Kubernetes Interview Questions and Answers

Q: What is Kubernetes?

A: Kubernetes is an open-source container orchestration platform for automating deployment, scaling, and management of containerized applications.

Q: What are the main components of Kubernetes architecture?

A: 1. Master Node (API Server, Scheduler, Controller Manager, etcd)

2. Worker Node (Kubelet, Kube-proxy, Container Runtime)

Q: What is a Pod in Kubernetes?

A: A Pod is the smallest deployable unit in Kubernetes that can contain one or more containers. All containers in a Pod share the same network namespace and storage.

Q: What is the difference between a Pod and a Container?

A: A container is a runtime instance of a container image. A Pod is a higher-level structure that may wrap one or more containers.

Q: What is a Node in Kubernetes?

A: A Node is a worker machine in Kubernetes where containers are deployed. It can be a VM or a physical machine.

Q: What is a Namespace and why is it used?

A: Namespaces are virtual clusters within a Kubernetes cluster, used to divide resources among multiple users or teams.

Q: What is a Kubelet?

A: Kubelet is an agent that runs on each worker node and ensures the containers are running in a Pod.

Q: What is the role of etcd in Kubernetes?

A: etcd is a distributed key-value store used as the Kubernetes backing store for all cluster data.

Q: What is the difference between Deployment and StatefulSet?

A: Deployment is used for stateless apps; StatefulSet is used for stateful apps with persistent identities and storage.

Q: How does Kubernetes achieve high availability?

A: By using multiple replicas of the control plane and pods, load balancing, health checks, and self-healing mechanisms.

Q: What is a ReplicaSet? How is it different from Deployment?

A: ReplicaSet ensures a specified number of Pod replicas are running. Deployment manages ReplicaSets and provides rolling updates.

Q: How does Horizontal Pod Autoscaling work?

A: It automatically scales the number of Pods based on CPU/memory usage or custom metrics.

Q: Explain the lifecycle of a Pod.

A: Pending -> Scheduled -> Running -> Succeeded/Failed. Kubernetes tracks Pod phases and restarts if needed.

Q: What are DaemonSets and when would you use them?

A: DaemonSets ensure a copy of a Pod runs on every node. Useful for logging or monitoring agents.

Q: What is a Job vs a CronJob in Kubernetes?

A: Job runs a task to completion. CronJob runs Jobs on a schedule (like cron).

Q: What is a Service in Kubernetes?

A: A Service exposes a set of Pods as a network service. It provides stable access to ephemeral Pods.

Q: Types of Services in Kubernetes?

A: ClusterIP, NodePort, LoadBalancer, and ExternalName. Each exposes Pods differently.

Q: What is Ingress?

A: Ingress manages external access to services, typically HTTP. It provides routing rules and SSL termination.

Q: What is a NetworkPolicy?

A: NetworkPolicy controls the network access between Pods at the IP and port level.

Q: What is kube-proxy and how does it work?

A: kube-proxy maintains network rules on nodes, routing traffic to appropriate Pods.