

Duration: 3 hours

Max. Marks: 80

N.B.: 1) Question No.1 is compulsory.**2) Attempt any THREE questions out of remaining FIVE questions.****3) Figures to the right indicates full marks.****4) Assume suitable data if necessary.**

- Q1** **20**
- a What is Cybercrime? Who are Cybercriminals? Explain.
 - b How Cybercrimes differs from most terrestrial crimes?
 - c What are different Security Risks for Organizations?
 - d Outline the challenges for securing data in business perspective.
- Q.2**
- a What are illegal activities observed in Cyber Cafe? What are safety and security measures while using the computer in Cyber Cafe? **10**
 - b What is digital evidence? Where one can find it. **10**
- Q.3**
- a Explain different types of Cybercrimes. **10**
 - b What are basic security precautions to be taken to safeguard Laptops and Wireless devices? Explain. **10**
- Q.4**
- a Explain Steps for SQL Injection attack. How to prevent SQL Injection attacks? **10**
 - b Discuss steps involved in planning of cyberattacks by criminal. **10**
- Q.5**
- a What is vishing attack? How it works? How to protect from vishing attack? **10**
 - b What is e-commerce? Discuss types of e-commerce. **10**
- Q.6 Write short notes on any FOUR** **20**
- a Cyberstalking and harassment
 - b HIPAA
 - c Buffer overflow attack
 - d Botnets
 - e DOS attack
 - f Mobile/Cell Phone attacks
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- (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.

- 1 Attempt any four [20]
- a) Comment on the Representation Power of MLPs.
 - b) Explain Gradient Descent in Deep Learning.
 - c) Explain the dropout method and its advantages.
 - d) What are Denoising Autoencoders?
 - e) Explain Pooling operation in CNN.
- 2 a) What are the Three Classes of Deep Learning , explain each? [10]
- b) Explain and analyze the architectural of AlexNet Convolution Neural Network. [10]
- 3 a) What are the different types of Gradient Descent methods, explain any three of them. [10]
- b) Differentiate between the architecture of LSTM and GRU network. [10]
- 4 a) Explain the key components of an RNN. [10]
- b) Consider a CNN layer with the following configuration: [10]
- The input to the layer has 32 channels and a spatial size of 64x64.
 - The convolutional layer has 64 filters (kernels), each of size 3x3, with a stride of 1 and no padding.
 - Each filter is applied to every channel of the input.
- Calculate the total number of parameters (weights) in this convolutional layer.
- 5 a) Comment on the significance of Loss functions and explain different types of Loss functions while training a network. [10]
- b) Explain any three types of Autoencoders. [10]
- 6 a) What is the significance of Activation Functions in Neural Networks, explain different types Activation functions used in NN. [10]
- b) Explain Generative Adversarial Networks Architecture and its applications. [10]

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1. Attempt any **FOUR** **[20]**
 - a. What are technical measures of Information Security
 - b. Explain concept of Identification, Authentication.
 - c. Illustrate various XSS attacks.
 - d. Explain benefits of Cloud computing
 - e. List down various Malwares and describe anyone.
 2. a. Illustrate an Overview of Certifiable Standards in (How, What, When, Who).term. **[10]**
b. Compare Intrusion Detection System (IDS) and Intrusion Prevention System (IPS). **[10]**
 3. a. Explain how availability is calculated including metrics such as Mean Time Between Failure (MTBF) and Mean Time to Repair (MTTR). **[10]**
b. Describe OCTAVE: Risk Assessment Framework along with its benefits. **[10]**
 4. a. Describe various Disaster Recovery Techniques. **[10]**
b. How are access control methods categorized into administrative, physical, technical and the layering of access control? **[10]**
 5. a. Compare the quantitative and qualitative risk assessment approaches. **[10]**
b. Explain Open Web Application Security Project (OWASP) and identify the common issues in Web Apps. **[10]**
 6. a. What are the key characteristics of NIST risk assessment framework? **[10]**
b. What are the objectives of IT ACT? Explain in detail IT ACT 2000 and IT ACT 2008. **[10]**
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 3. Assume suitable data if necessary and justify the assumptions
 4. Figures to the right indicate full marks

- Q1 Answer the Following. 20
- A Explain open and closed word classes in English Language. Show how the tags are assigned to the words of following sentence: 05
 "He used to provide help to other people"
- B Discuss Information Retrieval vs Information Extraction in detail 05
- C Define Discourse & Pragmatic analysis. 05
- D What do you mean by word sense disambiguation (WSD)? 05
- Q2 A What is language model? Write a note on N-gram model. 10
- B Explain Porter's Stemming algorithm with example. 10
- Q3 A Explain with suitable example following relationships between word meanings: Homonymy, Polysemy, Synonymy, Antonymy, Hypernymy, Hyponymy, Meronymy. 10
- B What is Natural language processing (NLP)? Discuss various stages involved in NLP process with suitable example. 10
- Q4 A Discuss reference resolution problem in detail. 10
- B What do you mean by ambiguity in natural Language? Explain its types and ways to resolve it with suitable example 10
- Q5 A Explain Lesk's algorithm in detail. 10
- B Discuss the following potential problems in CFG such as 1) Agreement 2) Sub categorization 3) Movement 10
- Q6 Write Short Notes.(5 marks each) 20
- Text Summarization
 - Named Entity Resolution
 - Machine Translation
 - Question Answering System

(Time: 3 HOURS)

(MAX. MARKS : 80)

Note:

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2. Attempt any three questions out of remaining five questions.
3. Assume suitable data wherever necessary.
4. Figures to right indicate full marks.

- Q.1 Answer the following (Any four)
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| a. Define Blockchain. Explain the Data structure used in blockchain. | 05 |
| b. Explain Genesis block in detail. | 05 |
| c. Write a note on Mining Difficulty. | 05 |
| d. Explain the key characteristics of private Blockchain | 05 |
| e. Explain different types of cryptocurrency. | 05 |
| f. Explain applications of blockchain in supplychain. | 05 |
- Q.2
- | | |
|---|----|
| a. List and explain various types of consensus mechanisms in brief. | 10 |
| b. Explain various components of ethereum. | 10 |
- Q.3
- | | |
|---|----|
| a. What is the UTXO model? How can the double spending problem be solved in bitcoin Blockchain? | 10 |
| b. Explain Hyperledger fabric architecture in detail. | 10 |
- Q.4
- | | |
|--|----|
| a. Explain the ERC20, ERC721, ICO and STO in detail. | 10 |
| b. Explain Corda architecture. Compare it with quorum. | 10 |
- Q.5
- | | |
|---|----|
| a. Illustrate a case study on consortium blockchain. Give its architecture. | 10 |
| b. Explain merkle tree in detail. | 10 |
- Q.6
- | | |
|--|----|
| a. Explain transaction lifecycle with respect to private blockchain. | 10 |
| b. Explain different types of wallets in detail. | 10 |
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- Note: 1. Question 1 is compulsory
2. Answer any three out of the remaining five questions.
3. Assume any suitable data wherever required and justify the same.

- Q.1 (a) Explain 5 V's of big data. 05
(b) Differentiate between SQL vs NoSQL 05
(c) Write the limitations of Hadoop. 05
(d) Explain how failures are handled in Map Reduce job 05
- Q.2 (a) Illustrate relational algebra operations with example. 10
(b) Explain big data enabling technologies. 10
- Q.3 (a) Explain PCY algorithm and its types with neat labeled diagram 10
(b) Compare different types of NoSQL architectural pattern 10
- Q.4 (a) Explain Hadoop Architectural Model with both components in detail 10
(b) Write the functions of the components and execution steps in Map Reduce 10
- Q.5 (a) Write issues in data stream queries. Explain the issues in data streaming 10
(b) Explain Page rank using Map reduce, also explain spider traps and dead ends 10
- Q.6 (a) Explain CURE algorithm with its advantages over traditional clustering algorithm 10
(b) Explain Movie recommendation using Collaborative -based filtering. 10
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