Duration: 180 Min (3 Hours)

Data Visualization & Analytics (Excel- SQL- Power BI):

Case Study Assessment

Task 1: Using MS Excel

Marks: 30

Solve the following questions using MS Excel and get all answers on a single worksheet. You are required to provide final answer for each question for the following questions as well. Upload the solved Excel file at the end of this section.

1. Create a column called `"Comorbidity_Count"` that sums all comorbidities (`DIABETES`, `HYPERTENSION`, `ASTHMA`,etc..). Then, calculate the total number of patients in each of these categories:

- No Comorbidities
- 1 Comorbidity
- 2 or More Comorbidities

2.Calculate the percentage of female patients (`SEX = Female`) who are hospitalized

- hint:(`PATIENT_TYPE = 1`)

3. Create a Pivot Table showing the average age of patients who were intubated (`INTUBED = 1`) and admitted to ICU (`ICU = 1`), grouped by `MEDICAL_UNIT` and `SEX`.

4. Calculate the percentage of patients where DEGREE ≥ 5, and the DEATH = 1, compared to the total population.

5. Create a summary table showing by Gender:

- Total ICU patients.
- Total patients with PNEUMONIA = 1 and AGE > 60.
- Percentage of patients with TOBACCO = 1 among ICU patients.

Task 2: Using SQL

Marks: 40

Solve the following questions using SQL. You are required to provide final answers (in notepad or excel) for the following questions as well as upload the .sql file at the end of this section (No other extension will be considered and won't be evaluated)

1. Write a query to count the number of patients grouped by `SEX` and `PATIENT_TYPE`.

2. Calculate the total number of patients and their percentage in each `DEGREE` category.

3. Write a query to find the top 3 `MEDICAL_UNIT`s with the highest number of deaths and calculate their percentage of total deaths.

4. Identify the total number of patients by gender who meet these conditions:

- PNEUMONIA = 1
- HYPERTENSION = 1
- AGE > 40.

5.Find the top 5 oldest patients (AGE DESC) who meet these conditions:

- ICU = 1
- TOBACCO = 1
- Have at least 2 comorbidities.
- Return columns: `ID`, `AGE`, `SEX`, `Total Comorbidities`.

Task 3: Using POWER BI — Marks: 30

Dashboard Requirements:

1. KPIs:

- Percentage of patients with PNEUMONIA = 1 who are intubated (`INTUBED = 1`).
- Percentage of female patients admitted to the ICU.
- ICU Mortality Rate (`DEATH = 1` / ICU Patients).
- Percentage of patients with three or more comorbidities in the overall population.
- Average age of patients who died (`DEATH = 1`).

2. Visualizations:

- Bar Chart: Show the count of `DEATH` (0 and 1) by `MEDICAL_UNIT` and `SEX`.
- Stacked Column Chart: Distribution of ICU admissions by `AGE group` (e.g., 0–20, 21–40, etc.) and `DEGREE`.
- Pie Chart: Proportion of patients by `PATIENT_TYPE` (Outpatient vs. Inpatient).
- Trend Line: Show ICU admissions over time grouped by `AGE`.

3. Advanced:

Comorbidity Risk Classification:

- Low Risk: No comorbidities, ICU = 0.
- Medium Risk: 1–2 comorbidities or ICU = 1.
- High Risk: ≥3 comorbidities or DEATH = 1.
- Decomposition Tree: Analyze ICU admission rates by `SEX`, `AGE group`, and `PNEUMONIA`.

Note:

The above list of KPIs and visualizations is not exhaustive. Feel free to add more KPIs and advanced visualizations that provide deeper insights into the data and make the dashboard more meaningful and impactful.

End

Thank You