PAPER ID-310908

Roll No:

# BTECH
## (SEM V) THEORY EXAMINATION 2024-25
## DATA ANALYTICS

**TIME: 3 HRS** **M.MARKS: 70**

**Note:** Attempt all Sections. In case of any missing data; choose suitably.

### SECTION A

**1. Attempt *all* questions in brief.** **2 x 07 = 14**

| Q no. | Question | CO | Level |
|---|---|---|---|
| a. | Differentiate between Predictive and Prescriptive Data Analytics. | 1 | K2 |
| b. | Define the term data lake, data base and data warehouse. | 1 | K1 |
| c. | Explain the concept of Outliers. | 2 | K2 |
| d. | Describe the concept of Lasso Regression. | 2 | K2 |
| e. | Differentiate between Steam Processing and Traditional Data Processing. | 3 | K2 |
| f. | Write the two limitations of K-Mean. | 4 | K1 |
| g. | Discuss the various categories of clustering techniques. | 5 | K2 |

### SECTION B

**2. Attempt any *three* of the following:** **07 x 3 = 21**

| | | | |
|---|---|---|---|
| a. | Explain the different categories of data analytics with examples. | 1 | K2 |
| b. | Explore PCA. Given data = {4, 8, 13, 7; 11, 4, 5, 14}. Compute the principal component using PCA algorithm. Also use PCA to reduce dimension from 2 to 1. | 2 | K3 |
| c. | Explore the term- Market Basket Analysis. Is it supervised or unsupervised? Determine how would a company use market basket analysis to improve its marketing strategies? | 3 | K3 |
| d. | Differentiate between CLIQUE and PROCLUS clustering | 4 | K4 |
| e | Differentiate between NoSQL database and a Relational database. Identify when one should use a NoSQL database instead of a relational database with a suitable example. | 5 | K4 |

### SECTION C

**3 Attempt any *one* part of the following:** **07 x 1 = 07**

| | | | |
|---|---|---|---|
| a. | Differentiate between Structured data, Semi-structured data and Unstructured Data. | 1 | K2 |
| b. | Describe Big Data and its characteristics. | 1 | K2 |

**4. Attempt any *one* part of the following:** **07 x 1 = 07**

| | | | |
|---|---|---|---|
| a. | Differentiate between Neural Network and Artificial Neural Network. | 2 | K2 |
| b. | A= {(10,0.2), (20,0.4), (25,0.7), (30,0.9), (40,1), (50,0.4}<br>B= {(10,0.4), (20,0.1), (25,0.9), (30,0.2), (40,0.6), (50, 0.6)}<br>Apply Union, Intersection, Complement, Bold Union and Bold Intersection operations on above listed Fuzzy Sets. | 2 | K3 |

**5. Attempt any *one* part of the following:** **07 x 1 = 07**

| | | | |
|---|---|---|---|
| a. | Explain and apply Flajolet-Martin algorithm on the following stream of data to identify unique elements in the stream.<br>S=1,3,2,1,2,3,4,3,1,2,3,1<br>Given: h(x)=(6x+1) mod 5 | 3 | K3 |



https://quescol.com | Free PYQs, Solutions, Syllabus, Notes etc

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| | | | |
|---|---|---|---|
| b. | Discuss the Concept of filtering in Data Stream Processing. Explain Bloom Filtering in detail. | 3 | K2 |

**6. Attempt any *one* part of the following: 07 x 1 = 07**

| | | | |
|---|---|---|---|
| a. | Cluster the following eight points (with (x, y) representing locations) into three clusters: A1(2, 10), A2(2, 5), A3(8, 4), A4(5, 8), A5(7, 5), A6(6, 4), A7(1, 2), A8(4, 9). Initial cluster centers are A1(2, 10), A4(5, 8) and A7(1, 2). The distance function between two points a = (x1, y1) and b = (x2, y2) is defined as<br>$P(a, b) = \|x2 - x1\| + \|y2 - y1\|$<br>Use K-Means Algorithm to find the three cluster centers after implanting all eight points. | 4 | K3 |
| b. | The database has 6 transactions. Assume Support threshold=50%, Confidence= 60% | 4 | K3 |

| TID | Items Bought |
|---|---|
| 10 | Beer, Nuts, Diaper |
| 20 | Beer, Coffee, Diaper |
| 30 | Beer, Diaper, Eggs |
| 40 | Nuts, Eggs, Milk |
| 50 | Nuts, Coffee, Diaper, Eggs, Milk |
| 60 | Beer, Nuts, Diaper |

i) Use Apriori algorithm to find all frequent itemsets.
ii) Show all the strong association rules (with support and confidence)

**7. Attempt any *one* part of the following: 07 x 1 = 07**

| | | | |
|---|---|---|---|
| a. | Draw the architecture [illegible] | | |

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