INFORM 313 – ENDTERM EXAM REVIEW POINTERS

Information Management
1st Semester, AY 2025–2026

I. EXAM OVERVIEW (VERY IMPORTANT)

A. Test Type

- **Closed-book, closed-notes examination**
- **Multiple Choice** only
- Answers must be **shaded** on a **separate answer sheet**

B. Number of Items and Points

- **Total Questions:** 55
- **Total Points:** 70 points

Breakdown:

1. **Test I (Questions 1–40)**
    - Multiple Choice
    - 1 point each
    - Total: 40 points
2. **Test II (Questions 41–50)**
    - Multiple Choice (SQL-focused, syntax and logic)
    - 2 points each
    - Total: 20 points
3. **Test III (Questions 51–55)**
    - Scenario-based Multiple Choice (Risk Management)
    - 2 points each
    - Total: 10 points

II. EXAM INSTRUCTIONS (STUDENTS MUST FOLLOW STRICTLY)

Students must carefully observe the following:

- Read **each question carefully** before answering.
- Shade the circle corresponding to the **best answer only**.
- Use **ball pen or marker ONLY FOR FINAL ANSWER**.
    - ❌ Pencil is **not allowed as final answer**.
- **Do NOT erase or cross out** answers.
    - Any erasure or alteration will render the item **incorrect**.
- No electronic devices allowed:
- Cheating or violations will be dealt with according to university policy.

Coverage: SQL Basics, Data Analysis, Information Security and Risk Management, Business Intelligence and Data Analytics

I. SQL FUNDAMENTALS

A. Purpose and Definition of SQL

- Meaning of **SQL (Structured Query Language)**
- What SQL can do:
  - Retrieve data
  - Insert data
  - Update data
  - Delete data
  - Manage relational databases

B. Core SQL Statements

- SELECT – retrieve data
- INSERT INTO – add new records
- UPDATE – modify existing records
- DELETE – remove records

C. SQL Clauses and Keywords

- WHERE – filtering records (very important)
- DISTINCT – removing duplicate values
- FROM – specifying tables
- Logical operators:
  - AND
  - OR (note how it expands result sets)

D. Common SQL Errors & Logic Issues

- Missing commas between column names
- Incomplete WHERE clauses
- Using DELETE without WHERE (dangerous – deletes all rows)
- Misplaced keywords (WHEN, GET, UNIQUE are invalid in SQL)
- Understanding why queries return **more rows than expected**

E. Practical SQL Scenarios

- Selecting specific columns only
- Updating records with conditions
- Deleting records based on date conditions
- Inserting records with specific columns
- Understanding SQL risks (especially data loss)

II. INFORMATION SECURITY FUNDAMENTALS

A. CIA Triad (Core Concept)

Must clearly understand:

- **Confidentiality** – only authorized access
- **Integrity** – accuracy and protection from unauthorized changes
- **Availability** – systems and data accessible when needed

B. Key Security Concepts

- **Threat** – potential cause of harm
- **Vulnerability** – weakness that can be exploited
- **Exploit** – method of using a vulnerability
- **Malware** – malicious software (viruses, worms, ransomware)

C. Security Principles

- **Defense in Depth** – multiple layers of security
- **Least Privilege** – minimum access required
- **Accountability** – tracking user actions
- **Non-repudiation** – users cannot deny their actions

D. Human vs Technical Vulnerabilities

- Weak passwords
- Failure to log out
- Social engineering risks
- Insider threats

III. RISK MANAGEMENT & RISK ASSESSMENT

A. Purpose of Risk Assessment

- Identify threats
- Identify vulnerabilities
- Analyze impact and likelihood
- Prioritize risks

B. Risk Management Phases

- **Risk Identification**
- **Risk Assessment** (computing risk levels)
- **Risk Treatment / Mitigation**
- **Risk Monitoring**

C. Risk Treatment Strategies

- Risk reduction (mitigation)
- Risk avoidance
- Risk acceptance
- Risk transfer

D. 5×5 Risk Matrix (Critical Topic)

- Probability (Likelihood) scale: 1–5
- Impact scale: 1–5
- Risk Level = Probability × Impact
- Interpretation of risk scores:
    - Moderate
    - Major
    - Severe

E. Scenario-Based Analysis

- Legacy systems
- Unpatched servers
- Weak encryption

- Third-party API risks
- Identifying **root causes** and **best mitigation actions**

IV. BUSINESS INTELLIGENCE (BI) CONCEPTS

A. Purpose of Business Intelligence

- Transform raw data into meaningful insights
- Support data-driven decision-making

B. BI Architecture & Components

- Data sources
- ETL (Extract, Transform, Load)
- Data warehouses
- BI tools and dashboards

C. ETL Process

- Data collection
- Data cleaning
- Data standardization
- Data loading

D. Analytical Systems

- OLTP vs Data Warehouse
- Why data warehouses are optimized for analysis

V. DATA ANALYTICS & DATA MINING

A. Types of Analytics (Must Distinguish)

- **Descriptive** – what happened
- **Diagnostic** – why it happened
- **Predictive** – what will happen
- **Prescriptive** – what should be done

B. Data Mining Techniques

- Classification
- Clustering
- Regression
- **Anomaly Detection** (fraud detection)

C. Tools & Platforms

- BI tools (Power BI, Tableau, Qlik)
- Data mining tools (RapidMiner, WEKA)
- Big data platforms (Hadoop, Spark)
- Cloud data warehouses (BigQuery, Redshift, Azure Synapse)

VI. DATA PREPARATION & DATA QUALITY

A. Data Cleaning Tasks

- Handling missing values
- Removing outliers
- Fixing inconsistent formats

- Standardization before analysis

B. Common Data Challenges

- Poor data quality
- Integration issues
- Scalability
- Ethical concerns (bias, fairness)

VII. DATA VISUALIZATION

A. Importance of Visualization

- Simplifies complex data
- Improves understanding and communication
- Supports management decisions

B. Choosing the Right Visualization

- Line charts – trends over time
- Bar charts – comparisons
- Geographic maps – location-based analysis
- Dashboards – performance monitoring

VIII. APPLICATION-BASED SCENARIOS

Be prepared to:

- Identify the **best action** in a given scenario
- Choose the **most appropriate tool or method**
- Distinguish between similar concepts
- Apply theory to real-world business, healthcare, banking, and marketing cases

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INFORM 313 – *MOCK EXAM*
Information Management

1. Which SQL clause is used to filter records in a query?
A. ORDER BY
B. FROM
C. WHERE
D. DISTINCT

2. Which SQL command is used to retrieve data from a database?
A. GET
B. OPEN
C. SELECT
D. FETCH

3. Which SQL keyword is used to add a new record to a table?
A. ADD ROW
B. INSERT INTO
C. NEW ENTRY
D. PUT

4. Which principle ensures information is accessible only to authorized users?
A. Integrity
B. Availability
C. Confidentiality
D. Accountability

5. What do you call a weakness that can be exploited by an attacker?
A. Threat
B. Vulnerability
C. Malware
D. Risk

6. Which concept ensures users cannot deny their actions?
A. Accountability
B. Integrity
C. Non-repudiation
D. Defense in Depth

7. Which of the following belongs to the CIA Triad?
A. Social Engineering
B. Risk Appetite
C. Confidentiality
D. Malware

8. What is the main purpose of Business Intelligence?
A. Automate all business processes
B. Store raw data permanently
C. Transform data into useful insights
D. Replace human decision-making

9. Which BI process cleans and prepares data before analysis?
A. OLAP
B. ETL
C. Visualization
D. Reporting

10. Which analytics type explains why something happened?
A. Descriptive

B. Predictive
C. Prescriptive
D. Diagnostic

11. Which SQL statement correctly retrieves all records from Employees?
A. GET * FROM Employees;
B. SELECT Employees FROM *;
C. SELECT * FROM Employees;
D. OPEN Employees;

12. What is the error in the query below?
SELECT FirstName LastName FROM Employees;
A. Invalid SELECT keyword
B. Missing comma between columns
C. FROM clause is incorrect
D. Table name does not exist

13. Why is this SQL command dangerous?
`DELETE FROM Orders;`
A. It deletes only old records
B. It deletes the table structure
C. It deletes all records in the table
D. It cannot be executed

14. Which SQL command correctly inserts a new employee?
A. INSERT Employees VALUES ('Ana','Cruz');
B. INSERT INTO Employees (FirstName, LastName) VALUES ('Ana','Cruz');
C. ADD INTO Employees ('Ana','Cruz');
D. NEW ROW Employees ('Ana','Cruz');

15. Why does this query return more rows than expected?
SELECT * FROM Products WHERE Price > 100 OR Category = 'Electronics';
A. WHERE clause is invalid
B. OR operator expands the result set
C. Category must be numeric
D. SELECT cannot use OR

Scenario-Based (Risk Management)
Scenario:
A company uses an outdated analytics system storing sensitive data.
Probability = **5 (Almost Certain)**
Impact = **5 (Critical)**

16. What is the computed Risk Level?
A. 10 – Moderate
B. 15 – Major
C. 20 – Severe
D. 25 – Severe

17. What does an Impact rating of 5 – Critical mean?
A. Minor inconvenience
B. Temporary delay
C. High financial and reputational damage
D. No business effect

18. Based on the risk level, what action is MOST appropriate?
A. Ignore the risk
B. Monitor annually
C. Immediate high-priority intervention
D. Accept the risk

19. Which action BEST mitigates the root cause?
A. Increase employee reminders
B. Use stronger passwords only
C. Migrate to a patched and supported system
D. Reduce user access temporarily

20. Computing the risk score belongs to which phase?
A. Risk Identification
B. Risk Assessment
C. Risk Monitoring
D. Risk Treatment