# Spring, Maven & JPA Interview Questions & Answers (Simple 3-Line Format)

## Maven

**1) What is Maven and its advantage?**
Maven is a build automation and dependency management tool. It manages libraries and provides a standard project structure.

**2) What is groupId, artifactId in pom.xml?**
groupId is the unique ID of the organization, artifactId is the name of the project or module.

**3) What is POM?**
POM (Project Object Model) is the XML file (pom.xml) containing configuration, dependencies, and plugins.

**4) Maven Lifecycle phases, plugins, goals**
Phases: validate, compile, test, package, install, deploy. Plugins add features, goals are tasks executed by plugins.

## Spring

**1) What is a framework?**
A framework provides ready-made structure and reusable components for faster development.

**2) Features of Spring framework?**
Lightweight, dependency injection, modular, integrates with other frameworks, supports AOP and transactions.

**3) What is dependency injection and types?**
DI means dependencies are provided externally. Types: Constructor injection and Setter injection.

**4) Bean scopes and default scope?**
Scopes: singleton, prototype, request, session, global-session. Default scope is singleton.

**5) What is autowiring and modes?**
Autowiring automatically injects dependencies. Modes: no, byName, byType, constructor, autodetect.

**6) Stereotype annotations**
@Component, @Service, @Repository, @Controller — used to mark Spring-managed classes.

**7) Explain Spring MVC**
Spring MVC is a Model-View-Controller web framework. DispatcherServlet handles requests and maps to controllers.

**8) Important annotations in Spring MVC**
@RequestMapping, @GetMapping, @PostMapping, @PathVariable, @RequestParam, @ModelAttribute.

**9) Advantages of Spring Boot?**
Auto-configuration, embedded servers, less XML, starter dependencies, and quick microservice development.

**10) Advantage of Spring JDBC over JDBC API?**
Spring JDBC reduces boilerplate code and handles resource management and exceptions automatically.

**11) Explain Spring AOP.**
AOP separates cross-cutting concerns like logging, security, and transaction management.

**12) What is webservice and types?**
Webservice allows apps to communicate over network. Types: SOAP and REST.

**13) What is REST?**
REST is an architecture using HTTP for communication, stateless and resource-based.

**14) Explain RESTful webservice and HTTP verbs.**
RESTful webservices expose resources via URIs. HTTP verbs: GET, POST, PUT, DELETE.

**15) What is content negotiation in REST API?**
It allows client to request response format (JSON, XML) using headers.

**19) Common Spring annotations**
@Configuration, @Bean, @Autowired, @Qualifier, @Value, @Component, @Service, @Repository, @Controller, @RestController.

**20) What is Spring Security?**
Spring Security provides authentication, authorization, and protection against CSRF and XSS attacks.

## Spring JPA

**1) What is ORM framework?**
ORM maps Java objects to database tables automatically and reduces SQL code.

**2) What is Spring JPA and advantages?**
Spring Data JPA simplifies database access, reduces boilerplate, and integrates with Hibernate.

**3) Annotations in Spring JPA**
@Entity, @Table, @Id, @GeneratedValue, @Column, @OneToOne, @OneToMany, @ManyToOne, @ManyToMany.

**4) Difference between CrudRepository, JpaRepository, PagingAndSortingRepository**
CrudRepository → CRUD ops, PagingAndSortingRepository → CRUD + pagination/sorting, JpaRepository → full JPA features.

**5) Relationship between entity classes**
One-to-One, One-to-Many, Many-to-One, Many-to-Many relationships are supported.

**8) Fetch types in Spring JPA**
Two fetch types: EAGER (loads immediately) and LAZY (loads on demand).

**9) Hibernate caching types**
First-level (session), Second-level (SessionFactory), Query cache (optional).

**10) What is JPQL?**
JPQL is object-oriented query language similar to SQL but works with entities.

**11) Explain JPA, Hibernate, Spring Data JPA**
JPA is a specification, Hibernate is an implementation, Spring Data JPA simplifies usage of both.