SOFTWARE ENGINEERING

Sheet 3| Eng. Abdelrahman Osama

MCQ QUESTIONS

REQUIREMENTS ENGINEERING

Q1. Which of the following statements ***best distinguishes*** *Requirements Engineering from general software development activities?*

A. It focuses only on the user interface design and testing phases.

B. It ensures that system requirements are defined, managed, and tested using systematic and repeatable methods before development begins.

C. It involves coding and debugging the core modules to verify requirements.

D. It mainly concerns converting business logic into implementation details.

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REQUIREMENTS COMPLETENESS

*Q2. A requirements document is said to be **complete** when:*

A. It includes all the services the user requires, even if some contradict each other.

B. It lists only high-priority requirements clearly, deferring the rest for later phases.

C. It defines every service and constraint required by stakeholders without omission.

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REQUIREMENTS CONSISTENCY

*Q3. Which of the following **best illustrates a lack of consistency** in a requirements specification?*

A. One requirement states “The system shall accept only alphanumeric usernames”, while another states “Usernames may contain special symbols”.

B. One stakeholder requests a new reporting feature, while another requests a faster response time.

C. The requirements document is missing some descriptions of error handling.

D. The same requirement is described in both the functional and non-functional sections.

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STAKEHOLDERS

*Q4. Which scenario **best describes** the role of an external stakeholder in Requirements Engineering?*

A. A systems engineer refining internal data flow diagrams.

B. An end user testing a prototype for usability.

C. A software manager assigning coding tasks to the team.

D. A government agency enforcing legal compliance on a health records system.

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PRACTICAL QUESTIONS

TYPES OF REQUIREMENTS

Q1.

Scenario: You are developing an Online Appointment Booking System for a university clinic.

Task: Write one user requirement and one corresponding system requirement for the feature that allows students to book appointments with doctors.

- *Hint:*
  - *User requirement = what the user wants*
  - *System requirement = how the system achieves it*

TYPES OF REQUIREMENTS

Answer:

- User Requirement:
  - Students shall be able to book, view, and cancel medical appointments through a simple web interface.
- System Requirement:
  - The system shall store all appointment data in a centralized database and ensure that no two students can book the same doctor’s time slot simultaneously.

REQUIREMENTS CLASSIFICATION

Q2.

Scenario:
You are designing an **Online Food Ordering System**.

Task:
Write **two functional** and **two non-functional** requirements for the system.

- *Hint:*
  - *Functional = what the system does*
  - *Non-functional = how the system performs*

REQUIREMENTS CLASSIFICATION

Answer

- Functional Requirements:
  - The system shall allow users to add menu items to a shopping cart.
  - The system shall send an order confirmation email after successful payment.
- Non-Functional Requirements:
  - The system shall process each order within 3 seconds.
  - The system shall be available 99.9% of the time during business hours.

CASE STUDY

RE PROCESSES

Q1. Scenario:

You are part of a software engineering team tasked with developing the **Book E-Commerce System (BECS)** — an online platform where users can search, purchase, and review books.

Task:

Based on the *Requirements Engineering* process, perform the following:

1. **Feasibility Study:**
   - Identify two main factors to check before confirming the system is worthwhile to develop.
2. **Requirements Elicitation & Analysis:**
   - Suggest two techniques you would use to gather requirements from stakeholders (e.g., customers, admin, publishers).

RE PROCESSES – Q1

3. Requirements Specification:
   - Write one user requirement and one system requirement for the “Book Search and Purchase” feature.
4. Requirements Validation:
   - Mention two checks you would perform to ensure the requirements are correct and realistic.

RE PROCESSES – Q1

Answer

1. **Feasibility Study:**
   - Check if existing budget and technology can support online payment and large-scale database operations.
   - Ensure system integration with existing delivery and payment platforms.
2. **Elicitation & Analysis:**
   - Conduct mixed **open/closed interviews** with book sellers and users.
   - Observe user behavior through **ethnographic study** in physical bookstores.

RE PROCESSES – Q1

3. Specification:
    - *User Requirement:* Users shall be able to search books by title, author, or genre.
    - *System Requirement:* The system shall retrieve and display search results within 2 seconds for up to 10,000 book entries.
4. Validation:
    - Check for consistency between search and filtering requirements.
    - Verify realism of response time based on current hosting and hardware capacity.

REQUIREMENT SPECIFICATION

Q2. Scenario:

- You have been assigned to develop a **Book E-Commerce System (BECS)** — an online bookstore that allows customers to browse, search, and purchase books. Managers can manage the inventory, set promotions, and track transactions.

Task:

- Prepare a **Software Requirements Specification (SRS)** document for the BECS using the **IEEE 830/29148 SRS standard**.

REQUIREMENT SPECIFICATION – Q2

Your SRS should include:

- Introduction
  - Purpose, scope, and intended audience.
  - Definitions and abbreviations.
- Overall Description
  - Product perspective and main functions.
  - User characteristics and system constraints.
  - Assumptions and dependencies.

REQUIREMENT SPECIFICATION – Q2

- Specific Requirements
  - Functional requirements (e.g., login, browse, purchase, manage inventory).
  - Non-functional requirements (e.g., performance, usability, reliability).
- Optional:
  - Use case diagrams or sequence diagrams.
  - User interface mockups or prototypes.

REQUIREMENT SPECIFICATION – Q2

Answer

1. Introduction

- **Purpose (why):**
  To define the functional and non-functional requirements of an online Book E-Commerce System that allows customers to buy books and managers to manage inventory and promotions.
- **Scope (what):**
  BECS provides users with the ability to register, browse books, add them to a shopping cart, and check out. Managers can add, update, and remove books, as well as create promotions.
- **Intended Users:**
  - **Customers** (browse and purchase books)
  - **Members** (customers with promotion benefits)
  - **Manager** (manages inventory and promotions)

REQUIREMENT SPECIFICATION – Q2

2. Overall Description

- **Product Perspective (how):**
  BECS is a web-based system accessible through common browsers. It interacts with a central database that stores user, book, and transaction data.
- **Product Functions:**
  - User registration and login.
  - Browse/search books.
  - Add to cart and checkout.
  - Manage inventory (CRUD operations).
  - Create promotions.
  - Send automated emails (promotions, low stock).

REQUIREMENT SPECIFICATION – Q2

- **User Characteristics:**
  Users are expected to know basic web navigation (using browser, keyboard, and mouse).
- **Constraints:**
  - Works only in Firefox and Internet Explorer.
  - No password recovery or security encryption.
  - Single manager account.

REQUIREMENT SPECIFICATION – Q2

3. Specific Requirements

➢ Functional Requirements:

- The customer shall be able to create an account and log in.
- The system shall allow browsing and searching books by title.
- The customer shall be able to add one copy of each book to a shopping cart.
- The system shall allow checkout using a 16-digit credit card number.
- The manager shall be able to add, edit, and delete books.
- The manager shall be able to create and send promotion codes to members.
- The system shall log all transactions.

REQUIREMENT SPECIFICATION – Q2

- Non-Functional Requirements:
  - **Performance:** System must respond to user actions within 3 seconds.
  - **Usability:** Simple, intuitive web interface.
  - **Reliability:** Must maintain consistent data in the database.
  - **Availability:** Accessible to users within MSU lab environments.

4. Assumptions and Dependencies

- System runs on a stable web server and database.
- Users have access to Internet Explorer or Firefox.
- No external payment gateway integration required.

REQUIREMENT SPECIFICATION – Q2

5. Conclusion

BECS is a simple, functional web application for managing book sales online, supporting both customer transactions and managerial inventory control, based on IEEE SRS standards.

ASSIGNMENT

SMART PARKING MANAGEMENT SYSTEM

Scenario:

You are asked to prepare a **Software Requirements Specification (SRS)** document for a **Smart Parking Management System (SPMS)**.
This system will help drivers find available parking spots in real time through a mobile or web application. Parking lot managers can monitor occupancy, set parking rates, and view usage reports.

SMART PARKING MANAGEMENT SYSTEM

Assignment Requirements:

Your SRS must include the following main sections (based on IEEE standards):

- **Introduction (2 marks)**
  - Purpose of the system
  - Scope of the system
  - Intended users
- **Overall Description (3 marks)**
  - Product perspective (how it works with sensors/databases)
  - Product functions (main features)
  - User characteristics and system constraints

SMART PARKING MANAGEMENT SYSTEM

- Specific Requirements (3 marks)
  - Functional Requirements (at least 5):
    e.g., locate nearest parking, reserve a slot, make payments, admin reports, etc.
  - Non-Functional Requirements (at least 3):
    e.g., availability, performance, security, scalability.
- Assumptions and Dependencies (2 marks)
  - Mention assumptions (e.g., internet availability, sensor accuracy)
  - Identify any dependencies (hardware sensors, payment gateway, etc.)

ANY QUESTIONS?