System Design (HLD) Syllabus

Module 1: Foundation & Basics (Theory + Mini Use Cases)

S.NO.	Topic
1	What is System Design? Goals, Trade-Offs, protocols
2	CAP Theorem + Consistency vs Availability
3	Architecture Patterns : Monolith vs Microservices
4	HLD Approach: Interview Framework & Thinking Process
5	Load Balancing + Horizontal vs Vertical Scaling
6	Consistent Hashing
7	Caching (Types, When/Where/Why)
8	Database Design (SQL vs NoSQL, Sharding, Indexing)
9	Messaging Queues, Pub-Sub, Kafka, Rabbit-MQ etc
10	Scaling to Millions of Users

Module 2: Real-World Features with Concepts

S.NO.	Topic
11	Designing Authentication & Authorization
12	Rate Limiting & API Gateway
13	Building Rate Limiter (Leaky/Token Bucket etc)
14	CDN + Static Content Delivery
15	Monitoring, Logging & Health Checks
16	Designing Search (Inverted Index, Ranking, Autocomplete)
17	Notification System (Email/SMS/Push)
18	Building File Upload System (Like Google Drive)

Module 3: Complete System Design Problems

S.NO.	Topic
19	Building URL Shortener like (Bit.ly)
20	Building Instagram Feed Design
21	Building Zomato/Swiggy
22	Building YouTube (Video Service)
23	Building WhatsApp/Chat App
24	Building Google Docs (Collaborative Editing)
25	Design Twitter