Osmani

# COMSATS University Islamabad, Abbottabad Campus

## Department of Computer Science

### Examination – Final Exam (2025)

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

Date: 18th Jan, 2025
Instructor: Javed Raza
Max Marks: 100
Registration # _____

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**CLO-1 (Marks: 30)**

a) **Describe** an Employee class with properties name, salary, and department. Initialize a list of Employee objects and use a forEach loop to give a 5% raise to all employees in the "IT" department, then print the updated salary for each employee. Write a code of dart. (05)

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** with Dart code that defines a base class Shape with a method area() that returns 0. Create two subclasses, Rectangle and Circle. In Rectangle, add properties for width and height and override area() to return the area of the rectangle. In Circle, add a property for radius and override area() to return the area of the circle. Write a main function to calculate and print the area of a rectangle and a circle. (10)

d) **Describe** a class called Calculator with a method named add().

1. The add() method should:
   - Accept two or three integer parameters.
   - If called with two parameters, return the sum of the two.
   - If called with three parameters, return the sum of all three.
2. In the main() function:
   - Create an object of Calculator.
   - Call the add() method with two integers and print the result.
   - Call the add() method with three integers and print the result. (10)

**CLO-2 (Marks: 30)**

a) **Implement** a Flutter application that displays a card with the following structure:

1. Use a **MaterialApp** with a custom theme
2. On the home screen:
   - Add a Card widget that contains:
     - A Row with the following elements:

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- An Image.asset (e.g., a profile picture).
- A Column with:
- A Text widget for a name (e.g., "John Doe") styled with a bold font and a font size of 20.
- A smaller **Text** widget for a description (e.g., "Flutter Developer") styled with an italic font and a font size of 16. (10)
- A trailing Icon (e.g., **Icons.edit**) with a size of 24 and a color matching the theme.

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: (10)
2. Displays one **ColoredContainer** and one GradientContainer in a column layout.

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.
**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)

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

**Scenario:**
You are building a music player app. The play button is represented by an icon, and when tapped, it toggles between "**play**" and "**pause**."
**Question:** (05)
Write a Flutter code snippet to display a play icon that toggles to a pause icon when tapped.

**CLO-3 (Marks: 40)**

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.

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Once the form is successfully submitted, the entered information should be printed to the console. (13)

b) **Execute** a Flutter application with the following features:

1. Add an **AppBar** with a title "Drawer and Tabs App".
2. Implement a `Drawer` with the following items:
   - Dashboard
   - Logout
3. Implement a **BottomNavigationBar** with the following tabs:
   - Home
   - Favorites
   - Profile
4. When a tab is selected:
   - Display the corresponding screen content.
5. When a Drawer item is tapped:
   - For "Dashboard", display a message using a **SnackBar** that says "Welcome to the Dashboard!".
   - For "Logout", navigate back to a **LoginScreen** (create a simple login screen with just a button for demonstration). (20)

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

**Scenario**:
You are building a dashboard where each section contains a title and a grid of items. For example, the dashboard has a "**Categories**" section, which includes a grid of category icons.

**Question**:
Write a Flutter code snippet to create a **ListView** where one of the items contains a **GridView** for displaying category icons. (07)

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

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