National University of Computer and Emerging Sciences

Software Construction & Development (SE3001,SE3005)

Sessional-II Exam

Date: November 4, 2025

Course Instructor(s)

Dr. Farooq Ahmed

Total Time:	1 hour
Total Marks:	30
Total Questions:	2

[handwritten] 23L-3004

Roll No

[handwritten] BSE - 5A

Section

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Student Signature

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Attempt all questions on the answer sheet
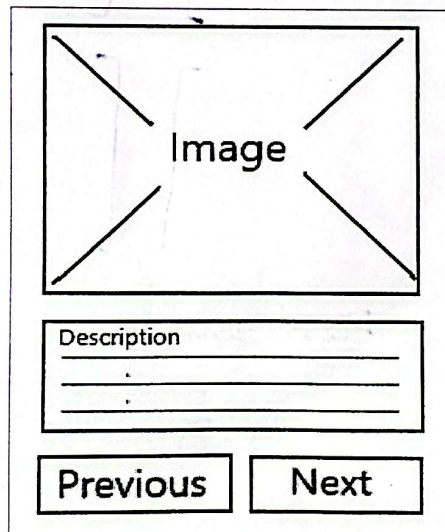

CLO 2: Implement software design patterns as part of software construction activity

Question 1   [20 marks]

[handwritten annotations around mock-up:]

Image — Cover Image
Label — Description

MainForm
Controller → interface called to Listener
→ Image Model : Load ( )
  └ IODAO → DBDAO
            load (id)
            loadIds( )

set Dimensions (width, Height)
Model — Image Model
Image ~~Model~~
Text

Buttons

id, imagepath, description

[mock-up diagram showing:]

Image

Description
_____
_____

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Consider the mock-up above for a simple image-gallery application:

1. Images are stored in a relational database table **Image** with columns: id, imagepath, description
2. UI shall show images and their description, after fetching from the database, one-by-one.
3. **Next** button shall move to (and display) the next image and its description
4. **Previous** button shall move to (and display) the previous image and its description

Implement the above UI (along with necessary event handling) using **Java Swing** and a **3-layered** architecture.

[handwritten] Image IO.read(new File)

Note: Image can be read from a file using **ImageIO** (just like other IOStream operations) and drawn on a panel using **drawImage** of its graphic component

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CLO 3: Design Test Cases for a Software System

Question 2   **[10 marks]**

TicTacToe
- board : char[][]
+ makeMove(i : int, j : int, player : int) + isDraw() : boolean + isWin() : int

Consider a TicToeGame on a 3x3 grid and played between 2 players where player 1 uses 'X' symbol and player 2 uses 'O'. Write unit tests using **JUnit** to determine:

1. Game ends in a draw   Draw
2. Game won by a player (either 1 or 2).