**CHAROTAR UNIVERSITY OF SCIENCE AND TECHNOLOGY**

**FACULTY OF TECHNOLOGY AND ENGINEERING**

**CHANDUBHAI S. PATEL INSTITUTE OF TECHNOLOGY**

**DEPARTMENT OF ARTIFICIAL INTELLIGENCE & MACHINE LEARNING**

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| **Subject :** Mobile Application Development | **Semester:** 5 |
| **Subject Code:** AIML308 | **Academic Year :**2025-26(ODD) |

**Course Outcome (COs):**

At the end of the course, the students will be able to:

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| **CO1** | Understand the features, advantages, and disadvantages of Flutter and demonstrate application development in Android Studio. |
| **CO2** | Apply widget concepts, state management, and object-oriented programming principles in Dart for developing Flutter applications. |
| **CO3** | Analyse and implement different layout widgets and manage application state and navigation effectively. |
| **CO4** | Evaluate database solutions like SQLite and perform CRUD operations. |
| **CO5** | Create and integrate APIs for enhanced user experience and Deployment of application. |

**Practical List**

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| Practical Number | 1 |
| CO/PO | CO1 |
| Problem Definition | You are building a mobile application where users navigate through multiple screens like login, dashboard, and profile. Create a basic multi-screen Flutter app with navigation, passing data between pages. |
| Key Questions / Analysis / Interpretation to be evaluated during/after Implementation  Que / Key Point | How does navigation work in Flutter?  How can data be passed between screens?  What is the difference between push and pushReplacement? |
| Supplementary Problems - | Splash screen + login screen + dashboard |
| Key Skills to be addressed | Widget tree, Navigation, Routing |
| Learning Outcome - | Understand project structure and navigation |
| Total Hours of Problem Definition Implementation | 2 hours |

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| Practical Number | 2 |
| CO/PO | CO2 |
| Problem Definition | You are building a mobile application where users navigate through multiple screens like login, dashboard, and profile. Develop a temperature converter app using Dart functions and input widgets. |
| Key Questions / Analysis / Interpretation to be evaluated during/after Implementation  Que / Key Point | How to take and validate user input?  What is the role of Dart functions?  How to update UI on user action? |
| Supplementary Problems - | Currency converter app |
| Key Skills to be addressed – | Dart Basics, Stateful Widget, Event Handling |
| Learning Outcome - | Apply Dart logic to UI-based apps |
| Tools/Technology To Be Used | Flutter, Dart |
| \* Total Hours of Problem Definition Implementation | 2 hours |

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| Practical Number | 3 |
| CO/PO | CO2, CO3 |
| Problem Definition | You are building a mobile application where users navigate through multiple screens like login, dashboard, and profile. Create a dynamic TODO app using State Management (setState) and ListView.builder. |
| Key Questions / Analysis / Interpretation to be evaluated during/after Implementation  Que / Key Point | How to add/delete items dynamically?  How does setState work?  How to manage dynamic lists? |
| Supplementary Problems - | Add categories, filter completed tasks |
| Key Skills to be addressed | setState, ListView, Dynamic UI |
| Learning Outcome - | Manage app state and dynamic content |
| Total Hours of Problem Definition Implementation | 2 hours |

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| Practical Number | 4 |
| CO/PO | CO3 |
| Problem Definition | You are building a mobile application where users navigate through multiple screens like login, dashboard, and profile. Design a Form-based Registration App with validation using TextFormField. |
| Key Questions / Analysis / Interpretation to be evaluated during/after Implementation  Que / Key Point | How to perform form validation?  How to use controllers and keys?  What are common validation types? |
| Supplementary Problems - | Feedback form with rating |
| Key Skills to be addressed – | Form Handling, Input Validation |
| Learning Outcome - | Validate form input securely |
| Total Hours of Problem Definition Implementation | 2 hours |

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| Practical Number | 5 |
| CO/PO | CO4 |
| Problem Definition | You are building a mobile application where users navigate through multiple screens like login, dashboard, and profile. Build a Student Records App with CRUD operations using SQLite. |
| Key Questions / Analysis / Interpretation to be evaluated during/after Implementation  Que / Key Point | How to store, update, retrieve data locally?  What is the role of future builder?  How to connect to SQLite? |
| Supplementary Problems - | Book management or Expense tracker app |
| Key Skills to be addressed – | Database operations, CRUD logic |
| Learning Outcome - | Implement local DB solutions |
| \* Total Hours of Problem Definition Implementation | \* Approx. 2 hours |

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| Practical Number | 6 |
| CO/PO | CO4 |
| Problem Definition | You are building a mobile application where users navigate through multiple screens like login, dashboard, and profile. Create a Notes App with persistent storage using Shared Preferences. |
| Key Questions / Analysis / Interpretation to be evaluated during/after Implementation  Que / Key Point | When to use shared preferences?  What data types can be stored?  How to persist small data? |
| Supplementary Problems - | Dark mode toggle, Remember me feature |
| Key Skills to be addressed – | Local storage, Preference handling |
| Learning Outcome - | Store app settings or session |
| Total Hours of Problem Definition Implementation | 2 hours |

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| Practical Number | 7 |
| CO/PO | CO2, CO3 |
| Problem Definition | You are building a mobile application where users navigate through multiple screens like login, dashboard, and profile. Design a Product Catalog App using GridView and custom cards with images. |
| Key Questions / Analysis / Interpretation to be evaluated during/after Implementation  Que / Key Point | How to create reusable custom widgets?  How to use GridView for layout?  How to load local assets (images)? |
| Supplementary Problems - | Gallery app or Recipe app |
| Key Skills to be addressed – | UI design, Reusability, Grid layout |
| Learning Outcome - | Design reusable and responsive UI |
| Total Hours of Problem Definition Implementation | 2 hours |

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| Practical Number | 8 |
| CO/PO | CO5 |
| Problem Definition | You are building a mobile application where users navigate through multiple screens like login, dashboard, and profile. Connect to a REST API (e.g., weather, user data) and display using FutureBuilder. |
| Key Questions / Analysis / Interpretation to be evaluated during/after Implementation  Que / Key Point | What is JSON parsing?  How to handle async APIs?  How to deal with loading/error states? |
| Supplementary Problems - | News app |
| Key Skills to be addressed – | API consumption, Async/Await |
| Learning Outcome - | Handle API data and render UI |
| \* Total Hours of Problem Definition Implementation | 4 hours |

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| Practical Number | 9 |
| CO/PO | CO5 |
| Problem Definition | You are building a mobile application where users navigate through multiple screens like login, dashboard, and profile. Develop a Login Authentication App using API-based credential check and session handling. |
| Key Questions / Analysis / Interpretation to be evaluated during/after Implementation  Que / Key Point | How to send login credentials securely?  How to store token/session?  How to handle invalid login? |
| Supplementary Problems - | Two-factor login or role-based access |
| Key Skills to be addressed – | Auth Logic, API calls, Sessions |
| Learning Outcome - | Implement login flow using APIs |
| \* Total Hours of Problem Definition Implementation | 4 hours |

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| Practical Number | 10 |
| CO/PO | CO5 |
| Problem Definition | You are building a mobile application where users navigate through multiple screens like login, dashboard, and profile. Create and generate a Signed APK for deployment. Document steps to publish the app. |
| Key Questions / Analysis / Interpretation to be evaluated during/after Implementation  Que / Key Point | What is a keystore?  What are deployment options in Flutter?  How to troubleshoot APK build issues? |
| Supplementary Problems - | Include iOS build steps (document only) |
| Key Skills to be addressed – | Deployment, Publishing, Versioning |
| Learning Outcome - | Understand deployment pipeline |
| \* Total Hours of Problem Definition Implementation | \* Approx. 2 hours |

**Other Supplementary Experiment (Applications):**

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| **Sr. No.** | **AIM** |
| 1 | Create an application to learn ABCD… and 123…10 for children with attractive UI and Sound. |
| 2 | Create an application to learn Addition, subtraction, multiplication, and division for children with attractive UI. |
| 3 | Create an application to match the given Image and spelling for children with attractive UI. |
| 4 | Create an application for EMI Calculator. |
| 5 | Create an application for Placement Preparation. |
| 6 | Create an application for Gujarat Government schemes. |
| 7 | Create an application for Subject-wise IT Quiz. |
| 8 | Create an application for Resume Maker. |
| 9 | Create an application for the Income tax Calculator. |
| 10 | Create an application for Gym Management. |
| 11 | Create an application for Bhagavad Gita. |
| 12 | Create an application for SMS Schedular and Reminders. |
| 13 | Create an application for Gujarat Tourist Guide. |
| 14 | Create an application for QR Code Generator. |
| 15 | Create an application for MP3 Cutter and Joiner. |
| 16 | Create an application for Video Cutter and Joiner. |
| 17 | Create an application for creating Videos from Images. |
| 18 | Create an application for Unit Converter. |
| 19 | Create an application for RTO Driving License Test. |