**Java Microservices assessment syllabus**

1. **MongoDB**

* CAP Theorem
* ACID vs. BASE Model
* RDBMS vs NoSQL
* Types of NoSQL databases
* Mongo basic queries
* Capped collections
* Aggregation Framework basics

1. **Spring Core**

* Spring Architecture
* Bean life cycle
* Different tags/attributes of beans.xml
* Autowiring

1. **Spring Boot**

* Spring Boot architecture
* Convention over configuration
* Spring boot initializer
* Spring boot starters
* Spring boot runners
* Spring boot annotations - @SpringBootApplication, @Configuration, @Component, @Bean, @Service

1. **Spring REST**

* What is REST?
* REST vs SOAP
* Annotations - @RestController, @RequestMapping, @GetMapping, @PostMapping, @PutMapping, @DeleteMapping, @PathVariable, @RequestParam, @RequestHeader, @CrossOrigin

1. **Content Negotiation**

* What is Content Negotiation?
* Setting content type & Accept in request header

1. **Swagger**

* What is API documentation?
* Introduction to Open API Specification with Swagger
* What is Docklet?
* How to customize a Docklet?
* Annotations - @ApiOperation, @ApiModel & @ApiModelProperty

1. **Spring Data**
   * Introduction to JPA
   * JPA Entity
   * JPA Entity Relationship (1-1, 1-M & M-M) - Cascade types, fetch type
   * JPA annotations - @Table, @Entity, @OneToOne, @OneToMany, @ManyToMany, @JoinColumn, @JoinTable, @Id, @Column, @GeneratedValue
   * Repository API interface hierarchy
   * CRUD, Sorting, Grouping operations with Repository API
   * Custom findBy methods
   * Writing JPQL
   * Spring MongoDB connectivity
2. **Spring Exception Handling**

* Handling exceptions in Spring Boot app
* Using @ResponseStatus
* Writing global exceptions
* Writing local exceptions in controller class
* Priorities in exception handling mechanism (Local exception, Global exception, @ResponseStatus, Server error)

1. **Spring Security**

* Basic terminologies (authentication, authorization, principal, granted authority & roles)
* Authentication flow in Spring Security
* Handling in memory authentication
* Handling authorization
* Handling database authentication using UserDetailsService
* JWT basics
* JWT structure
* JWT token creation & validation
* OAuth2 basics - resource owner, resource server, authorization server & client
* OAuth2 flow
* Implementing OAuth2 in Spring Boot app

1. **Eureka Server**

* Need of Eureka Server
* Configuring Eureka Server app
* Registering microservices into Eureka
* Eureka dashboard

1. **Config Server**

* Need of Config Server
* Moving microservices config to GITHUB
* How to create Config Server app?
* How to configure Microservice to connect Config Server?
* Using /actuator/refresh to refresh the microservice configuration

1. **Circuit Breaker**

* What is circuit breaker design pattern?
* Need of circuit breaker
* Circuit breaker states (OPEN, CLOSED, HALF OPEN)
* Resilience4J API
* Configuring circuit breaker with different properties
* Circuit breaker fallback method

1. **API Gateway**

* Need of API gateway
* Creating API-Gateway App
* Configuring URL patterns in application.yml

1. **Zipkin & Sleuth**

* What is distributed tracing?
* Need of distributed tracing
* Zipkin installation
* Zipkin dashboard with terms trace id, span & depth
* Connecting microservice with zipkin

1. **API versioning**

* What is API versioning?
* Need of versioning
* Implemening different types of API versioning (URI path parameter, request parameter, header parameter & content negotiation)

1. **Spring Profiles**

* What is Spring profile?
* Creating multiple spring profiles
* Using property "spring.profiles.active"
* Using @Profile annotation