

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. Solve any **four** from following. [20]

- a. What are the issues in Machine learning?
- b. Explain Regression line, Scatter plot, Error in prediction and Best fitting line.
- c. Explain the concept of margin and support vector.
- d. Explain the distance metrics used in clustering.
- e. Explain Logistic Regression

Q2. a. Explain the steps of developing Machine Learning applications. [10]

b. Explain Linear regression along with an example. [10]

Q3. a. Create a decision tree using Gini Index to classify following dataset. [10]

Sr. No.	Income	Age	Own Car
1	Very High	Young	Yes
2	High	Medium	Yes
3	Low	Young	No
4	High	Medium	Yes
5	Very High	Medium	Yes
6	Medium	Young	Yes
7	High	Old	Yes
8	Medium	Medium	No
9	Low	Medium	No
10	Low	Old	No
11	High	Young	Yes
12	Medium	Old	No

b. Describe Multiclass classification. [10]

Q4. a. Explain the Random Forest algorithm in detail. [10]

b. Explain the different ways to combine the classifiers. [10]

Q5. a. Compute the Linear Discriminant projection for the following two-dimensional [10]

dataset.  $X_1 = (x_1, x_2) = \{(4,1), (2,4), (2,3), (3,6), (4,4)\}$  and

$X_2 = (x_1, x_2) = \{(9,10), (6,8), (9,5), (8,7), (10,8)\}$

b. Explain EM algorithm. [10]

Q6. Write detailed note on following. (**Any two**) [20]

- a. Performance Metrics for Classification
- b. Principal Component Analysis for Dimension Reduction
- c. DBSCAN

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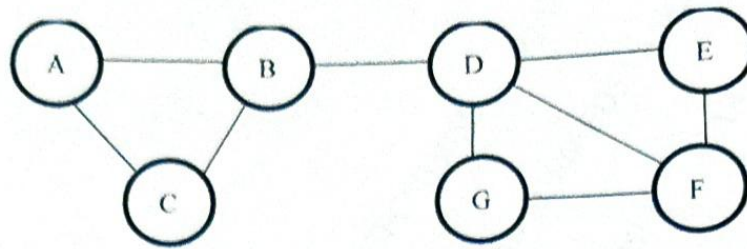
**Time: 03 Hours**

**Marks: 80**

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.

- Q1 a) What is function of Map Tasks in the Map Reduce framework? Explain with the help of an example. [5]
- b) Demonstrate how business problems have been successfully solved faster, cheaper and more effectively considering NoSQL Google's MapReduce case study. Also illustrate the business drivers and the findings in it. [5]
- c) Why is HDFS more suited for applications having large datasets and not when there are small files? Elaborate. [5]
- d) Explain the concept of bloom filter with an example [5]
- Q2 a) Name the three ways that resources can be shared between computer systems. Name the architecture used in big data solutions and describe it in detail. [10]
- b) Write a map reduce pseudo code for word count problem. Apply map reduce working on the following document: [10]
- "This is an apple. Apple is red in color".
- Q3 a) Suppose the stream is 1, 3, 2, 1, 2, 3, 4, 3, 1, 2, 3, 1. Let  $h(x) = 6x + 1 \pmod{5}$ . Show how the Flajolet- Martin algorithm will estimate the number of distinct elements in this stream. [10]
- b) Consider the following data frame given below: [10]
- | subject | class | marks |
|---------|-------|-------|
| 1       | 1     | 56    |
| 2       | 2     | 75    |
| 3       | 1     | 48    |
| 4       | 2     | 69    |
| 5       | 1     | 84    |
| 6       | 2     | 53    |
- i. Create a subset of subject less than 4 by using subset () function and demonstrate the output.
- ii. Create a subset where the subject column is less than 3 and the class equals to 2 by using [ ] brackets and demonstrate the output.
- a) What are the Core Hadoop components? Explain in detail. [10]
- b) With a neat sketch, explain the architecture of the data-stream management system. [10]
- Q5 a) Determine communities for the given social network graph using Girvan- Newman algorithm. [10]



- b) The data analyst of Argon technology Mr. John needs to enter the salaries of 10 employees in R. The salaries of the employees are given in the following table: [10]

Sr. No.	Name of employees	Salaries
1	Vivek	21000
2	Karan	55000
3	James	67000
4	Soham	50000
5	Renu	54000
6	Farah	40000
7	Hetal	30000
8	Mary	70000
9	Ganesh	20000
10	Krish	15000

- Which R command will Mr. John use to enter these values demonstrate the output.
- Now Mr. John wants to add the salaries of 5 new employees in the existing table, which command he will use to join datasets with new values in R. Demonstrate the output.

- Q6 a) i. Write the script to sort the values contained in the following vector in ascending order and descending order: (23, 45, 10, 34, 89, 20, 67, 99). Demonstrate the output. [10]
- ii. Name and explain the operators used to form data subsets in R.
- b) How recommendation is done based on properties of product? Elaborate with a suitable example. [10]

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**Time: 3 Hours**

**Max. Marks: 80**

- N.B. (1) Question No. 1 is compulsory  
 (2) Assume suitable data if necessary  
 (3) Attempt any three questions from remaining questions

- |               |                                                                                                                        |              |
|---------------|------------------------------------------------------------------------------------------------------------------------|--------------|
| <b>Q.1</b>    | Any Four                                                                                                               | <b>20[M]</b> |
| <b>a</b>      | Differentiate between Syntactic ambiguity and Lexical Ambiguity.                                                       | <b>[5M]</b>  |
| <b>b</b>      | Define affixes. Explain the types of affixes.                                                                          | <b>[5M]</b>  |
| <b>c</b>      | Describe open class words and closed class words in English with examples.                                             | <b>[5M]</b>  |
| <b>d</b>      | What is rule base machine translation?                                                                                 | <b>[5M]</b>  |
| <b>e</b>      | Explain with suitable example following relationships between word meanings.<br>Homonymy, Polysemy, Synonymy, Antonymy | <b>[5M]</b>  |
| <b>f</b>      | Explain perplexity of any language model.                                                                              | <b>[5M]</b>  |
| <br>          |                                                                                                                        |              |
| <b>Q.2 a)</b> | Explain the role of FSA in morphological analysis?                                                                     |              |
| <b>Q.2 b)</b> | Explain Different stage involved in NLP process with suitable example.                                                 | <b>[10M]</b> |
| <br>          |                                                                                                                        |              |
| <b>Q.3 a)</b> | Consider the following corpus                                                                                          | <b>[5M]</b>  |
|               | <s> I tell you to sleep and rest </s>                                                                                  |              |
|               | <s> I would like to sleep for an hour </s>                                                                             |              |
|               | <s> Sleep helps one to relax </s>                                                                                      |              |
|               | List all possible bigrams. Compute conditional probabilities and predict the next word for the word "to".              |              |
| <b>Q.3 b)</b> | Explain Yarowsky bootstrapping approach of semi supervised learning                                                    | <b>[5M]</b>  |
| <b>Q.3 c)</b> | What is POS tagging? Discuss various challenges faced by POS tagging.                                                  | <b>[10M]</b> |
| <br>          |                                                                                                                        |              |
| <b>Q.4 a)</b> | What are the limitations of Hidden Markov Model?                                                                       | <b>[5M]</b>  |
| <b>Q.4 b)</b> | Explain the different steps in text processing for Information Retrieval                                               | <b>[5M]</b>  |
| <b>Q.4 c)</b> | Compare top-down and bottom-up approach of parsing with example.                                                       | <b>[10M]</b> |
| <br>          |                                                                                                                        |              |
| <b>Q.5 a)</b> | What do you mean by word sense disambiguation (WSD)? Discuss dictionary based approach for WSD.                        | <b>[10M]</b> |
| <b>Q.5 b)</b> | Explain Hobbs algorithm for pronoun resolution.                                                                        | <b>[10M]</b> |
| <br>          |                                                                                                                        |              |
| <b>Q.6 a)</b> | Explain Text summarization in detail.                                                                                  | <b>[10M]</b> |
| <b>Q.6 b)</b> | Explain Porter Stemming algorithm in detail                                                                            | <b>[10M]</b> |

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(3 Hours)

(Total Marks: 80)

- N.B.:** 1. Question No. 1 is compulsory.  
2. Answer any three out of the remaining questions.  
3. Assume suitable data if necessary.  
4. Figures to the right indicate full marks.

- Q1. Attempt the following (any 4):** (20)
- a. Define blockchain? Compare different types of blockchain.
  - b. What is a smart contract? How crowdfunding platforms can be managed using smart contracts?
  - c. What is a backup in Practical Byzantine Fault Tolerance (PBFT) algorithm?
  - d. What is a Merkle tree? Explain the structure of a Merkle tree.
  - e. Write a program in solidity to check whether a number is prime or not.
- Q2. Attempt the following:**
- a. State and explain various challenges that occur while implementing blockchain. (10)
  - b. What is a double spending problem? How PoW solves the problem of double spending? (10)
- Q3. Attempt the following:**
- a. Compare Bitcoin and Ethereum. How to calculate Mining difficulty in bitcoin (10)
  - b. Explain Hyperledger Fabric v1 architecture. (10)
- Q4. Attempt the following:**
- a. Describe the architecture of Ethereum. (10)
  - b. Write a program in solidity to implement multi-level inheritance. (10)
- Q5. Attempt the following:**
- a. Explain PAXOS consensus algorithm for a private blockchain. (10)
  - b. Explain fixed and dynamic arrays in solidity with suitable examples. (10)
- Q6. Write short notes on (any 2):** (20)
- a. Corda
  - b. UTXO model of Bitcoin
  - c. Quorum
  - d. Fallback function in Solidity

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(3 Hours)

Total Marks: 80

Note:

1. Question No. 1 is compulsory.
2. Attempt any THREE out of the remaining FIVE questions.
3. Assume suitable data if necessary.

- |   |                                                                                                    |      |
|---|----------------------------------------------------------------------------------------------------|------|
| 1 | Answer the following (any 4)                                                                       | (20) |
|   | a) Define the terms: Hazard, Vulnerability, Risk                                                   | 5    |
|   | b) Discuss the Direct and indirect effects of disasters                                            | 5    |
|   | c) What is Disaster Scenario of India?                                                             | 5    |
|   | d) Explain types of Manmade disasters.                                                             | 5    |
|   | e) What is Climate Change? What are the effects of Global Warming?                                 | 5    |
| 2 | a) What are different types of flood? Enlist structural mitigation measures for flood.             | 10   |
|   | b) Explain the types of landslide and factors affecting them. Give a case study for the same.      | 10   |
| 3 | a) What are different government agencies responsible for various types of disasters?              | 10   |
|   | b) Explain roles and responsibilities of NDMA in detail.                                           | 10   |
| 4 | a) Discuss the role of GIS and Remote Sensing in disaster management.                              | 10   |
|   | b) Describe the institutional mechanism setup in India.                                            | 10   |
| 5 | a) What is role of NGOs in disaster management? Enlist major NGOs working on disaster management.  | 10   |
|   | b) Explain Bio shield and Sea wall in detail with schematic diagram.                               | 10   |
| 6 | a) What is Community Base Disaster Management (CBDM)? Discuss how it is useful in Indian scenario. | 10   |
|   | b) What are Do's and don'ts in Earthquake, Tsunami and Cyclone?                                    | 10   |

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## Paper / Subject Code: 42181 / Management Information Systems

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.

- 1 Attempt any **FOUR** [20]  
a What are the different types of MIS? [05]  
b How is data governance achieved in case of MIS? [05]  
c Analyse briefly to highlight the difference between Web 2.0 and Web 3.0? [05]  
d Evaluate the MIS Hierarchy to comment on Decision Support System. [05]  
e List the main difference between Wireless and Wired Technologies? [05]
- 2 a Give an understanding on types of Control to achieve Security. [10]  
b What is Mobile Commerce? What are the new challenges that it has introduced in business? [10]
- 3 a What do you mean by CRM? Give its types and relate the role of SC on CRM. [10]  
b What is Data Mart and Data Warehouses? Give two examples which show generation of Big Data. [10]
- 4 a Write short notes on (1) TPS (2) ERP [10]  
b Evaluate the role of Confidentiality, Integrity and Availability in order to achieve security. [10]
- 5 a What is the need of Social Computing for Businesses? [10]  
b Create MIS system for any hospital. [10]
- 6 a What is Big Data? What are the various challenges and characteristics of Big Data? [10]  
b Describe various Cloud Computing Models and highlight their evolution. [10]

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- 1 Attempt any FOUR [20]
- a Differentiate between cybercrime and cyber fraud.
  - b Explain various threats associated with cloud computing.
  - c Explain methods of password cracking
  - d Explain E-contracts and its different types.
  - e Explain different attack vectors in cyber security
- 2 a Explain the classification of cybercrimes with examples. [10]  
b Explain various types of credit card frauds [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 the objectives and features of IT Act 2000 [10]  
b What are Botnets? How it is exploit by attacker to cause cyber attack? [10]
- 6 a Explain SQL injection attack. State different countermeasure to prevent the attack. [10]  
b Explain what is Information Security Standard and Explain HIPAA act in detail [10]

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