151. What does scaling mean in microservices?

Scaling means handling more load by adding resources.
- Vertical: Add RAM/CPU to one instance
- Horizontal: Add more instances

152. Why is scaling important in microservices?

To maintain performance, ensure high availability, and independently scale services based on demand.

153. What is containerization?

Packaging an app and its dependencies into a single unit called a container using tools like Docker.

154. What is Docker?

A container platform to run and manage applications with all their dependencies, ensuring consistency across environments.

155. What are the benefits of using containers in microservices?

- Portability
- Isolation
- Fast deployment
- Efficient resource usage
- Easy scaling

156. What is a Dockerfile?

A file with instructions to build a Docker image. Example:
FROM openjdk:17
COPY target/app.jar app.jar
ENTRYPOINT ["java", "-jar", "app.jar"]

157. What is Kubernetes?

An open-source system to automate deployment, scaling, and management of containerized applications.

158. Key components of Kubernetes:

- Pod: Smallest unit with 1+ containers
- Service: Exposes pods
- Deployment: Rollouts
- ReplicaSet: Pod count

- ConfigMap/Secret: External config

159. How does Kubernetes help in microservices?

Manages scaling, healing, networking, and updates for containers automatically.

160. What is Helm in Kubernetes?

A package manager for Kubernetes used to define, install, and upgrade K8s apps using charts.

161. What is CI/CD in microservices?

CI = Continuously test and integrate code
CD = Automatically deploy changes to staging/production environments

162. Benefits of CI/CD in microservices:

- Faster delivery
- Fewer bugs
- Automated builds/tests/deployments
- Shorter feedback loop

163. Tools for CI/CD in microservices?

- Jenkins, GitHub Actions, GitLab CI
- ArgoCD, Spinnaker
- CircleCI, AWS CodePipeline

164. What is a blue-green deployment?

Switch between two environments (Blue: live, Green: new). Swap traffic after validation for zero downtime.

165. What is a canary deployment?

Roll out new version to a small subset of users. If stable, roll out to all. Reduces blast radius of bugs.