COMSATS University Islamabad, Abbottabad Campus

Department of Computer Science

Examination – Final Exam (SP-25)

Class: BSE 6(A, C)
Subject: Mobile Application Development (CSC 303)
Total Time Allowed: 3 hours
Name: _____

Date: 10th July, 2025
Instructor: Javed Raza
Max Marks: 100
Registration # FA22-BSE

CLO-1 (Marks: 35)

a) **Describe** a class Employee with a method calculateSalary() that prints a fixed salary. Create another class Manager that extends Employee and overrides the calculateSalary() method. Demonstrate polymorphism using these classes. (10)

b) **Describe** a Dart program with the following requirements:
1. Define a **Map<String, List<String>>** that contains the following key-value pairs:
   - **"Fruits": ["Apple", "Banana", "Orange"]**
   - **"Vegetables": ["Carrot", "Potato", "Spinach"]**
   - **"Dairy": ["Milk", "Cheese", "Butter"]**
2. Write a function named **printCategoryItems** that takes a category (key) as input and prints all the items in that category. (05)
3. In the **main()** function, call the printCategoryItems function for each category in the map.

c) **Describe** the Following:
You are designing a Library Management System. **Implement** a Dart class Book with properties title, author, and availableCopies. Add a method borrowBook() to decrease available copies and returnBook() to increase them. Demonstrate the class with object manipulation. (10)

d) **Describe** the following.
You are building a student record system. Create a list of student names.
Write functions to:
- Display all names.
- Search for a specific name.
- Count how many students have names starting with the letter 'A'. (10)

CLO-2 (Marks: 35)

a) **Implement** a Flutter app using `MaterialApp` that includes the following in the home screen:
- An `AppBar` with a title and a leading icon
- A `Column` in the body that contains:
  - A welcome `Text`
  - A `Row` with one `Icon` and one `Image` side by side
  - An `ElevatedButton` below the image (10)

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b) **Implement** a Flutter application with the following requirements:

1. Define a base widget class **NewContainer** that extends **StatelessWidget.**
   - The class should take **width** and **height** as parameters.
   - Create two subclasses:
   - **ColoredContainer**:
   - Accepts an additional parameter **color** (Color).
   - Overrides the **build()** method to display a **Container** with the specified width, height, and color.
   - **GradientContainer**:
   - Accepts additional parameters **startColor** and **endColor.**
   - Overrides the **build()** method to display a **Container** with a gradient background using the specified colors.
   - In the **main()** function, build a Flutter app that:
2. Displays one **ColoredContainer** and one GradientContainer in a column layout. (20)

c) **Execute** a Flutter application with the following scenario:

Scenario:

You are building an offline app that displays images stored locally in the app's assets folder.

- The class should take **width** and **height** as parameters.

Question:

Write a Flutter code snippet to display a local image from the assets/images folder. Ensure the image file is included in the app's **pubspec.yaml**. (05)

CLO-3 (Marks: 30)

a) **Implement** a Flutter application with the following requirements:

Scenario:

You are tasked with creating a registration form for a mobile app. The form should include fields for the user's name, email, password, and a confirm password field. The app should validate the form as follows:

1. All fields are required.
2. The email should be in a valid format.
3. The password must be at least 6 characters long.
4. The confirm password field must match the password field.

Once the form is successfully submitted, the entered information should be printed to the console. (10)

b) **Execute** a Flutter application that uses both a Drawer and a BottomNavigationBar.

- Add the drawer with 2 options: Profile and Settings
- Add a bottom navigation bar with 2 tabs: Home and Notifications
- Change the Scaffold body based on selected bottom tab
- Use a consistent custom theme across the app (10)

c) **Execute** a Flutter application using both TabBar (top tab navigation) and a Drawer.

- Tabs: News, Videos, and Reviews
- Drawer items: About Us, Feedback, and Help
- Use a custom ThemeData for consistent color scheme and text style
- Ensure each tab displays unique content (10)

**********Good Luck**********

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