MERN Stack Assignment: Courier and Parcel Management System

Objective:

Build a courier tracking and parcel management system for a logistics company.
Users can book parcels, assign delivery agents, track parcels in real-time, and manage delivery statuses.

Functional Requirements:

Roles:
- Admin
- Delivery Agent
- Customer

Customer Features:
- Register/Login
- Book a parcel pickup (pickup address, delivery address, parcel size/type, COD or prepaid)
- View booking history & statuses
- Track parcel in real-time on a map

Delivery Agent Features:
- View assigned parcels
- Update status (Picked Up, In Transit, Delivered, Failed)
- Get optimized delivery route (Google Maps API)
Admin Features:
- Dashboard with parcel metrics (daily bookings, failed deliveries, COD amounts)
- Assign agents to parcels
- View all users and bookings
- Export reports (CSV/PDF)

Backend (Node.js + Express or NestJS + PostgreSQL/Mongodb + JWT):
- APIs:
- Auth (Register/Login with roles)
- Parcel CRUD
- Agent assignment
- Parcel status updates
- Booking analytics & reports
- Geolocation tracking via coordinates

- Role-based access control (middleware)

Frontend:
- Web App for Admin and Customers
- Real-time updates via Socket.IO (status changes)
- Google Maps Integration for tracking and route view

Advanced (Bonus):
- QR Code generation for parcels
- Barcode scan by agents to confirm pickup/delivery
- Email/SMS notifications for customers
- Multi-language support (e.g., English & Bengali)

Deliverables:
- GitHub repo with documentation
- Hosted Web App (e.g., Vercel/Netlify)
- Postman collection for backend API
- Final PDF report + video demo

Evaluation Criteria:
- Functional completeness
- Code structure and clean architecture
- Responsive UI and UX polish
- Real-time updates and geolocation handling
- Real-world use cases like COD, failed deliveries, and reports