

Duration: 3hrs

[Max Marks: 80]

- N.B.:** (1) Question No 1 is Compulsory.  
 (2) Attempt any three questions out of the remaining five.  
 (3) All questions carry equal marks.  
 (4) Assume suitable data, if required and state it clearly.

Q1.	Attempt any four	Marks
a.	Discuss the different types of machine learning with examples	5
b.	Explain the different techniques of data pre-processing to handle the missing data in the observation.	5
c.	Explain the working of single layer perceptron.	5
d.	What is Blockchain? What are the advantages of Blockchain?	5
e.	What are Decentralized Applications? What are the challenges in Decentralized Applications?	5
<b>Q2.</b>	a. Compare and contrast PoW, PoS, PoET consensus algorithms	10
	b. What is Features scaling, Normalization and standardization in data preprocessing , illustrate with example	10
<b>Q3.</b>	a. What is Principal Component Analysis, explain with example	10
	b. Explain the concept of Nash equilibrium, using Prisoner's Dilemma	10
<b>Q4</b>	a. Compare and contrast Naive bayes, Decision Tree and Clustering	10
	b. Explain the working of AdaBoost Learning algorithm.	10
<b>Q5</b>	a. What is the Merkle Tree? How are they used in Blockchain	10
	b. Compare and contrast Bernoulli Naive Bayes, Multinomial Naive Bayes, Gaussian Naive Bayes	10
<b>Q6</b>	Write short note on (any 4)	20
	a. Privacy challenges of the blockchain	
	b. Training Neural Network with Backpropagation,	
	c. K-Means Clustering	
	d. Python packages for machine learning	
	e. Tensor Flow	

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3 Hours

80 Marks

1. Question no. 1 compulsory.
2. Answer any three questions out of remaining five
3. Attempt sub questions in order
4. Figures to the right indicate full marks.

1. Write short notes on (any 4) [20]
  - a) Capacity building
  - b) Functions of NIDM
  - c) Sea walls, embankments and bio shields
  - d) Triage
  - e) Environmental hazard
  - f) National Disaster Management Policy
  - g) Community based disaster preparedness
2. a) Discuss the framework for disaster management in India. [8]
2. b) Explain global warming and climate change. [6]
2. c) Comment on radiation hazards. Also discuss possibilities of chemical spills in Mumbai. [6]
3. a) Discuss the various types of technological disasters and highlight the specific efforts to mitigate such disasters in India. [8]
3. b) Explain the role of various international agencies for Disaster Management. [6]
3. c) Explain various means of raising finance for mitigating and managing disasters [6]
4. a) Differentiate between structural and non-structural measures of flood mitigation and discuss the importance of forecasting, warning and monitoring system in India [8]
4. b) Appraise the role of GIS and GPS in disaster management [6]
4. c) Discuss various types of natural disasters in India and highlight their impacts on life. [6]
5. a) Explain in detail the design concepts involved in as well as the construction materials used for the safe construction of facilities in case of earthquakes and cyclones. Also discuss the fire resistant facilities that need to be essentially provided in a building/industry. [8]
5. b) Elaborate the guidelines laid down by NDMA for disaster management in India. [6]
5. c) Explain in detail, vulnerability, with reference to floods and cyclones. List down the preparatory measures for minimizing vulnerabilities related to Tsunami. [6]

6. a) Discuss in brief the Disaster Management Act 2005. [6]
6. b) Explain Community based disaster preparedness [5]
6. c) Is rapid depletion of ground water a type of disaster? To which category does this belongs?  
What are the reasons for this problem? [5]
6. d) Identify and discuss the various hazards which are associated with volcanic eruptions [4]
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- 1 Attempt any FOUR [20]
- a Explain how criminals plan the attack
  - b Explain various security challenges posed by mobile devices
  - c Explain need of Cyber law in India
  - d Explain E-contracts and its different types.
  - e What are Botnets? How it is exploit by attacker to cause cyber-attack?
- 2 a Explain the classification of cybercrimes with examples. [10]
- b Explain Phishing and Identity theft in detail. [10]
- 3 a Explain different buffer overflow attacks also explain how to mitigate buffer overflow attack [10]
- b Explain electronic banking in India and what are laws related to electronic banking in India [10]
- 4 a What do you understand by DOS and DDOS attack? Explain in detail. [10]
- b Write a note on Intellectual Property Aspects in cyber law. [10]
- 5 a Explain SQL injection attack. State different countermeasure to prevent the attack. [10]
- b Explain the objectives and features of IT Act 2000 [10]
- 6 a Explain the term evidence and different types of evidences [10]
- b Write key IT requirements for SOX and HIPAA. [10]

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(2) Attempt any three questions out of the remaining five.

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**Q1. Answer the following. [20]**

- a. What are the security requirements in IoT architecture?
- b. Explain security in Agile development.
- c. Write a short note on the privacy challenges in IOT.
- d. How Lot Tracking can be done in enterprise IOT.

**Q2a. Explain IOT communication and messaging protocols [10]**

**Q2b. Explain safety and security design in IOT [10]**

**Q3a. Describe IOT security implementation and integration lifecycle [10]**

**Q3b. Explain public key infrastructure architecture for IOT [10]**

**Q4a. What do you mean by IOT compliances? Explain the IOT compliance program and the challenges associated with it. [10]**

**Q4b. Explain Identity lifecycle for an IOT device [10]**

**Q5a. How does the integration of enterprise IoT technologies contribute to enhancing global cold chain management, and what specific benefits does it offer in terms of efficiency, cost-effectiveness, and risk mitigation? [10]**

**Q5b. How is cryptographic key management done in IOT security [10]**

**Q6a. Explain attack trees with an example. State the difference between attack tree and fault tree [10]**

**Q6b. What is IoT Privacy Impact Assessment (PIA). State Privacy by Design (PbD) principles [10]**

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**(3 Hours)****[Marks: 80]****N.B.: 1) Question No. 1 is compulsory.****2) Answer any three out of remaining questions.****3) Assume suitable data if necessary.****4) Figures to the right indicate full marks.****Q1. Attempt any FOUR****20**

- (a) What is Error , Bug , Fault and Failure explain with one example
- (b) Differentiate between Manual and Automation testing
- (c) Discuss the features and use of Selenium Testing Tool.
- (d) Explain the Concept of Stress Testing.
- (e) What are the components of a test plan?

**Q2. (a) Explain the software testing Lifecycle with a neat diagram****10**

**Q2. (b) A program takes an angle as input within the range [0, 360] and determines in which quadrant the angle lies. Design test cases using equivalence class partitioning method.**

**10****Q3. (a) Explain the need for Test Automation with its selection and cost criteria.****10**

**Q3. (b) Consider the following program that reads in a string and then checks the type of each character.**

```

main()
{ char string [80];
int index;
1. printf("Enter the string for checking its characters");
2. scanf("%s", string);
3. for(index = 0; string[index] != '\0'; ++index) {
4. if((string[index] >= '0' && (string[index] <='9'
5. printf("%c is a digit", string[index]);
6. else if ((string[index] >= 'A' && string[index] <'Z')) ||
((string[index] >= 'a' && (string[index] <'z'))))
7. printf("%c is an alphabet", string[index]);
8. else
9. printf("%c is a special character", string[index]);
10. }
11. }

```

- (a) Draw the DD graph for the program.
- (b) Calculate the cyclomatic complexity of the program using all the methods.
- (c) List all independent paths.
- (d) Design test cases from independent paths.

10

Q4. (a) Explain the process of test suite prioritization techniques in detail .

10

Q4. (b) What is Mutation Testing ? Explain primary mutant with example

10

Q5. (a) Explain McCall's quality factors and Criteria.

10

Q5. (b) Explain Inspection Process of Static Testing

10

Q6. (a) Explain the process of testing web based Software.

10

Q6. (b) What is Agile testing ? Explain challenges in Agile Testing

10

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(Time: 3 Hours)

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**N.B.:** (1) Question No 1 is compulsory.

(2) Attempt any Three questions out of the remaining Five.

**Q1. Answer the following:**

[20]

- a. Explain different types of security in cloud,
- b. What are common attack vectors and threats in infrastructure security
- c. Write Short note on types of cloud disasters recovery
- d. Explain Cloud Native Security Architecture,

**Q2** a. Explain Mitigation techniques of cloud data security.

[10]

**Q2** b. What is GRC? Explain its benefits.

[10]

**Q3** a. Explain IAM Architecture in cloud.

[10]

**Q3** b. Explain Mitigation techniques in infrastructure security.

[10]

**Q4** a. Explain host level Infrastructure security.

[10]

**Q4** b. Explain implementation of security in virtual data centers.

[10]

**Q5** a. Explain in detail CIA Triad in cloud security concepts. Differentiate between Traditional vs Cloud Security.

[10]

**Q5** b. Explain data life cycle and Key Privacy Concerns in the Cloud.

[10]

**Q6** a. Explain 3 R's and 4 C's of Cloud Native Security.

[10]

**Q6** b. Describe cloud authorization management. Explain roles-based access control in cloud.

[10]

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(2) From Q2 to Q6 solve any three questions  
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Q1 Answer any four of the following [20]

- A. What are the challenges and opportunities in Fog Computing?
- B. What is the difference between virtualization and containerization?
- C. What is data timestamping in fog computing, give an example?
- D. Compare and contrast Cloud computing and Edge computing.
- E. Explain the applications of Fog computing.

Q2. [20]

- A. Explain the different Performance Evaluation and Metrics in Fog Computing.
- B. Explain the use case of Edge computing in Healthcare.

Q3. [20]

- A. Explain the Edge Computing Reference Architecture
- B. What are the different resource management strategies in edge computing

Q4 [20]

- A. What is Fog Computing? Explain Fog Computing Architecture
- B. Explain briefly about Edge computing platforms and frameworks:

Q5 [20]

- A. Explain about the Data Security and Privacy in Edge Computing.
- B. What are Challenges in Edge Caching and Data Synchronization?

Q6. Write short note [Any 2] [20]

- A. Industrial IoT and edge computing
- B. Data Management in Fog Computing
- C. Task offloading strategies in Edge Computing

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