IoT systems and discuss common threats and solutions.	10M
	OR	
11. B).	Compare IoT devices, embedded devices, and general-purpose computers with examples.	10M
12. A).	Explain IoT vulnerabilities, attacks, and countermeasures with real examples.	10M
	OR	
12. B).	Discuss the role of sensors and actuators in IoT with neat diagrams	10M
13. A).	Discuss IoT security life cycle with phases and real-time applications.	10M
	OR	
13. B).	Enumerate How to improve Security IoT Databases.	10M
14. A).	Describe IoT networking protocols and their role in secure communication.	10M
	OR	
14. B).	Discuss Bitcoin architecture and scripting language features.	10M
15. A).	Explain Ethereum structure and smart contract execution with examples.	10M
	OR	
15. B).	Identify the main verification challenges that arise in ensuring the security of IoT devices and networks?	10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
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Examination	:	**B.Tech VII Semester Regular Examinations Nov/Dec-2025**
Course Name	:	**Web & Database Security**
Course Code	:	**A462414**
Branch	:	**CSC**
Date & Session	:	**01-12-2025 AN** **Duration: 3 hours** **Max. Marks: 60**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries ONE mark. **10x1=10M**

1.	What is Risk Analysis?	1 M
2.	List the three parts of securing a web server.	1 M
3.	Emphasize the need for data backup.	1 M
4.	Write any four design principles that form the foundation of computer security.	1 M
5.	Define access control service.	1 M
6.	What is compliance checking?	1 M
7.	Differentiate between water marking and steganography.	1 M
8.	State the goal of trustworthy record retention.	1 M
9.	What does k-anonymity imply?	1 M
10.	Write any two privacy policies in mobile environment.	1 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A).	Explain the five distinct roles that encryption plays in modern information systems, as identified by security professionals, along with the specific keywords associated with each role.	10M
	OR	
11. B).	i) Justify the statement "Digital signatures facilitate proofs of identity, but they are not proofs of identity by themselves".	5M
	ii) Discuss why cryptography is not an appropriate solution for certain problems, and list examples of such problems.	5M
12. A).	Explain about privacy protecting techniques.	10M
	OR	
12. B).	What are the nine widespread Internet practices that have weakened host security over the past decade?	10M
13. A).	Illustrate with an example how an adversary can infer sensitive or prohibited data from legitimate queries in an OLAP system, highlighting how this differs from security concerns in traditional databases.	10M
	OR	
13. B).	Describe how access control enforcement operates when a user requests an object in a system.	10M

(P.T.O.)

14. A). Explain trustworthy records retention. 10M

OR

14. B). Draw and explain the Generic HDB Compliance Auditing Architecture. 10M

15. A). Discuss in brief about the Generic Bayesian Privacy Model. 10M

OR

15. B). Elaborate on any two Location privacy techniques. 10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
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Examination	:	**B.Tech VII Semester Regular Examinations Nov/Dec-2025**
Course Name	:	**Security Incident & Response Management**
Course Code	:	**A462419**
Branch	:	**CSC**
Date & Session	:	**03-12-2025 AN** **Duration: 3 hours** **Max. Marks: 60**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries ONE mark. **10x1=10M**

1.	Define a security incident.	1 M
2.	Mention two responsibilities of an IR team.	1 M
3.	What is live data collection in digital forensics?	1 M
4.	What is forensic duplication?	1 M
5.	Name any two tools used for network monitoring.	1 M
6.	What is a firewall log?	1 M
7.	Define "Know your data" in forensic analysis.	1 M
8.	Name any two tools used for NTFS file system analysis.	1 M
9.	Define HFS.	1 M
10.	Which folder stores macOS system logs?	1 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A).	Explain in detail the phases of Incident Response. Why is each phase important in managing cybersecurity incidents?	10M
	OR	
11. B).	With suitable examples, explain how case notes and documentation assist in cybersecurity incident investigation.	10M
12. A).	With commands and tools, explain how live data collection is performed in Windows systems & Unix-based systems.	10M
	OR	
12. B).	With a neat flowchart, explain the data acquisition process in digital forensics and highlight challenges in live data collection.	10M
13. A).	Discuss different types of network monitoring systems with examples.	10M
	OR	
13. B).	Discuss how logs generated from network events are collected and analyzed.	10M
14. A).	Explain the forensic data analysis methodology with neat steps.	10M
	OR	
14. B).	Explain Memory Forensics and discuss tools & techniques used.	10M
15. A).	Explain the HFS file system architecture and its significance in macOS forensics.	10M
	OR	
15. B).	Discuss forensic techniques for examining email clients and instant messaging applications on macOS.	10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
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Examination : **B.Tech VII Semester Regular Examinations Nov/Dec-2025**
Course Name : **Block Chain Technology**
Course Code : **A467423**
Branch : **CSD**
Date & Session : **24-11-2025 AN** **Duration: 3 hours** **Max. Marks: 60**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries ONE mark. **10x1=10M**

1. What is decentralization in blockchain? 1 M
2. Why is a nonce used in blockchain mining? 1 M
3. What are the advantages of using public blockchains? 1 M
4. Define a smart contract. 1 M
5. Expand the term "PBFT". 1 M
6. What is the purpose of a state machine in blockchain? 1 M
7. Mention one security challenge in blockchain. 1 M
8. List any two applications of blockchain technology. 1 M
9. Define chaincode in Hyperledger. 1 M
10. Name any one blockchain application in the retail sector. 1 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). Differentiate between various types of blockchain networks (public, private, and consortium). 10M

OR

11. B). Discuss the components of a blockchain with a neat diagram. 10M

12. A). List and explain the explain the Characteristics of a smart contract. 10M

OR

12. B). i) What are blockchain oracles? Explain their types and importance. 5M
ii) Analyze the types of smart contracts and their use cases in real-world industries. 5M

13. A). Explain the working principle of Multichain and its role in private blockchain applications. 10M

OR

13. B). Examine how a private blockchain could be applied in an e-commerce application by analyzing its steps, components, and their interactions. 10M

14. A). Design a secure blockchain model for e-healthcare data management and explain its working. 10M

OR

14. B). Discuss in detail the identity management, authentication, and regulatory aspects in blockchain security. 10M

(P.T.O..)

15. A). Draw flowchart to demonstrate workflow of Hyperledger Fabric. 10M

OR

15. B). i) Describe the process of blockchain development using Python with examples. 5M

ii) Describe how blockchain improves transparency in energy and utility systems. 5M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

Examination : **B.Tech VII Semester Regular Examinations Nov/Dec-2025**
Course Name : **Randomized Algorithms**
Course Code : **CSM/ AIM**
Branch : **A466422/ A473422**
Date & Session : **24-11-2025 AN** **Duration: 3 hours** **Max. Marks: 60**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries ONE mark. **10x1=10M**

1. What is the focus of randomized algorithms in game theory? 1 M
2. What is the use of Binary Planar Partition? 1 M
3. What does Markov's inequality state? 1 M
4. Define two-point sampling in probability estimation. 1 M
5. How can you verify whether two polynomials are identical? 1 M
6. What is a key trade-off when comparing fingerprinting techniques? 1 M
7. What is a Random Treap in data structures? 1 M
8. How does a skip list improve over a linked list? 1 M
9. What is the main idea of randomized incremental construction (RIC)? 1 M
10. What is a half-space in geometry? 1 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). How are probabilistic recurrence relations used to analyze randomized algorithms? Illustrate with an example. 10M

OR

11. B). Describe Karger's randomized algorithm for finding a minimum cut in a graph. 10M

12. A). Compare and contrast Markov and Chebyshev inequalities. 10M

OR

12. B). Analyze the expected number of trials needed in the coupon collector's problem and its applications. 10M

13. A). Explain how fingerprinting verifies string equality efficiently and probabilistically. 10M

OR

13. B). Describe Freivald's algorithm and explain how fingerprinting reduces verification time. 10M

14. A). Explain how a skip list works and analyze its time complexity on various operations. 10M

OR

14. B). Compare and contrast Kruskal's and Prim's algorithms for finding minimum spanning trees. 10M

15. A). Describe an efficient algorithm to compute the convex hull of points in the plane and analyze its complexity. 10M

OR

15. B). Explain a parallel algorithm for computing maximal independent sets. 10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

Examination	:	**B.Tech VII Semester Regular Examinations Nov/Dec-2025**
Course Name	:	**Web and Social Media Analytics**
Course Code	:	**A467415**
Branch	:	**CSD**
Date & Session	:	**01-12-2025 AN** **Duration: 3 hours** **Max. Marks: 60**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries ONE mark. **10x1=10M**

1.	Define decision support analytics.	1 M
2.	What are the three main types of business analytics?	1 M
3.	Name one key difference between data mining and text mining.	1 M
4.	What is KNIME used for in text mining?	1 M
5.	What does feature extraction mean in sentiment analysis?	1 M
6.	What is sentiment scoring?	1 M
7.	What is the role of metadata in search engines?	1 M
8.	What kind of data source is used for web usage mining?	1 M
9.	What does impression mean in social media analytics?	1 M
10.	How is goal seeking different from what-if analysis?	1 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A).	Describe how data analytics and BI tools can be used to manage the vaccine supply chain effectively and safely. Include examples of forecasting, logistics, and cold chain monitoring.	10M
	OR	
11. B).	Discuss the 5Vs of Big Data and their importance in business analytics.	10M
12. A).	i) Describe in detail the steps of the text mining process	5M
	ii) Discuss the differences between human intelligence and machine intelligence as demonstrated in the *Jeopardy* competition.	5M
	OR	
12. B).	Explain the architecture and working of Watson, highlighting how it uses natural language processing and machine learning to generate answers.	10M
13. A).	Define speech analytics and explain how it complements sentiment analysis in understanding customer emotions.	10M
	OR	
13. B).	Define sentiment analysis and explain its importance in understanding customer opinions and market perception.	10M

(P.T.O..)

14. A). Define SEO and explain its importance in improving website visibility and ranking. 10M

OR

14. B). Explain the techniques used in web structure mining to analyze hyperlink connections and improve web navigation. 10M

15. A). Define sensitivity analysis and explain its role in understanding the effect of variable changes in decision models. 10M

OR

15. B). Discuss the key metrics and KPIs used to evaluate performance on social media platforms. 10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
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Examination : **B.Tech VII Semester Regular Examinations Nov/Dec-2025**
Course Name : **Cloud Computing**
Course Code : **A467418**
Branch : **CSD**
Date & Session : **03-12-2025 AN** **Duration: 3 hours** **Max. Marks: 60**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries ONE mark. **10x1=10M**

1.	Examine the difference between public cloud and private cloud.	1 M
2.	Discuss utility computing.	1 M
3.	Classify one example of a Web 2.0 application.	1 M
4.	Explain the main purpose of Service-Oriented Architecture.	1 M
5.	What does the "Reduce" function do in MapReduce?	1 M
6.	Select any one benefit of developing software in the cloud.	1 M
7.	What is the main goal of a data center?	1 M
8.	Explain one protocol used at the transport layer in DCNs.	1 M
9.	Explain data encryption.	1 M
10.	What is cloud security?	1 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A).	Discuss cloud security management practices and the challenges involved.	10M
	OR	
11. B).	Explain cloud deployment models Public, Private, Hybrid with suitable diagrams.	10M
12. A).	What is an application environment? Explain different types and components of application environments in modern computing.	10M
	OR	
12. B).	Explain the role of operating systems in managing resources in cloud and pervasive computing environments.	10M
13. A).	Build in detail about complete life cycle of cloud-based software development, including stages like development, testing, deployment, and monitoring.	10M
	OR	
13. B).	What are the benefits and drawbacks of developing software in the cloud compared to traditional development environments.	10M
14. A).	Analyze the relationship between data centers and cloud service providers. How do data center capabilities impact cloud services.	10M
	OR	
14. B).	What is a cloud service provider? Demonstrate in detail the role of AWS as a cloud service provider and its services.	10M

(P.T.O..)

15. A). Explain the platform related security issues in cloud computing. 10M

OR

15. B). Imagine that You are storing sensitive user data on a public cloud. What security measures would you implement to protect the data. 10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
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Examination	:	**B.Tech VII Semester Regular Examinations Nov/Dec-2025**
Course Name	:	**Professional Practice, Law & Ethics**
Course Code	:	**A466310/ A473309**
Branch	:	**CSM/ AIM**
Date & Session	:	**26-11-2025 AN** **Duration: 3 hours** **Max. Marks: 60**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries ONE mark. **10x1=10M**

1.	Identify any one difference between gift and bribery.	1 M
2.	What is whistle blowing in professional practice?	1 M
3.	Identify one essential element of free consent.	1 M
4.	What is a contingent contract?	1 M
5.	State one type of arbitration.	1 M
6.	What is international commercial arbitration?	1 M
7.	Define an arbitration agreement.	1 M
8.	What is a Dispute Resolution Board?	1 M
9.	What is copyright under Indian law?	1 M
10.	Define intellectual property.	1 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A).	Illustrate with suitable examples how conflict of interest and gift vs bribery situations can affect ethical decision-making in engineering.	10M
	OR	
11. B).	Explain the vigil mechanism and whistle-blowing process for ensuring accountability in professional organizations.	10M
12. A).	Analyze the differences between unlawful and illegal agreements with relevant examples.	10M
	OR	
12. B).	Explain the rights and duties under a contract of agency and the remedies for breach of contract.	10M
13. A).	Analyze the scope and types of arbitration and explain how they are applied in domestic and international disputes.	10M
	OR	
13. B).	Explain the extent of judicial intervention in arbitration proceedings and its importance in upholding fairness.	10M

(P.T.O.)

14. A). Analyze the procedure, powers, and jurisdiction of an arbitral tribunal, including grounds for challenge. 10M

OR

14. B). Explain the distinctions between conciliation, negotiation, mediation, and arbitration with suitable examples. 10M

15. A). Analyze the ownership, assignment, and infringement criteria of copyright in India, including computer programs. 10M

OR

15. B). Explain the remedies and procedures available under Indian law for copyright piracy on the Internet. 10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
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Examination : **B.Tech VII Semester Regular Examinations Nov/Dec-2025**
Course Name : **Data Mining**
Course Code : **A466409/ A473409**
Branch : **CSM/ AIM**
Date & Session : **28-11-2025 AN** **Duration: 3 hours** **Max. Marks: 60**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries ONE mark. **10x1=10M**

1.	Define data mining and list its major functionalities.	1 M
2.	Explain the different types of data objects and attribute types.	1 M
3.	Explain support and confidence measures.	1 M
4.	Differentiate between Apriori and FP-growth algorithms.	1 M
5.	Explain the decision tree induction process.	1 M
6.	Justify the use of ensemble methods to improve classification accuracy.	1 M
7.	Define clustering and its importance.	1 M
8.	Assess the role of outlier detection in data mining.	1 M
9.	Discuss spatial data mining primitives for geographic data.	1 M
10.	Assess the importance of temporal association rules.	1 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A).	Illustrate various data pre-processing techniques with examples.	10M
	OR	
11. B).	Evaluate the limitations and challenges in large-scale data mining.	10M
12. A).	Evaluate the efficiency of FP-Growth algorithm over Apriori.	10M
	OR	
12. B).	Describe the market basket analysis process with an example.	10M
13. A).	Describe various classification techniques with examples.	10M
	OR	
13. B).	Analyze metrics used for evaluating classifier performance.	10M
14. A).	Demonstrate the steps of DBSCAN clustering on a sample dataset.	10M
	OR	
14. B).	Evaluate clustering results using internal and external validation indices.	10M
15. A).	Summarize types of web mining and their industrial uses.	10M
	OR	
15. B).	Evaluate how spatial and temporal mining contribute to decision-making.	10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
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Examination : **B.Tech VII Semester Regular Examinations Nov/Dec-2025**
Course Name : **Expert Systems**
Course Code : **A466414/ A473414**
Branch : **CSM/ AIM**
Date & Session : **01-12-2025 AN** **Duration: 3 hours** **Max. Marks: 60**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries ONE mark. **10x1=10M**

1. Define heuristic search and describe how hill-climbing works in the context of AI. 1 M
2. Define the A algorithm and its key components. 1 M
3. What is the frame problem in rule-based systems? 1 M
4. What is a rule-based deduction system? 1 M
5. What is the main function of the inference engine in an expert system? 1 M
6. What is the role of the knowledge base in Expert Systems? 1 M
7. What is the purpose of an explanation facility in an expert system? 1 M
8. What is the main objective of the testing and validation stage in expert system development? 1 M
9. List out the factors to consider when choosing a tool for developing an expert system. 1 M
10. What is a key role of domain experts in expert system development? 1 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). Explain how hill-climbing search can be applied to solve a local optimization problem. 10M

OR

11. B). i) What is a State – Space search? 4M
ii) Demonstrate Alpha-beta pruning in detail. 6M

12. A). Explain in detail the use of predicate logic for knowledge representation. What are the limitations of predicate logic. 10M

OR

12. B). Discuss Forward Chaining and Backward Chaining in Rule-Based Systems. 10M

13. A). Describe the architecture of an expert system in detail. What are its main components and explain how they work together to solve complex problems with example. 10M

OR

13. B). Compare various knowledge representation techniques used in expert systems and discuss their advantages and disadvantages. Explain how knowledge is represented and organized in expert systems. 10M

14. A). Explain the concept of knowledge engineering and discuss its significance in the development of expert systems. 10M

OR

14. B). Describe the types of support facilities that are essential for maintaining and enhancing expert systems. 10M

(P.T.O.)

15. A). Explain the main stages of expert system development. Discuss the key activities and challenges associated with each stage. 10M

OR

15. B). Discuss the problems with expert systems and explain the techniques used in obtaining knowledge from experts. 10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
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Examination : **B.Tech VII Semester Regular Examinations Nov/Dec-2025**
Course Name : **Social Network Analysis**
Course Code : **A466417/ A473417**
Branch : **CSM/ AIM**
Date & Session : **03-12-2025 AN** **Duration: 3 hours** **Max. Marks: 60**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries ONE mark. **10x1=10M**

1.	What is a social network?	1 M
2.	How video conferencing tools benefit for social media collaboration?	1 M
3.	Write any two visual metrics used in NodeXL for social analysis.	1 M
4.	What is network centrality measure?	1 M
5.	How can thread networks be visualized?	1 M
6.	Mention any two modern technologies you use to represent Twitter data.	1 M
7.	What is a force-directed layout in network visualization?	1 M
8.	What is an external hyperlink?	1 M
9.	What is the significance of likes and comments on YouTube videos?	1 M
10.	How can collaboration enhance creativity in wiki networks?	1 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A).	Explain in detail the components of social network analysis and their relevance in analyzing social behaviour.	10M
	OR	
11. B).	Analyze the ethical and privacy concerns that arise from using advanced collaborative technologies in social media. How can they be addressed?	10M
12. A).	i) Discuss the process of extracting and labelling social data using NodeXL by taking sample data.	5M
	ii) Draw the visualization of your sample data by taking different layouts.	5M
	OR	
12. B).	Explain the significance of visualizing network metrics for network analysis.	10M
13. A).	Discuss in detail about contribution of social content flow in thread networks and E-mail list.	10M
	OR	
13. B).	i) Analyze how trending hashtags reflect information diffusion.	5M
	ii) Illustrate the anatomy of a Twitter trend graph.	5M

(P.T.O..)

14. A). Examine the relationship between hyperlink networks and user engagement by taking sample data and justify. 10M

OR

14. B). Describe the significance of visualizing Facebook networks for social network analysis. 10M

15. A). Evaluate the influence of social network structures on the spread of YouTube content. 10M

OR

15. B). i) What is the significance of network density and centrality? 5M

ii) Explain the importance of Wiki collaboration in content development. 5M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
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Examination	:	**B.Tech VII Semester Regular Examinations Nov/Dec-2025**
Course Name	:	**Artificial Intelligence Applications**
Course Code	:	**A4MD207**
Branch	:	**Minor Programme in AIML**
Date & Session	:	**15-12-2025 AN** **Duration: 3 hours** **Max. Marks: 60**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries ONE mark. **10x1=10M**

1.	Name any two properties of Natural Language Processing.	1 M
2.	List the major difference between AI and Quantum Computing.	1 M
3.	Recall the use of emotion recognition in AI systems.	1 M
4.	Show how AI can predict diseases at an early stage.	1 M
5.	Outline the function of Robotic Process Automation (RPA).	1 M
6.	Summarize the benefits of using RPA in supply chain management.	1 M
7.	Define AI-Optimized Hardware.	1 M
8.	Outline the concept of a Digital Twin.	1 M
9.	List two recent trends in AI/ML.	1 M
10.	Summarize how AI/ML can contribute to solving social problems.	1 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A).	Explain the linguistic components of Natural Language Processing (NLP) and illustrate how semantics and syntax are processed by AI-based systems.	10M
	OR	
11. B).	Compare and contrast Artificial Intelligence and Quantum Computing in terms of computation speed, problem-solving capacity, and architecture.	10M
12. A).	Illustrate the role of AI in emotion recognition using facial and body language analysis.	10M
	OR	
12. B).	Apply machine learning algorithms to develop an AI-based system for early disease prediction — outline the workflow and key algorithms.	10M
13. A).	Identify the operations of Robotic Process Automation (RPA) and explain its significance in modern supply chain management.	10M
	OR	
13. B).	Illustrate with examples how RPA can optimize repetitive business operations in logistics and inventory control.	10M

(P.T.O..)

14. A). Explain the architecture and functioning of AI-optimized hardware with suitable examples. 10M

OR

14. B). Apply the concept of a Digital Twin to model a real-world industrial system — explain how AI enhances its predictive capabilities. 10M

15. A). Explain the integration of AI/ML in Smart City solutions — discuss any two real-life implementations. 10M

OR

15. B). Analyze how AI/ML can be used to address complex social problems such as healthcare access or education inequality. 10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
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Examination : **B.Tech VII Semester Regular Examinations Nov/Dec-2025**
Course Name : **Fundamentals of Exploratory Data Analysis**
Course Code : **A4MD107**
Branch : **Minor Programme in Data Science**
Date & Session : **15-12-2025 AN** **Duration: 3 hours** **Max. Marks: 60**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries ONE mark. **10x1=10M**

1. What is the main goal of EDA? 1 M
2. What are the basic data types used in data analysis? 1 M
3. List any two causes of missing data. 1 M
4. What is over-imputation? 1 M
5. What is data summarization? 1 M
6. Define correlation. 1 M
7. How are z-scores used to detect outliers? 1 M
8. What is greedy selection in feature selection? 1 M
9. Why is dimensionality reduction important in data analysis? 1 M
10. In which field is CA commonly used? 1 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). Discuss each stage of the Data Analytics Lifecycle and its importance in a data analytics project. 10M

OR

11. B). Explain EDA with motivation and steps in data exploration. 10M

12. A). Explain in detail the traditional methods for handling missing data such as list wise deletion, pairwise deletion, and mean imputation. 10M

OR

12. B). Discuss the role of software tools in performing analysis and pooling in multiple imputation. 10M

13. A). Describe how univariate analysis helps in summarizing and understanding dataset patterns. 10M

OR

13. B). Compare contrast the univariate, bivariate, and multivariate data analysis approaches. 10M

14. A). Discuss how clustering algorithms like K-Means and DBSCAN help identify outliers. 10M

OR

14. B). Explain the three main categories of feature selection algorithms – filter, wrapper, and embedded methods. 10M

15. A). Explain the working principle of Principal Component Analysis (PCA) with mathematical formulation. 10M

OR

15. B). Discuss the difference between Principal Component Analysis and Factor Analysis. 10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
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Examination : **B.Tech VII Semester Regular Examinations Nov/Dec-2025**
Course Name : **Soft Computing**
Course Code : **A405410**
Branch : **Honors Programme in CSE**
Date & Session : **15-12-2025 AN** **Duration: 3 hours** **Max. Marks: 60**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries ONE mark. **10x1=10M**

1. Define soft computing. 1 M
2. Differentiate between hard computing and soft computing. 1 M
3. List the basic operations on fuzzy sets. 1 M
4. Identify the main components of a fuzzy rule-based system. 1 M
5. Differentiate between individual and social learning in PSO. 1 M
6. State any two applications of PSO in optimization problems. 1 M
7. Differentiate between crossover and mutation operators. 1 M
8. State two real-world applications of Genetic Algorithms. 1 M
9. List the basic components of a rough set. 1 M
10. Differentiate between rough sets and fuzzy sets. 1 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). Discuss the various methods used in soft computing with suitable examples. 10M

OR

11. B). Analyze the role of evolutionary computing in solving optimization problems. 10M

12. A). Discuss fuzzy relations and explain how they differ from classical relations. 10M

OR

12. B). Analyze the working of a fuzzy rule-based system with a suitable block diagram. 10M

13. A). Analyze the working principle and mathematical model of Particle Swarm Optimization. 10M

OR

13. B). Evaluate the advantages and limitations of fuzzy decision-making models in uncertain environments. 10M

14. A). Describe the Genetic Algorithm cycle with a neat diagram. 10M

OR

14. B). Evaluate the role of fitness functions in determining the success of Genetic Algorithms. 10M

15. A). Explain the concept and mathematical foundation of rough set theory. 10M

OR

15. B). Describe the process of rule induction using rough sets with an example. 10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
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Examination : **B.Tech VII Semester Regular Examinations Nov/Dec-2025**
Course Name : **Block Chain Technology**
Course Code : **A405414**
Branch : **Honors Programme CSE**
Date & Session : **16-12-2025 AN** **Duration: 3 hours** **Max. Marks: 60**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries ONE mark. **10x1=10M**

1. Define Block chain. 1 M
2. List the benefits of a distributed ledger. 1 M
3. What is the relationship between Satoshi and bitcoin? 1 M
4. Define Smart Contract. 1 M
5. List some of the consensus algorithms of private blockchain. 1 M
6. What are the types of nodes in hyperledger? 1 M
7. Compare and contrast the concepts of Security and Privacy. 1 M
8. How data integrity issue in finance domain can be tackled in blockchain? 1 M
9. What is the purpose of os.getcwd() command? 1 M
10. Write a Function in python to calculate factorial of an input number. 1 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). Classify the various types of blockchain and analyze their main characteristics. 10M

OR

11. B). Define consensus algorithms and explain Proof of Work (PoW) and Proof of Elapsed Time (PoET). 10M

12. A). What is bitcoin? What is the thought process behind it? What are the main futures of bitcoin? 10M

OR

12. B). Identify the different types of Ethereum nodes and explain the three fundamental tasks miners carry out on mining nodes. 10M

13. A). What is a private blockchain? Explain some key characteristics of blockchain in detail. 10M

OR

13. B). Demonstrate transaction within hyperledger fabric. 10M

14. A). Analyze the security aspects of Bitcoin in detail. 10M

OR

14. B). What are challenges of the financial sector? List down how finance sector can leverage blockchain for the benefits? 10M

(P.T.O..)

15. A). Evaluate the use of blockchain within the banking industry and explain, with a case study, its benefits in securing transactions, enabling efficient cross-border payments and mitigating fraud risks. 10M

OR

15. B). Illustrate the use cases and capabilities of the following Python modules: 10M

i) Exchange Module
ii) Pushtx Module
iii) V2.Receive Module
iv) Statistics Module.

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