20 MCQs and 15 Essay Questions (3 hours)

Part I
(2 marks for each correct answer)

1. In Flutter, what is the purpose of an InkWell widget?

   A) To detect the ink level of the device
   B) To detect gestures like taps
   C) To detect network connectivity status
   D) To detect GPS location
   E) To detect screen orientation changes

2. Flutter was first introduced by Google as

   A) Skia
   B) Bird
   C) Sky
   D) Dash
   E) Dart

3. What is the role of the main() function in a Flutter application?

   A) It initializes the application's state
   B) It is the entry point of the application
   C) It defines the main user interface
   D) It handles user interactions
   E) It sets up the device's native bridge

4. Which widget is used to create a screen or page in a Flutter application?

   A) Scaffold
   B) Container
   C) Column
   D) ListView
   E) AppBar

5. Which widget is used to overlay one widget on top of another in Flutter?

   A) Overlay
   B) Stack
   C) Wrap
   D) Align
   E) Position

6. What is the purpose of the flutter pub get command in Flutter development?

   A) It retrieves and installs dependencies listed in the pubspec.yaml file
   B) It compiles the entire project and generates an APK
   C) It initializes a new Flutter project in the current directory
   D) It removes unused packages from the project
   E) It updates the Flutter SDK to the latest version

7. What is the purpose of the Cupertino package in Flutter?

   A) It provides iOS-style widgets for Flutter applications.
   B) It manages database operations in a Flutter app.
   C) It handles network requests using Cupertino servers.
   D) It creates a cup-shaped widget for custom designs.
   E) It defines the cup sizes for widgets.

8. Which Flutter widget is used to display an image from the internet?

   A) Image.network
   B) Image.asset
   C) Image.file
   D) Image.internet
   E) Image.remote

9. What does the async keyword allow you to do when used in a function definition?

   A) It allows you to use the await keyword within the function.
   B) It forces the function to execute synchronously.
   C) It specifies the duration of an asynchronous task.
   D) It determines the return type of the function.
   E) It specifies the parameter of the function.

10. What is the purpose of using asynchronous tasks in Flutter?

    A) To perform long-running tasks without blocking the main thread.
    B) To create animations and transitions in the UI.
    C) To define the layout and structure of the app.
    D) To handle user interactions.
    E) To handle button clicks.

11. What is the purpose of the Hero widget in Flutter?

    A) It provides animations for widgets transitioning between screens.
    B) It creates a floating action button for navigation.
    C) It allows the user to swipe between different pages.
    D) It applies a material design style to a widget.
    E) It helps to draw heroes in a widget.

12. Which Firebase service is used for cloud messaging and notifications in Flutter apps?
    A) Firebase Authentication
    B) Firebase Cloud Messaging
    C) Firebase Firestore
    D) Firebase Realtime Database
    E) Firebase Hosting

13. What is Firebase Cloud Functions used for in Flutter development?

    A) It enables offline data storage in mobile apps.
    B) It provides authentication services.
    C) It allows you to run backend code in response to events.
    D) It handles cloud messaging and notifications.
    E) It provides real-time synchronization of data.

14. Which method is commonly used for storing small pieces of data in Flutter applications?

    A) SharedPreferences
    B) SQLite
    C) Firebase Firestore
    D) RESTful APIs
    E) ObjectBox

15. How does Firebase Cloud Firestore handle data synchronization in Flutter?
    A) It provides real-time synchronization between devices.
    B) It relies on server-side rendering for data updates.
    C) It uses a WebSocket connection for data updates.
    D) It stores data in a local SQLite database.
    E) It periodically polls the server for updates.

16. Which property of the Container widget is used to define the background color?

   A) color
   B) background
   C) fill
   D) backgroundColor
   E) style

17. What is the most precise way to add padding around the contents of a Container in Flutter?

   A) Using the padding property.
   B) Wrapping the child widget with a Padding widget.
   C) Using the margin property.
   D) By setting the spacing attribute.
   E) It's not possible to add padding to a Container.

18. What is the purpose of the BoxDecoration property in a Container?

   A) It defines the visual appearance of the Container.
   B) It manages the alignment of child widgets.
   C) It handles user interactions.
   D) It sets the background color.
   E) It adds padding around the Container.

19. What is the primary difference between the Container and SizedBox widgets in Flutter?

   A) Container can hold multiple child widgets, while SizedBox can only hold one.
   B) SizedBox provides a fixed size, while Container can adjust its size based on the child.
   C) Container is a stateless widget, while SizedBox is statefull.
   D) Container is a stateful widget, while SizedBox is stateless.
   E) There is no significant difference between the two.

20. What is the purpose of using the path_provider package in Flutter?

   A) It provides access to the device's file system.
   B) It manages network requests and responses.
   C) It handles user authentication.
   D) It creates responsive UIs.
   E) It offers a secure storage location for sensitive data.

Part II

1. Name five components that are inside a smartphone. (2 marks)

2. Name and describe the sensors you can find inside smartphones. (3 marks)

3. What is Flutter, and how does it differ from React Native mobile app development frameworks? (3 marks)

4. Explain the concept of "hot restart" in Flutter and why it is beneficial for developers. (3 marks)

5. Explain the significance of the build method in a Flutter widget. (3 marks)

6. Describe the difference between Stateless and Stateful widgets in Flutter. (3 marks)

7. What is the purpose of the pubspec.yaml file in a Flutter project, and what information does it contain? (3 marks)

8. List five state management packages in Flutter and explain the difference between the Provider and Riverpod state management packages. (4 marks)

9. Describe the pros and cons of mobile native application development over cross platform application development. (4 marks)

10. Describe the differences between web apps and native mobile apps. (4 marks)

11. What are the commonly used layout widgets in Flutter? Describe three of the layout widgets. (4 marks)

12. Explain the purpose of the MaterialApp widget and its significance in a Flutter application. Please provide an example code of how MaterialApp can be used to set the home page of the app. (4 marks)

13. What is the Scaffold widget, and could you describe its attributes? (4 marks)

14. You are asked to create a splash screen with two colors (red and blue). One color should take up half of the screen, and the other color should take up the other half vertically. Please write down the code to create the UI. (8 marks)

15. Please provide an overview of the high-level architecture of the project you developed for the mobile application development module. This should include an explanation of the technologies used, integrations, and databases involved in the app. If possible, feel free to include diagrams for better clarity. (8 marks)