

# CKA Practice Test

## 1. What is the smallest deployable unit in Kubernetes?

Answer: A Pod is the smallest deployable unit consisting of one or more containers.

## 2. Which component stores all cluster data?

Answer: etcd stores persistent key-value data for the cluster.

## 3. Name two control plane components besides the API Server.

Answer: Scheduler and Controller Manager are two control plane components.

## 4. What does the kubelet do on a node?

Answer: The kubelet ensures containers described in PodSpecs are running on its node.

## 5. How many worker nodes must a Kubernetes cluster have?

Answer: At least one worker node must be present in a cluster.

## 6. How do you create a Pod imperatively?

Answer: Use `kubectl run <name> --image=<image> --restart=Never`

## 7. What Kubernetes object manages pod replicas and rolling updates?

Answer: A Deployment manages ReplicaSets to perform rolling updates.

## 8. Which command scales a Deployment to 5 replicas?

Answer: `kubectl scale deployment/<name> --replicas=5`

## 9. How do you perform a rollback on a Deployment?

Answer: `kubectl rollout undo deployment/<name>`

## 10. What is the purpose of readiness probes?

Answer: They tell the kubelet when a container is ready to accept traffic.

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## 11. What differentiates a StatefulSet from a Deployment?

Answer: StatefulSets provide stable network IDs and ordered, graceful scaling.

## 12. When would you use a DaemonSet?

Answer: To run a copy of a pod on every node, e.g., for log collection or monitoring.

## 13. Which controller runs a job to completion once?

Answer: A Job controller runs pods to completion.

## 14. How do you define a CronJob schedule?

Answer: Using a crontab-like schedule in the spec.scheduled field.

## 15. Name the object that ensures a specified number of Pods run.

Answer: ReplicaSet ensures a specified number of identical pods are running.

## 16. Which Service type exposes pods only within the cluster?

Answer: ClusterIP exposes a Service on an internal IP.

## 17. How do you expose a Deployment via NodePort?

Answer: `kubectl expose deployment <name> --type=NodePort --port=80 --target-port=80`

## 18. What resource manages HTTP routing rules?

Answer: An Ingress defines rules for routing external HTTP(S) traffic.

## 19. What is a LoadBalancer Service?

Answer: It provisions an external load balancer from the cloud provider.

## 20. True or False: Ingress requires an Ingress Controller.

Answer: True: an ingress controller must be installed to implement Ingress resources.

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## 21. What is a PersistentVolume?

Answer: A PersistentVolume is a storage resource provisioned by an administrator.

## 22. How does a pod claim persistent storage?

Answer: Using a PersistentVolumeClaim that requests size and access mode.

## 23. Which object stores non-sensitive configuration?

Answer: ConfigMap holds configuration data as key-value pairs.

## 24. Why would you use a Secret instead of a ConfigMap?

Answer: Secrets are intended to store sensitive data such as passwords and tokens.

## 25. What access mode allows a volume to be mounted on a single node?

Answer: ReadWriteOnce allows read/write access by a single node.

## 26. What is the difference between resource requests and limits?

Answer: Requests determine scheduling while limits cap resource usage.

## 27. Which QoS class has no resource requests or limits?

Answer: BestEffort has no requests or limits.

## 28. What does a liveness probe do?

Answer: It detects when a container is stuck and should be restarted.

## 29. Which command shows CPU and memory usage of pods?

Answer: kubectl top pods (requires metrics server).

## 30. What is an OOMKill?

Answer: It occurs when a container exceeds its memory limit and is terminated.

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**31. How do you constrain a Pod to run on nodes with a specific label?**

Answer: Use nodeSelector or nodeAffinity in the Pod spec.

**32. What is the purpose of taints and tolerations?**

Answer: They repel or allow pods to be scheduled on specific nodes.

**33. Which affinity type spreads pods across different nodes?**

Answer: podAntiAffinity can spread pods to avoid co-location.

**34. What command applies a taint to a node?**

Answer: `kubectl taint nodes <node> key=value:effect`

**35. True or False: nodeSelector supports OR conditions.**

Answer: False: nodeSelector only supports match on all labels.

**36. What does HPA stand for?**

Answer: Horizontal Pod Autoscaler.

**37. Which metric is commonly used for HPA scaling?**

Answer: Average CPU utilization percentage.

**38. What does VPA adjust?**

Answer: Vertical Pod Autoscaler adjusts resource requests and limits.

**39. Name the component that adds or removes nodes based on pending pods.**

Answer: Cluster Autoscaler.

**40. What is Karpenter?**

Answer: A node provisioning tool that rapidly launches nodes based on workload requirements.

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**41. What is a RoleBinding?**

Answer: It grants permissions defined in a Role to subjects within a namespace.

**42. How do you create a service account?**

Answer: `kubectl create serviceaccount <name>`

**43. What label enforces the restricted pod security profile?**

Answer: `pod-security.kubernetes.io/enforce=restricted`

**44. Why are Secrets base64-encoded?**

Answer: Base64 encoding is required by the Kubernetes API, but does not provide encryption.

**45. True or False: ClusterRoleBindings are namespace-scoped.**

Answer: False: ClusterRoleBindings grant cluster-wide permissions.

**46. What is Helm used for?**

Answer: Helm is a package manager for Kubernetes resources.

**47. How do you list installed charts?**

Answer: `helm list`

**48. What is an operator?**

Answer: A custom controller that manages application-specific resources.

**49. Which command shows logs of a pod?**

Answer: `kubectl logs <pod>`

**50. What port does Grafana typically run on when using the Prometheus community chart?**

Answer: Grafana listens on port 3000 when forwarded locally.