**Overview of "Ayantra: Smart Ride-Sharing and Car Rental Platform"**

**Objective**:  
Develop a robust ride-sharing and car rental platform providing seamless user experience and efficient backend support.

**Key Features**:

1. Cross-platform user application using Flutter.
2. Real-time location tracking.
3. Integrated payment gateway.
4. In-app messaging and communication.
5. Scalable backend infrastructure with Firebase.

**Point-Wise Summary for Viva Preparation**

**1. Introduction**

* **Project Title**: Ayantra: Smart Ride-Sharing and Car Rental Platform.
* **Purpose**: To create a comprehensive ride-sharing platform addressing real-time user needs.

**2. Technologies Used**

* **Frontend**: Flutter (Material Design 3.0, Provider/GetX for state management).
* **Backend**: Firebase (Authentication, Realtime Database, Cloud Storage, Analytics).
* **APIs**: Google Maps for real-time tracking.

**3. Completed Features**

* Fully functional **user mobile application**.
* Key functionalities:
  + User authentication.
  + Real-time tracking with Geolocator.
  + Payment gateway integration.
  + Push notifications.
  + Ride history and profile management.

**4. Performance Metrics**

* Application size: **25 MB**.
* Launch time: **<2 seconds**.
* Backend response time: **<100 ms**.
* Server uptime: **99.9%**.

**5. Ongoing Development**

* **Driver Application**:
  + Planning and architecture design.
* **Admin Dashboard**:
  + Requirements analysis and UI/UX planning.

**6. Challenges Faced**

* **Technical**:
  + Battery optimization for location tracking.
  + Ensuring real-time updates in variable network conditions.
* **Development Risks**:
  + Scaling for large user base.
  + Ensuring secure data transmission and storage.

**7. Literature Review Impact**

* Improved real-time tracking accuracy (**98%**) using methods suggested by Smith et al. (2023).
* Reduced latency by **40%** with Firebase Cloud Messaging.
* Achieved battery-efficient tracking techniques.

**8. Future Scope**

* Complete development of driver-side application and admin dashboard.
* Enhance scalability and user analytics.
* Add advanced features like ride pooling and dynamic pricing.

**9. Key Questions to Expect**

* **Why Flutter?** Explain cross-platform benefits and faster development.
* **How does real-time tracking work?** Discuss Google Maps API and Firebase synchronization.
* **How do you handle offline data synchronization?**
* **What steps are taken for security?** Focus on secure authentication and encrypted data transmission.