**GL BAJAJ**
Institute of Management & Research, PGDM Institute
Greater Noida

**F I N D   Y O U R   S P A R K**

Plot No. 2, Knowledge Park-III, Greater Noida (U.P.) –201306
**POST GRADUATE DIPLOMA IN MANAGEMENT (2025-26)**
**END TERM EXAMINATION (TERM -V)**

| | |
|---|---|
| Subject Name: Data Mining for Decision Making | Time: **90 mins** |
| Sub. Code: PGIT 51 | Max Marks: **40** |

**INSTRUCTIONS**

1. **All questions are to be solved using Orange on individual Computers/LAPTOPS.**
   o **Start with New workflow : Enter Subject Name, Date, Course & Session (PGDM 2024-26), SEMESTER, Student's Name, ROLL NUMBER on top eg. # Subject Name, # Date and so on**
   o **Export all processes as .ows files in one folder. Folder must be named with your full name and Roll Number for example (Name_GM-----) . submit the soft copies to the invigilator using a PD.**
   o **Conceptual questions must be answered by adding Text Annotation, from bottom left, within the workflow in .ows file.**
2. **During examination, no student is allowed to use mobile phones/Smart watch/Internet in any condition.**
3. **Data sheets (.csv file/Excel) will be provided as a soft copy on the Desktops/Laptops**

**Attempt all Four Questions.**                                                    **40 marks**

| | |
|---|---|
| CO-1 | Identify the business needs for knowledge discovery in order to create competitive advantages with data mining technologies appropriately in order to realize their real business value in solving business problems. (L3) |
| CO-2 | Utilize the basic data mining concepts and their application in business context using data mining tools.(L3) |
| CO-3 | Evaluate interesting and useful patterns from the explosive Volume of data by application of supervised and unsupervised techniques. (L3, L4, L5) |
| CO-4 | Examine Integration of theory and application in various functional areas through interdisciplinary approach. (L4) |

**Question 1**                                                                      **10 marks**

**Case scenario**

Given **Dataset Precision Agriculture.** An agricultural analytics company wants to improve crop productivity and resource utilization across multiple farms. The company has collected data on environmental factors such as soil moisture, temperature, humidity, rainfall, fertilizer usage, and crop yield. The company wants to identify productivity patterns and improve decision-making using data mining techniques. Mine the given data using the appropriate Data Mining algorithm to:

1. classify farms into different productivity groups based on environmental and input variables.

2. perform a detailed analysis of statistical measures and suggest strategies to improve productivity and resource optimization.

**Dataset Features:**

Farm_ID
Soil_Moisture_%
Temperature_C
Humidity_%
Fertilizer_kg_per_acre
Rainfall_mm
Crop_Type
Crop_Yield_ton_per_acre

**Question 2**                                                  **10 marks**

**Case Scenario**

Given Dataset **Smart Electricity.** An energy management company wants to analyze electricity consumption patterns in residential households using smart meter data. The dataset contains information on electricity consumption, temperature, number of appliances used, household type, and number of occupants. The objective is to optimize energy distribution and identify abnormal consumption patterns.

Mine the given data using the appropriate Data Mining algorithm to:

1. segment households into different consumption groups using clustering techniques.

2. perform a detailed statistical analysis and identify abnormal consumption patterns and suggest energy optimization strategies.

**Dataset Features:**

Household_ID
Hour_of_Day
Temperature_C
Appliance_Usage_Count
Household_Type
Occupants
Electricity_Consumption_kWh

**Question 3**                                                **10 marks**

**Case Scenario**

Given **Dataset Hospital Emergency**, A hospital wants to improve emergency room efficiency by analyzing patient data such as age, severity level, arrival time, treatment time, number of tests required, and doctor availability. The goal is to reduce patient waiting time and improve service quality.

Mine the given data using the appropriate Data Mining algorithm to:

1. classify patients based on severity and waiting time using suitable classification techniques.

2. perform a detailed statistical analysis and suggest strategies to improve hospital efficiency and reduce waiting time.

.

**Dataset Features:**

Patient_ID
Age
Severity_Level
Arrival_Hour
Treatment_Time_Min
Doctor_Available
Tests_Required
Waiting_Time_Min

**Question 4**                                                **10 marks**

**Case Scenario**

Given Dataset **Supermarket**. A supermarket has collected transaction data containing information about products purchased by customers. The company wants to identify frequently purchased product combinations to improve product placement and increase sales.

Mine the given data using the appropriate Unsupervised Data Mining algorithm to:

1. discover frequent itemsets using association rule mining techniques.

2. generate association rules and interpret support, confidence, and lift.

3. suggest product placement and cross-selling strategies based on the analysis

**Dataset Features:**

Transaction_ID

Product

| **Dataset 1** | **Dataset 2** | **Dataset 3** | **Dataset 4** |
|---|---|---|---|
| Precision_Agriculture.xlsx | Smart_Electricity Grid.xlsx | Hospital_Emergency.xlsx | supermarket_data.xlsx |

Note: All Questions are mapped to all course outcomes i.e. CO1, CO2, CO3, CO4