**1. Passing Mark (32)**

1. Write down and explain Types of Machine Learning.
2. What are the Issues in Machine Learning?
3. Write down Application of Machine Learning
4. Explain in detail Steps in developing a Machine Learning Application.
5. Explain in detail Training Error and Generalization error.
6. Explain in detail Bias-Variance trade-off.
7. Write a short note on Linear Regression.
8. Explain in detail Multivariate Linear Regression.
9. Write a short note on Logistic Regression.
10. Explain in detail Decision Trees.
11. Constructing Decision Trees using Gini Index (Regression)
12. Differentiate Classification and Regression Trees (CART)
13. Write a short note on Confusion Matrix, [Kappa Statistics], Sensitivity, Specificity, Precision
14. Write a short note on ROC curve
15. Explain in detail Understanding Ensembles
16. Discuss in detail K-fold cross-validation

17. What are Different ways to combine classifiers
18. Explain Support Vector Machine Constrained Optimization.
19. Write a short note on Margins and support vectors
20. Explain in detail SVM as a constrained optimisation problem
21. Describe Quadratic Programming
22. Discuss SVM for linear and nonlinear classification
23. Explain in detail Graph-Based Clustering.
24. Discuss Clustering with minimal spanning trees.
25. Explain Expectation-Maximization Algorithm.
26. Describe Density-Based Clustering DBSCAN

27. Discuss in detail Dimensionality Reduction Techniques.
28. Describe Principal Component Analysis.
29. Write a short note on Linear Discriminant Analysis.
30. Discuss in detail Singular Value Decomposition.

13. Write a short note on Confusion Matrix, [Kappa Statistics], Sensitivity, Specificity, Precision
14. Write a short note on ROC curve
15. Explain in detail Understanding Ensembles
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**3. Above (45 Marks)**

1. Write down and explain Types of Machine Learning.
2. What are the Issues in Machine Learning?
3. Write down Application of Machine Learning
4. Explain in detail Steps in developing a Machine Learning Application.
5. Explain in detail Training Error and Generalization

**1. Passing Mark (32)**

1. Write down Big Data characteristics and Types of Big Data.
2. Difference between Traditional vs. Big Data business approach.
3. Write a short note on Hadoop.
4. Explain Hadoop Ecosystem.
5. Write a short note on Grouping by Key.
6. Discuss Matrix-Vector Multiplication by MapReduce
7. Discuss Computing Projections by MapReduce, Union, Intersection, and Difference by MapReduce.
8. Write a short note on Hadoop Limitations.
9. Discuss Variations of NoSQL architectural patterns.
10. Write down a NoSQL solution for big data.
11. Analyzing big data with a shared-nothing architecture.
12. Explain in detail Master-slave versus peer-to-peer
13. Describe NoSQL systems to handle big data problems.
14. What are the Issues in Stream Processing.
15. Discuss Sampling Data techniques in a Stream

problems.

14. What are the Issues in Stream Processing.
15. Discuss Sampling Data techniques in a Stream
16. Explain Bloom Filter with Analysis.
17. Explain in detail Count-Distinct Problem
18. Discuss in detail Flajolet-Martin Algorithm
19. Explain The Datar-Gionis-Indyk-Motwani Algorithm
20. Discuss Query Answering in the DGIM algorithm.
21. Discuss in detail Collaborative Filtering.
22. Write a short note on Product Recommendation.
23. Direct Discovery of Communities in a social graph.
24. Exploring Basic features of R, Exploring RGUI, Exploring RStudio.

**3. Above (45 Marks)**

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22. Write a short note on Product Recommendation.
23. Direct Discovery of Communities in a social graph.
24. Exploring Basic features of R, Exploring RGUI, Exploring RStudio.
25. Handling Basic Expressions in R, Variables in R, Working with Vectors, Storing and Calculating Values in R.
26. Explain Handling data in the R workspace
27. Discuss in detail Executing Scripts and Creating Plots.
28. Explain Reading datasets and Exporting data from R.
29. Explain Manipulating and Processing Data in R
30. Explain in detail Data Visualization Types and Applications.

**1. Passing Mark (32)**

1. Discuss Knowledge and Grammar in language processing
2. Write down Challenges and Applications of NLP.
3. Discuss Variety of types of tools for regional languages pre-processing and other functionalities
4. Explain Lexicon free FST Porter Stemmer algorithm
5. Describe N-gram Sensitivity to the Training Corpus
6. Discuss Unknown Words like Open versus closed vocabulary tasks
7. Explain in detail Evaluating N-grams
8. Explain in detail Good-Turing Discounting
9. Write a short note on Noisy channel models
10. Explain in detail Advance Issues in Language Modeling.
11. Discuss Difficulties /Challenges in POS tagging
12. Write a short note on Hidden Markov
13. Explain in detail Model (HMM Viterbi) for POS tagging
14. Short note on Discriminative Model.
15. Write a short note on Maximum Entropy model
16. Explain in detail Conditional random Field (CRF)

tagging

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15. Write a short note on Maximum Entropy model
16. Explain in detail Conditional random Field (CRF)
17. Explain in detail Parsers are Top down and Bottom up
18. Explain in detail Bottom Up Parser like CYK and PCFG (Probabilistic Context Free Grammar)
19. Write a short note on Shift Reduce Parser
20. Explain in detail Parsers based language modeling
21. Write a short note on Lexical Semantics.
22. Explain in detail Study of Various language dictionaries like WorldNet, Babelnet
23. Explain in detail Word Sense Disambiguation (WSD)

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23. Explain in detail Word Sense Disambiguation (WSD)
24. Explain in detail Knowledge based approach(Lesk's Algorithm)
25. Explain in detail Semi-supervised method (Yarowsky) Unsupervised (Hyperlex)
26. Explain in detail Dictionaries for regional languages
27. Explain in detail Anaphora Resolution using Hobbs and Cantering Algorithm.
28. Write a short note on Discourse segmentation
29. Write a short note on Conference resolution
30. Write a short note on Sentiment analysis Neural Network with NLP such as LSTM network.

1. **Passing Mark (32)**
    1. Discuss in detail Information Versus Data
    2. Explain Trends and research issues in information retrieval.
    3. Write a short note on the retrieval process.
    4. Describe Information retrieval in the library, web and digital libraries.
    5. Describe Taxonomy of Information Retrieval models
    6. Explain in detail Classic Information Retrieval
    7. Write a short note on Theoretical model
    8. Describe in detail Alternative Algebraic models and Alternative Probabilistic models
    9. Write a short note on Query structures
    10. Write a short note on Pattern matching
    11. Difference between Automatic local analysis vs Automatic global analysis
    12. Explain in detail Multimedia Information Retrieval
    13. Explain in detail Distributed Information Retrieval

2. **Average Between (32-45 Marks)**
    1. Discuss in detail Information Versus Data
    2. Explain Trends and research issues in information retrieval.
    3. Write a short note on the retrieval process.

10. Write a short note on Pattern matching
11. Difference between Automatic local analysis vs Automatic global analysis
12. Explain in detail Multimedia Information Retrieval
13. Explain in detail Distributed Information Retrieval
14. Discuss Information retrieval system evaluation
15. Discuss Evaluation of unranked retrieval sets
16. Discuss Evaluation of ranked retrieval results
17. Describe Assessing and justifying the concept of relevance
18. Explain in detail System quality and user utility
19. Write a short note on System issues
20. Explain Refining a deployed system.

3. **Above (45 Marks)**
   1. Discuss in detail Information Versus Data
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   3. Write a short note on the retrieval process.
   4. Describe Information retrieval in the library, web and digital libraries.
   5. Describe Taxonomy of Information Retrieval models
   6. Explain in detail Classic Information Retrieval
   7. Write a short note on Theoretical model

relevance

18. Explain in detail System quality and user utility
19. Write a short note on System issues
20. Explain Refining a deployed system.

21. Explain Boolean queries and Sequential searching
22. Describe in detail Parametric and zone indexes
23. Write a short note on Learning weight and optimal weight
24. Explain in detail Tf-IDF weighting.
25. Describe The vector space model for scoring
26. Explain Inexact top K document retrieval

1. Passing Mark (32)
    1. List the types of Information system? Explain in brief - Module no.1 | (10M)
    2. Discuss competitive advantage achieved in Information System - Module no.1 | (10M)
    3. Explain the architecture of Data mart and Data warehouse in an organization. - Module no.2 (10M)
    4. Discuss the Impact of BI on Decision Making. - Module no.2 | (10M)
    5. What are the potential benefits of social commerce to the customers and to the business? - Module no.4 | (10M)
    6. What are major security threats to the information system? Discuss the measures taken to control information security. - Module no.3 | (10M)
    7. Discuss the significance of social computing in marketing in detail. - Module no.4 | (10M)
    8. What are the functional areas of the Information system? Explain in detail. - Module no.1 | (10M)
    9. Define CRM. Describe the different types of CRM. - Module no.4 | (10M)

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10. Design MIS for the Educational System. - Module no.6 | (10M)
11. What is an information system? Explain the necessary element with a neat diagram. - Module no.1 | (5M)
12. Define Big Data and discuss its basic characteristics? - Module no.2 | (5M)
13. Explain the Ethical issues and threats of information security? - Module no.3 | (5M)
14. Describe how social computing inspires customer service - Module no.4 | (5M)
15. Differentiate between computer network wired and wireless technology - Module no.5 | (5M)

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14. Describe how social computing inspires customer service - Module no.4 | (5M)
15. Differentiate between computer network wired and wireless technology - Module no.5 | (5M)
16. Importance of security for ERP systems. - Module no.3 | (5M)
17. Define Lead time and Cycle time. - Module no.6 | (5M)
18. What are the different phases of the ERP implementation lifecycle? - Module no.6 | (10M)
19. What is business modeling? - Module no.2 | (5M)
20. E-commerce - Module no.4 | (5M)