Paper / Subject Code: 42179 / Institute Level Optional Course-I :-Product Life Cycle Management

B.E/ Sem-VII / Comp / May-2024

Date:-14/06/2024

**Duration: 3 Hours**

**Maximum Marks: 80**

N.B.: -

1. Question No 1 is Compulsory
2. Solve any three questions from remaining questions
3. Assume suitable data if required and mention it clearly
4. Figures to right indicate full marks

| Q1 | | Solve any four of following | |
|---|---|---|---|
| | [A] | With respect to Product Life Cycle Management explain opportunities to Globalization. | 5 |
| | [B] | Explain concept of organization and decomposition in Product design | 5 |
| | [C] | Explain importance of Product Data Management System | 5 |
| | [D] | Explain need for life cycle environmental strategies. | 5 |
| | [E] | How will you develop PLM vision and PLM Strategy | 5 |

| Q2 | [A] | Explain useful life extension strategies with suitable example | 10 |
|---|---|---|---|
| | [B] | Explain general framework for LCCA | 10 |

| Q3 | [A] | Explain various barriers to PDM implementation | 10 |
|---|---|---|---|
| | [B] | Explain concept of digital mock-up in detail | 10 |

| Q4 | [A] | Provide financial justification for PDM implementation | 10 |
|---|---|---|---|
| | [B] | Explain phases of LCA in ISO standards | 10 |

| Q5 | [A] | What do you mean by design for X? Explain choice of Design for X tools and their use in design process | 10 |
|---|---|---|---|
| | [B] | Explain various Product Life Cycle phases with suitable example | 10 |

| Q6 | | Write short notes on:- | |
|---|---|---|---|
| | [A] | Concurrent Engineering | 10 |
| | [B] | Modelling and Simulation in Product Design | 10 |

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Paper / Subject Code: 42177 / BLOCK CHAIN (DLOC - IV)

B·E / Sem-VIII / Computer / May-2024

(3 Hours)

Date:- 12/06/2024

(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. Explain Gas and Ethers in detail.

   b. What is the fundamental difference between a hot wallet and a cold wallet in the context of blockchain and cryptocurrency storage?

   c. Explain the concept of an orphaned block.

   d. Describe how solidity supports multiple inheritance with an example.

   e. Compare Bitcoin and Ethereum.

**Q2.** Attempt the following:

   a. Differentiate between public, private and consortium blockchain. (10)

   b. Differentiate between PoW, PoS, PoB & PoET. (10)

**Q3.** Attempt the following:

   a. Explain Merkle Tree with the help of an example. (10)

   b. What is mining difficulty and how is it calculated in a proof-of-work? Explain with an example. (10)

**Q4.** Attempt the following:

   a. Write and elaborate a code in solidity to explain visibility and activity qualifiers. (10)

   b. Explain view function and pure function in solidity with suitable examples. (10)

**Q5.** Attempt the following:

   a. Explain state machine replication with suitable example. (10)

   b. Explain RAFT consensus algorithm with a suitable example. (10)

**Q6.** Write short notes on (any 2): (20)

   a. Role of smart contracts in decentralized finance (DeFi)

   b. Ripple

   c. Ethereum Virtual Machine (EVM)

   d. Mining pool and its methods

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**Paper / Subject Code: 42175 / NATURAL LANGUAGE PROCESSING (DLOC - III)**

BE/ Sem-VII/ Computer/ May-2024          Date - 10/06/2024

**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.

Q1a) Explain the applications of Natural Language processing.                          5M

Q1b) Illustrate the concept of tokenization and stemming in Natural Language processing.  5M

Q1c) Discuss the challenges in part of speech tagging.                                  5M

Q1d) Describe the semantic analysis in Natural Language processing.                     5M

Q2a) Explain inflectional and derivational morphology with an example                  10M

Q2b) Illustrate the working of Porter stemmer algorithm                                10M

Q3a) Explain hidden markov model for POS based tagging.                                10M

Q3b) Demonstrate the concept of conditional Random field in NLP                        10M

Q4a) Explain the Lesk algorithm for Word Sense Disambiguation.                         10M

Q4b) Demonstrate lexical semantic analysis using an example                            10M

Q5a) Illustrate the reference phenomena for solving the pronoun problem                10M

Q5b) Explain Anaphora Resolution using Hobbs and Cantering Algorithm                   10M

Q6a) Demonstrate the working of machine translation systems                            10M

Q6b) Explain the Information retrieval system                                          10M

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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) | Explain how big data problems are handled by Hadoop system. | [5] |
| | b) | Mention four characteristics of big data and explain in detail. | [5] |
| | c) | List and explain the core business drivers behind the NoSQL movement. | [5] |
| | d) | Explain the concept of bloom filter with an example. | [5] |

Q2 a) What is graph store? Give an example where a graph store can be used to effectively [10] solve a particular business problem.

b) Write a map reduce pseudo code for word count problem. Illustrate with an example [10] showing all the steps.

Q3 a) Suppose the stream is S = {4, 2, 5 ,9, 1, 6, 3, 7}. Let hash functions h(x) = 3x + [10] 7mod 32 for some a and b, treat result as a 5-bit binary integer. Show how the Flajolet- Martin algorithm will estimate the number of distinct elements in this stream.

b) Describe applications of data visualization. [10]

Q4 a) Explain selection and projection relational algebraic operation using MapReduce. [10]

b) Explain DGIM algorithm for counting ones in a stream with example. [10]

Q5 a) Determine communities for the given social network graph using Girvan- Newman [10] algorithm.

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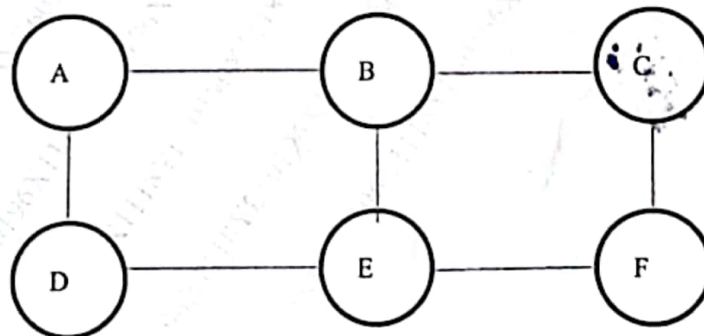
b) Consider the following data frame given below: [10]

| | | | |
|---|---|---|---|
| 1 | 11 | 1 | 56 |
| 2 | 12 | 2 | 75 |
| 3 | 13 | 1 | 48 |
| 4 | 14 | 2 | 69 |
| 5 | 15 | 1 | 84 |
| 6 | 16 | 2 | 53 |

i. Create a subset of course less than 5 by using [ ] brackets and demonstrate the output.
ii. Create a subset where the course column is less than 4 or the class equals to 1 by using subset () function and demonstrate the output.

Q6 a) i. Write a script to create a dataset named data1 in R containing the following text. [10]

Text: 2, 3, 4, 5, 6.7, 7, 8.1, 9

ii. Explain the various functions provided by R to combine different sets of data.

b) Describe collaborative filtering in recommendation system. [10]

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Paper / Subject Code: 42171 / MACHINE LEARNING

BE/Comp/Sem-VII/June.2024
04/06/24

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** from the following                                    [20]

A Explain any five business applications of Machine learning.

B What is dimensionality reduction? Explain how it can be utilized for classification and clustering task in Machine learning.

C Explain performance evaluation metrics for binary classification with suitable example.

D Explain Gini index along with an example.

E Explain the concept of k fold cross validation.

**Q2** A Write a short note on issues in Machine Learning.                          [10]

B Compare Bagging and Boosting with reference to ensemble learning. Explain how these [10] methods help to improve the performance of the machine learning model.

**Q3** A Consider the example below where the mass, y (grams), of a chemical is related to the [10] time, x (seconds), for which the chemical reaction has been taking place according to the table. Find the equation of the regression line. Also explain performance evaluation measures for regression.

| Time, x (seconds) | 5 | 7 | 12 | 16 | 20 |
|---|---|---|---|---|---|
| Mass, y (grams) | 40 | 120 | 180 | 210 | 240 |

B What is Density based clustering? Explain the steps used for clustering task using [10] Density-Based Spatial Clustering of Applications with Noise (DBSCAN) algorithm.

**Q4** A Explain Clustering with minimal spanning tree along with example.                [10]

B Consider the dataset given below with 3 features Color, Wig, Num. Ears and one output [10] variable Emotion

| Color | G | G | G | B | B | R | R | R | R |
|---|---|---|---|---|---|---|---|---|---|
| Wig | Y | N | N | N | N | N | N | N | Y |
| Num. Ears | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 |
| Emotion | S | S | S | S | H | H | H | H | H |

i) Find root node of decision tree using GINI index
ii) Explain techniques can be used to handle over fitting in decision trees?

**Q5** A Consider the use case of Email spam detection. Identify and explain the suitable machine [10] learning technique for this task.

B Explain the Dimensionality reduction technique Linear Discriminant Analysis and its [10] real-world applications.

**Q6** A Define following terminologies with reference to Support vector machine:          [10]
Hyper plane, Support Vectors, Hard Margin, Soft Margin, Kernel

B Explain Ensemble learning algorithm Random Forest and its use cases in real world [10] applications.

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