SMT. INDIRA GANDHI COLLEGE OF ENGINEERING

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END SEMESTER EXAMINATION (SIGCE R-19 C SCHEME)

QP Code: 4571113

Date: 28/10/2025

Subject Name: Machine Learning & Block Chain

Max Marks: 80

Subject Code:IoTCSBCC701 Branch:IOTCSBC

Sem: VII

Duration: 03 hours

Note:

1) This is one of possible solution/marks schemes. There might be multiple ways to write answers while keeping concepts intact.
2) Presentation Skill carries weightage within distributed marks.
3) Neatly labeled suitable diagrams carry weightage

		CO	Marks
Q.1	**Answer the following (any three)**	**1**	**(15)**
a.	Describe methods to deal with missing data. Name of method:...1 explanation....3 example.....1		5
b.	What is feature selection and why is it important? definition, need justification.....1+2+3		5
c.	Describe the importance of training-test data partitioning. definition of data partition, importance, process....1+2+2		5
d.	Discuss any two Python libraries used for Machine Learning. two names, application,example...1+2+2		5
Q.2	**Answer the following (any three)**	**2**	**(18)**
a.	How does Random Forest work to prevent overfitting? definition, working, prevention 1+2+2		6
b.	Describe the working of Gradient Boosting in ensemble models. Definition, working,example....1+3+1		6

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c. Illustrate PCA with an example and explain the selection of principal components 6

Define PCA, example, selection process of principal components...1+1+4

d. Explain the working of Gaussian Naive Bayes with an example. 6

Definition, working, example....1+4+1

Q.3 Answer the following (any three) **3 (15)**

a. Describe the steps involved in backpropagation. 5

define, working, diagram...1+3+1

b. Explain the architecture of a simple perceptron with a diagram. 5

diagram, working ....2+3

c. List and discuss any two major challenges of deep neural networks, which are encountered during training and how they can be mitigated? 5

list of two cahhelnges...2 mitigation....3

d. Differentiate traditional machine learning models from Artificial Neural Networks (ANN). 5

diagrams....2 differences....3

Q.4 Answer the following (any three) **4 (15)**

a. Explain Byzantine Generals' Problem and its relevance in blockchain consensus. 5

define Byzantine Generals' Problem, Justification of relevance in blockchain..2+3

b. Discuss the working and importance of hash functions in blockchain. 5

define, working, importance...1+3+1

c. Explain Merkle Tree architecture and working with a diagram 5

Define, architecture/diagram working ..1+1+3

d. Draw & explain decentralized system with suitable diagram. 5

Definition, diagram, explanation ...1+1+3

Q.5 Answer the following (any two) **5 (12)**

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a. Discuss the advantages and challenges of using DApps in real-world applications 6

define DApps in real-world applications, advantages, challenges... 2+2+2

b. Explain the role of consensus in achieving trust in blockchain 6

Need of trust , define consensus , process of achieving trust 1+1+4

c. Discuss how blockchain addresses privacy .Explain with suitable examples. 6

definition of privacy...1 role of blockchain....4 ... example..1

Q.6 Write note on (any one) **6 (5)**

a. Blockchain technology in preventing healthcare fraud 5

BC technology, healthcare fraud, prevention..1+1+3

b. b. Overview of Cryptocurrency.

definition, flow diagram/figure, application example 1+2+1+!

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END SEMESTER EXAMINATION (SIGCE R-19 C SCHEME)

QP Code: 4571123

Subject Name : Edge and Fog Computing

Date: 30/10/2025

Subject Code: IoTCSBC702

Branch: CSE- IoT (CSBC)

Sem: VII

Duration: 3 hrs

Max Marks: 80

Note:

1) Attempt all questions
2) Assume suitable data wherever necessary.
3) Figures to the right indicate full marks

		CO	Marks
Q.1	**Answer the following:**	CO1	(15)
a.	Describe edge computing reference architecture and list it's critical components.		10
b.	Evaluate the major challenges faced in implementing Edge Computing and suggest possible solutions.		05
	(OR)		
	Analyze the challenges of maintaining data consistency and synchronization across disconnected edge nodes.		05
Q.2	**Answer the following (any two)**	CO2	(20)
a.	Evaluate the trade-offs between full virtualization, containerization, and unikernel approaches for edge computing. Analyze resource overhead, security isolation, and deployment flexibility for each approach		10
b.	Analyze the challenges of maintaining data consistency and synchronization across disconnected edge nodes. Design a conflict resolution mechanism for distributed edge databases.		10
c.	Compare AWS IoT Greengrass, Azure IoT Edge, and Google Cloud IoT Edge across the following dimensions: a) Container orchestration capabilities and Kubernetes integration b) Machine learning inference support and model deployment mechanisms c) Security features including device authentication and data encryption d) Offline operation capabilities and data synchronization strategies		10
Q.3	**Answer the following**	CO3	(15)
a.	Define task offloading in edge computing. Give an example of when an edge device would offload a task to the cloud. Also List four factors that determine whether a task should be processed locally or offloaded to the cloud.		10
b.	List three challenges of running machine learning models on resource-limited edge devices.		05
	(OR)		
	Analyze data timestamping and synchronization challenges in distributed edge computing environments.		05
Q.4	**Answer the following (any two)**	CO4	(10)
a.	Analyze scenarios where fog computing is preferred over cloud computing. Discuss bandwidth savings, latency reduction, and operational cost implications.		05
b.	Discuss data management in Fog computing.		05

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c. Explain the concept of "bringing computation closer to data sources" in fog computing with a practical example. **05**

Q.5 Answer the following (any two) **CO5** **(10)**

a. Explain the key performance evaluation metrics used in Fog computing and analyze their impact on system efficiency. **05**

b. Discuss different middleware and software platforms for Fog Computing **05**

c. Write a short note on IIoT. **05**

Q.6 Answer the following (any two) **CO6** **(10)**

a. Describe how edge computing helps in predictive maintenance for industrial equipment. Give a specific example. **05**

b. Analyze smart home applications of edge computing. How does it improve performance and security of IoT devices? **05**

c. Analyze how edge computing helps in smart grid management. Explain how it monitors energy consumption and prevents blackouts with a real-world example. **05**

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END SEMESTER EXAMINATION (SIGCE R-19 C SCHEME) QP Code: 4571142

Date: 04/11/2025

Subject Name: Enterprise IoT Cyber Security
Subject Code: IoTCSBCD7023 Branch: IoT&CSBC
Duration: 3 hours
Sem: VII
Max Marks: 80

Note:
1) Attempt all questions
2) Assume suitable data wherever necessary.
3) Figures to the right indicate full marks

		CO	Marks
Q.1	**Answer the following (any two)**	1	(14)
a.	Describe the primer on TVR - threat, vulnerability and risk.		7
b.	List out the security requirements in IoT architecture?		7
c.	Discuss the stages of the IoT device life cycle.		7
Q.2	**Answer the following**	2	(15)
a.	Write note on : i) Scrum ii) Kanban		10
b.	i) State the mitigation methods in Wannacry cyber attack on industrial control systems		5
	or		
	ii) Explain the different frameworks and methodology in Agile Development.		5
Q.3	**Answer the following (any two)**	3	(12)
a.	Write note on : i) MQTT ii) SMQTT		6
b.	What are the methods for IoT node authentication?		6
c.	Explain the importance of cryptographic controls.		6
Q.4	**Answer the following (any two)**	4	(12)
a.	What are the different authentication credentials?		6
b.	Describe the components of 802.1x.		6
c.	Explain the Oauth 2.0 authorization protocol.		6
Q.5	**write short note on (any three)**	5	(15)
a.	Challenges for IoT compliance		5
b.	(PbD) Privacy by design principles		5
c.	Privacy Engineering recommendations		5
d.	(PIA) Privacy impact assessment		5
Q.6	**Answer the following (any two)**	6	(12)
a.	Specify the cold chain management in implementation of Pfizer Covid 19 vaccine distribution .		6
b.	Discuss the application of Enterprise IoT in the cleaning service industry.		6
c.	Explain the procedure of Intelligent Iot tracking		6

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END SEMESTER EXAMINATION (SIGCE R-19 C SCHEME)

QP Code:4571152

Subject Name: Cyber Security and Laws

Date: 06/11/25

Subject Code: ILO7016 Branch: CSE IOT CSBC Sem: VII

Duration: 3 Hours Max Marks: 80

1) **Note:**
2) Attempt all questions
3) Assume suitable data wherever necessary.
   Figures to the right indicate full marks

		CO	Marks
Q.1	**Answer the following (any two)**	**CO1**	**10**
a.	Explain the role of the internet in the evolution and proliferation of cybercrime.		5
b.	How does cybercrime impact the confidentiality, integrity, and availability of information?		5
c.	Identify the challenges of addressing cybercrime on a global scale.		5
Q.2	**Answer the following (any four)**	**CO2**	**20**
a.	How can individuals and organizations defend against social engineering attacks?		5
b.	Explain the strategies for detecting and mitigating botnet threats.		5
c.	What are the new opportunities and challenges for cybercriminals with the rise of mobile and wireless devices?		5
d.	Provide examples of recent credit card fraud incidents involving mobile and wireless devices.		5
e.	Discuss how do attackers gather intelligence and conduct reconnaissance before launching a cyber attack?		5
Q.3	**Answer the following (any two)**	**CO3**	**10**
a.	Discuss the psychological tactics used by phishers to trick victims into divulging sensitive information.		5
b.	Explain the difference between a DoS attack and a DDoS attack.		5
c.	Define identity theft and explain the different methods used by cybercriminals to steal identities.		5
Q.4	**Answer the following (any two)**	**CO4**	**16**
a.	How do cyber laws address the issue of contract formation and acceptance in online transactions?		8
b.	Explain the role of international cooperation in combating cybercrime.		8
c.	Describe the concept of digital rights management (DRM) and its legal implications		8
Q.5	**Answer the following (any two)**	**CO5**	**12**
a.	How does the IT Act, 2008 amend the penalties for cyber offenses, and what are the new provisions?		6
b.	Explain the adjudication process for cybercrime cases under the IT Act, 2000.		6
c.	Describe the changes introduced by the IT Act, 2008 in the appeals process.		6

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		CO6	12
Q.6	**Answer the following (any two)**		
a.	What are the key provisions of SOX that relate to cybersecurity and information security?		6
b.	Identify the Health Insurance Portability and Accountability Act (HIPAA) and what are its main goals?		6
c.	Explain the PCI DSS and why was it established?		6

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END SEMESTER EXAMINATION (SIGCE R-19 C SCHEME) QP Code:4571131

Subject Name: Advance Cloud Computing and Security Date: 08/11/2025
Subject Code: IOTCSBCDLO7011 Branch: CSE(IOTCSBC) Sem: VII
Duration: 3 Hrs Max Marks: 80

Note:
1) **Attempt all questions**
2) **Assume suitable data wherever necessary.**
3) **Figures to the right indicate full marks.**

		CO	Marks
Q.1	**Solve any two**	CO1	(14)
a.	Discuss the key aspects of Défense in Depth		7
b.	Explain the least privilege and discuss its challenges.		7
c.	Describe the concept of Non-repudiation		7
Q.2	**Answer the following. (Any Three)**	CO2	(15)
a.	Elaborate OS Hardening and minimization		5
b.	Compare and Contrast SAST and DAST.		5
c.	Define attack vector? List out common attack vectors and explain the ways of protection		5
d.	Differentiate between Verified and measured boot.		5
Q.3	**Answer the following (Any two)**	CO3	(12)
a.	What are the essential security measures taken and best practices used for implementation of security in Virtual Data centers		6
b.	Summarize the key stages involved in developing a data retention policy for an organization		6
c.	Prepare an outline for archiving procedures for tenant data		6
Q.4	**Solve any two**	CO4	(12)
a.	Classify IAM standards and protocols.		6
b.	Write a short note on MFA and SSO.		6
c.	Explain the various phases of Lifecycle process model of IAM.		6
Q.5	**Answer the following**	CO5	(15)
a.	Design Cloud Disaster Recovery Plan for healthcare industry and build its Solution		10
b.	List out the challenges in achieving Internal Policy Compliance within a large organization		5
	OR		
c.	Discuss the important steps in the procedures of cloud disaster recovery.		5
Q.6	**Solve the following (Any two)**	CO6	(12)
a.	Breakdown the common cloud-native security tools and their functions.		6
b.	Explain 3 R's and 4 Cs of Cloud Native Security		6
c.	Elaborate the core functionalities of a Cloud-Native Application Protection Platform.		6