**Questions**

At the end of each chapter, you’ll find recap questions that allow to test your understanding. Questions might have multiple correct answers. Correct answers can be found in the Assessment section of the Appendix:

1. Which of the following describes traditional deployments on physical servers (pick two)?
2. Easy maintenance
3. Underutilized hardware
4. Low energy consumption
5. High upfront costs
6. Which advantages do VMs have compared to containers?
7. They are more reliable
8. They are more portable
9. They are more secure
10. They are more lightweight
11. What describes the difference between VMs and containers (pick two)?
12. VM images are small and container images are large
13. VM images are large and container images are small
14. VMs share the OS kernel and containers don’t
15. Containers share the OS kernel and VMs don’t
16. At which level do containers operate?
17. The orchestrator level
18. The hypervisor level
19. The programming language level
20. The OS level
21. What is typically included in a container image (pick two)?
22. An OS kernel
23. A minimal set of OS libraries and packages
24. A graphical desktop environment
25. A packaged microservice
26. Which advantages do containers have compared to VMs (pick multiple)?
27. They are more secure
28. They are more lightweight
29. They are more portable
30. They are faster to start
31. Which software is needed to start and run containers?
32. A container runtime
33. A hypervisor
34. Kubernetes
35. VirtualBox
36. Which of the following can be used to orchestrate containers?
37. containerd
38. CRI-O
39. Kubernetes
40. Serverless
41. Which of the following is a cloud service delivery model (pick multiple)?
42. IaaS, PaaS
43. SaaS, FaaS
44. DBaaS
45. Serverless
46. Which of the following statements about cloud-native is true?
47. It is an architectural approach
48. It is the same as a cloud provider
49. It is similar to cloud-first
50. It is software that only runs in the cloud
51. Which of the following descriptors applies to cloud-native applications (pick two)?
52. High degree of automation
53. High scalability and resiliency
54. Can only run in a private cloud
55. Can only run in a public cloud
56. Which of the following statements is true about monolithic applications?
57. They are easy to update
58. Their components communicate with each other over the network
59. They include all the business logic and interfaces
60. They can be scaled easily
61. Which of the following statements is true for microservices (pick multiple)?
62. They can only be used for the backend
63. They work together as a part of a bigger application
64. They can be developed by multiple teams
65. They can be deployed independently
66. Which of the following can be done with Kubernetes (pick multiple)?
67. Self-healing in case of failure
68. Autoscaling containers
69. Spawning VMs
70. Scheduling containers on different hosts
71. Which project served as an inspiration for Kubernetes?
72. OpenStack
73. Docker
74. Borg
75. OpenShift

As we conclude, here is a list of questions for you to test your knowledge regarding this chapter’s material. You will find the answers in the Assessments section of the Appendix:

1. Which of the following is a valid project maturity state in CNCF (pick multiple)?
2. Sandbox
3. Released
4. Graduated
5. Incubating
6. Which organization was started to establish industry standards for containers?
7. Open Container Foundation
8. Cloud Native Container Initiative
9. Cloud Native Container Foundation
10. Open Container Initiative
11. Which of the following requirements must a CNCF project meet to reach the Graduated state (pick multiple)?
12. Have project development and maintenance plan for the next 3-5 years
13. Have real users and defined governance and committer processes
14. Have contributors from multiple organizations
15. Follow Core Infrastructure Initiative best practices
16. Which of the following CNCF bodies determines if a project has reached another maturity level?
17. End User Community (EUC)
18. Governing Board (GB)
19. Technical Oversight Committee (TOC)
20. Technical Overview Committee (TOC)
21. Which of the following specifications is provided by the OCI (pick multiple)?
22. Image specification
23. Runtime specification
24. Execution specification
25. Distribution specification
26. Which of the following is required for a CNCF project at any maturity stage (pick two)?
27. Acceptance of the CNCF Code of Conduct
28. Acceptance of the CNCF IP Policy
29. Acceptance of the GNU GPL v.3 license
30. Acceptance of the Linux Foundation as the project owner
31. Which of the following does DevOps culture emphasize (pick multiple)?
32. Shared responsibility
33. Learning instead of blame
34. Strong cross-team collaboration
35. Developers should follow the Operations team
36. Which of the following organizations was founded with a mission to advance container and cloud-native technologies and align the industry?
37. Linux Foundation
38. Open Container Initiative
39. Cloud Native Container Foundation
40. Cloud Native Computing Foundation
41. Which of the following is likely to be among the Cloud Architect’s responsibilities (pick two)?
42. Selecting a cloud provider and suitable services
43. Designing the cloud infrastructure architecture
44. Deploying applications to production
45. Maintaining applications in the cloud
46. What is the difference between DevOps and DevSecOps Engineers?
47. DevOps only takes care of operations
48. DevSecOps only takes care of security aspects
49. DevSecOps is like DevOps, but with an extra focus on security
50. DevSecOps must have security-related certifications
51. Which of the following describes SRE (pick two)?
52. SRE needs to be present on-site with the cloud providers
53. SRE does not participate in any operations
54. SRE works on maintaining and optimizing infrastructure and apps
55. SRE needs to ensure that the application’s SLA and SLO are met
56. How are Cloud Engineers different from DevOps Engineers (pick two)?
57. DevOps Engineers know nothing about the cloud
58. Cloud Engineers have a deeper knowledge of cloud services
59. DevOps Engineers often have a broader skill set
60. DevOps Engineers need to do on-call duty, while Cloud Engineers don’t
61. What are the benefits of having Full-Stack developers in a team?
62. Full-Stack can tackle both frontend and backend work
63. Full-Stack developers deploy applications to the cloud
64. Full-Stack developers write code faster
65. Full-Stack developers write cleaner code
66. Why is it important to have Open Standards (pick two)?
67. They help us avoid vendor lock-in
68. They allow different software to be compatible
69. They ensure bug-free software
70. They prevent earning profits with software
71. Which of the following technologies is a DevOps Engineer likely to work with (pick multiple)?
72. Frontend technologies (for example, JavaScript, HTML, and CSS)
73. Automation tools (for example, Terraform, Ansible, and Puppet)
74. CI
75. CD

As we conclude, here is a list of questions for you to test your knowledge regarding this chapter’s material. You will find the answers in the Assessments section of the Appendix:

1. Which of the following features describes containers (pick two)?
2. Portability between environments
3. Large image size
4. Small image size
5. High security
6. Which of the following is true (pick two)?
7. Applications are easy to package in containers
8. Applications are easy to package in virtual machines
9. Container images are easy to share
10. VM images are easy to share
11. What programming language do developers have to learn to run their code in containers?
12. Dockerlang
13. Golang
14. Python
15. None – containers allow the same languages that are supported by the OS environment
16. Which of the following problems do containers address (pick two)?
17. Unmet dependencies between environments
18. Bugs in application code
19. Need to test application code
20. Long VM startup times
21. Which of the following is used by containers (pick two)?
22. cgroups
23. hwmon
24. acpi
25. kernel namespaces
26. Which of the following can be used to share container images (pick two)?
27. Docker Hub
28. Docker Swarm
29. Docker Registry
30. Docker Compose
31. Which of the following is true about container images (pick two)?
32. They can only be built with Dockerfiles
33. They include immutable filesystem layers
34. The newest image is always tagged as the latest
35. They can be built interactively
36. Which of the following applies when starting a new container (pick two)?
37. A new writable filesystem layer is created
38. The requested image is always pulled
39. An image is pulled if the requested tag (SHA digest) is not found locally
40. A new Linux kernel is loaded
41. Which of the following is true about container image tags (pick two)?
42. Every image must have tags
43. The latest tag is applied automatically on build, unless overridden
44. The same image cannot have multiple tags
45. The same image can have multiple names (repositories) and tags
46. How can a new container be created using Docker tooling?
47. docker run
48. docker exec
49. docker spawn
50. docker launch

As we conclude, here is a list of questions for you to test your knowledge regarding this chapter’s material. You will find the answers in the Assessments section of the Appendix:

1. Which of the following is software responsible for starting and stopping containers?
2. Container hypervisor
3. Container daemon
4. Kubernetes
5. Container runtime
6. Which of the following are valid types of containers (pick multiple)?
7. Hyperspaced
8. Sandboxed
9. Namespaced
10. Virtualized
11. Which of the following is an example of sandboxed containers?
12. Kata
13. gVisor
14. Docker
15. containerd
16. Which of the following is an example of virtualized containers?
17. Docker
18. containerd
19. gVisor
20. Kata
21. Which of the following allows you to use different container runtimes with Kubernetes?
22. CSI
23. SMI
24. CNI
25. CRI
26. Which of the following allows you to use different service meshes with Kubernetes?
27. CRI
28. SMI
29. CNI
30. CSI
31. Why are Namespaced containers considered less secure?
32. They use old kernel features
33. They need Kubernetes to run
34. They share a host kernel
35. They share a host network
36. Which container type is considered the most lightweight and fast?
37. Virtualized
38. Sandboxed
39. Namespaced
40. Hyperspaced
41. Which of the following storage solutions can be used with Kubernetes?
42. Any that supports NFS v4.1
43. Any that is CSI compatible
44. Any that is CNI compatible
45. Any third-party cloud provider storage
46. What has to be changed in the application code for the service mesh to work?
47. The application has to be rewritten in Golang
48. The application needs to expose the SMI
49. The application has to be stateless
50. No application changes needed
51. Which of the following is a feature of a service mesh (pick multiple)?
52. mTLS
53. Traffic management
54. Observability
55. Traffic compression
56. Which component does the service mesh data plane include?
57. Lightweight network firewall
58. Lightweight network proxy
59. Lightweight load balancer
60. Lightweight web server
61. Which of the following is a service mesh (pick multiple)?
62. Istio
63. Prometheus
64. Falco
65. Linkerd
66. Which of the following is considered best practice when it comes to container security (pick multiple)?
67. Run the application as UID=0
68. Scan container images for vulnerabilities
69. Run the application as non-root
70. Run containers with Kubernetes
71. Which of the following technologies can be used to improve container security (pick multiple)?
72. AppArmor
73. Ansible
74. SELinux
75. Firewalld
76. Which potential problems can you encounter when using public container registries (pick multiple)?
77. Third-party images might be deleted at any time
78. Third-party images might fail to download due to rate limiting
79. Third-party images might contain malware
80. Third-party images might work in development but fail in production
81. Which containers can Kubernetes spawn?
82. Namespaced containers
83. K8s does not spawn containers; the runtime does
84. Virtualized containers
85. Sandboxed containers
86. What is typically used for multi-host container networking?
87. IPtables
88. CNI
89. Service mesh
90. Overlay network

As we conclude, here is a list of questions for you to test your knowledge regarding this chapter’s material. You will find the answers in the Assessments section of the Appendix:

1. Which of the following is the smallest schedulable unit in Kubernetes?
2. Container
3. Sidecar
4. Pod
5. Deployment
6. Containers running in one pod share which of the following options (pick multiple)?
7. Name
8. Storage
9. Networking
10. Memory
11. Which of the following types of nodes does Kubernetes have (pick multiple)?
12. Secondary
13. Master
14. Worker
15. Primary
16. Which of the following are components of control plane nodes (pick multiple)?
17. Docker, kube-scheduler, cloud-controller-manager
18. kube-master-server, kubelet, kube-proxy
19. kube-scheduler, kube-controller-manager
20. kube-api-server, etcd
21. Which of the following K8s cluster configuration can be recommended?
22. 1 master node, 5 worker nodes
23. 2 master nodes, 3 worker nodes
24. 2 master nodes, 20 worker nodes
25. 3 master nodes, 10 worker nodes
26. Which of the following components are used to store cluster state in Kubernetes?
27. kube-api-server
28. kube-volume
29. kubelet
30. etcd
31. Which of the following components is used by Kubernetes to download images and start containers?
32. Kubelet
33. Container runtime
34. etcd
35. kube-proxy
36. Which of the following components is responsible for Kubernetes controller processes?
37. kube-api-server
38. kube-proxy
39. kube-controller-manager
40. kube-scheduler
41. What can be used to access the Kubernetes API (pick multiple)?
42. kubeadmin
43. kubectl
44. kubelet
45. dashboard
46. Kubernetes has a declarative API. What does this mean?
47. We always need to declare a YAML spec file to use the K8s API
48. We declare the desired state and K8s will reach it once
49. We tell Kubernetes exactly what to do with which resource
50. We declare the desired state and K8s will constantly try to reach it
51. Which of the following Kubernetes API versions are enabled by default (pick multiple)?
52. Alpha
53. Beta
54. Gamma
55. Stable
56. How can you extend the Kubernetes API with new features (pick multiple)?
57. Code Resource Definitions
58. Aggregation layers
59. Extension layers
60. Custom Resource Definitions
61. Which of the following projects allows you to extend Kubernetes beyond container orchestration (pick multiple)?
62. Knative for FaaS
63. Linkerd for IPAM
64. Kvirt for VM orchestration
65. KubeVirt for VM orchestration
66. What helps detect the difference between the current and desired state of Kubernetes resources?
67. Container runtime
68. Kubernetes scheduler
69. Custom Resource Definition
70. Reconciliation loop
71. What are secondary containers running in pod called?
72. Flatcars
73. Sidecars
74. Podcars
75. Helpcars
76. Which of the following formats is used to write Kubernetes spec files?
77. CSV
78. Protobuf
79. YAML
80. Marshal
81. Which of the following Kubernetes components is responsible for allocating new pods to nodes?
82. kube-api
83. kube-proxy
84. kube-scheduler
85. kube-controller-manager
86. Which of the following K8s CLI commands can be used to list pods in the development namespace?
87. kubectl list pods -n development
88. kubectl get pods --namespace development
89. kubectl show pods --namespace development
90. kubectl get pods --all-namespaces
91. Which of the following K8s CLI commands can be used to list all the namespaces in the cluster?
92. kubectl list namespaces --all-namespaces
93. kubectl show namespaces
94. kubectl get namespaces
95. kubectl get all
96. Which of the following pod statuses means its container(s) are currently executing?
97. Executing
98. Succeeded
99. Running
100. ContainerCreated

21. Which of the following pod statuses means all its containers are running (pick multiple)?

1. 100%
2. 1/2
3. 2/2
4. 1/1

As we conclude, here is a list of questions for you to test your knowledge regarding this chapter’s material. You will find the answers in the *Assessments* section of the *Appendix*:

1. Which of the following Kubernetes resources allows you to recover an application if the node it was running on has failed (select multiple)?
   1. Pod
   2. Service
   3. StatefulSet
   4. Deployment
2. Which of the following Kubernetes resources ensures that the defined number of replicas are always running (select multiple)?
   1. Pod
   2. ReplicaSet
   3. Deployment
   4. DaemonSet
3. Which of the following Kubernetes resources allows us to perform rolling updates and zero-downtime deployments?
   1. Service
   2. Deployment
   3. ReplicaSet
   4. DeploySet
4. Which statement best describes the relationship between Pods and various Kubernetes controllers (resources)?
   1. Pods are managing the resources
   2. Pods are managed by the container runtime
   3. Pods are always managed by one of the Kubernetes controllers
   4. Pods can be managed by one of the Kubernetes controllers
5. What is the purpose of label selectors?
   1. They help to determine the purpose of each pod in the cluster
   2. They help to distinguish more important Pods from less important ones
   3. They are simply auxiliary metadata
   4. They allow us to group and select resources by labels
6. Which of the following image pull policies will cause a download from the registry only when the image is not already cached on the node?
   1. **IfNotCached**
   2. **IfNotPresent**
   3. **IfNotAvailable**
   4. **Always**
7. How does a Service determine the Pods that are ready to accept traffic?
   1. Pods that are ready will have the **ready: true** label on them
   2. Only Pods managed by Deployment can accept traffic from a Service
   3. A pod’s readiness probe has to succeed
   4. A pod’s startup probe has to succeed
8. Which type of probe delays the execution of other probes?
   1. Delayed
   2. Liveness
   3. Startup
   4. Readiness
9. Which spec setting controls the number of Pods managed by a Deployment?
   1. podnum
   2. Replicas
   3. Containers
   4. Instances
10. Which Kubernetes controller is best suited for applications that need to save data to disk?
    1. **Deployment**
    2. **DaemonSet**
    3. **ReplicaSet**
    4. **StatefulSet**
11. Which of the following allows Kubernetes controllers to detect drift from the desired state?
    1. Replica controller
    2. Kubelet
    3. Reconciliation loop
    4. Liveness probes
12. Which type of service allows the exposure of applications inside the cluster?
    1. **LoadBalancer**
    2. **ClusterIP**
    3. **InternalIP**
    4. **NodePort**
13. Which technology is used behind service discovery in Kubernetes?
    1. Avahi
    2. Iptables
    3. NTP
    4. DNS
14. Which of the following service types are suitable for exposing applications outside of the Kubernetes cluster (select multiple)?
    1. **ClusterIP**
    2. **NodePort**
    3. **LoadBalancer**
    4. **ExternalIP**
15. Which of the following resources is suitable for storing and injecting generic configuration into containers?
    1. ConfigMap
    2. Secret
    3. SettingMap
    4. PV
16. Which object in Kubernetes represents an actual storage volume?
    1. StatefulSet
    2. PVC
    3. PV
    4. SV
17. Which resource is suitable for representing sensitive information to applications in containers?
    1. ConfigMap
    2. Secret
    3. Volume
    4. PVC
18. Which probe will restart the container if failed?
    1. Aliveness
    2. Readiness
    3. Startup
    4. Liveness

As we conclude, here is a list of questions for you to test your knowledge regarding this chapter’s material. You will find the answers in the Assessments section of the Appendix:

1. Which of the following stages are part of scheduling in Kubernetes (pick multiple)?

1. Spreading
2. Launching
3. Filtering
4. Scoring
5. What happens if the Kubernetes scheduler cannot assign a pod to a node?
6. It will be stuck in a CrashLoopBackOff state
7. It will be stuck in a Pending state
8. It will be stuck in a NotScheduled state
9. It will be forcefully run on one of the control plane nodes
10. Which of the following scheduler instructions will not prevent a pod from being scheduled if a condition cannot be satisfied (soft affinity or soft anti-affinity)?
11. requiredDuringSchedulingIgnoredDuringExecution
12. preferredDuringSchedulingIgnoredDuringExecution
13. neededDuringSchedulingIgnoredDuringExecution
14. softAffinity
15. Which Kubernetes scheduler feature should be used to control how Pods are spread across different failure domains (such as AZs, nodes, and so on)?
16. Pod failure domain constraints
17. Pod topology spread constraints
18. podAntiAffinity
19. nodeName
20. What is the purpose of podAffinity in Kubernetes?
21. To schedule Pods to certain nodes in the cluster
22. To group two or more Pods together for better performance
23. To schedule Pods to nodes where other Pods already running
24. To schedule Pods to different nodes where other Pods already running
25. What is the purpose of resource requests in Kubernetes?
26. They help to plan ahead the cluster extension
27. They define more important workloads in the cluster
28. They are needed to pick the right hardware in the cluster for the workload
29. They are needed for optimal pod placement in the cluster
30. What happens if a container has a memory limit of 500Mi set but tries to allocate 550Mi?
31. 550Mi is within a 10% margin, so the container will allocate memory normally
32. Pods have higher limits than containers, so memory allocation will work
33. The container process will be killed with an OOM error
34. The container process will be stuck when it gets over 500Mi
35. What will be the value of the container CPU request if the limit is set to 1.5 and there are no defaults for that namespace?
36. 0.0
37. 0.75
38. 1.5
39. 1.0
40. What happens with a pod if its containers request a total of 10.0 CPU units, but the largest node in the cluster only has 8.0 CPUs?
41. Requests are not hard requirements; the pod gets scheduled
42. Requests are hard requirements; the pod will be stuck in a Pending state
43. Because of the preferredDuringScheduling option, the pod gets scheduled anyway
44. The pod will be in a CrashLoopBackOff state due to a lack of resources in the cluster
45. Which logging level typically provides maximum verbosity for debugging purposes?
46. INFO
47. ERROR
48. MAXIMUM
49. DEBUG
50. What does cluster-level logging mean for log storage in Kubernetes?
51. K8s aggregates all cluster logs on control plane nodes
52. K8s needs separate log collection and aggregation systems
53. K8s provides a complete log storage and aggregation solution
54. K8s provides storage only for the most important cluster health logs
55. What do node logging agents in Kubernetes do (pick multiple)?
56. Collect logs only from worker nodes
57. Collect logs from all nodes
58. Send logs from worker nodes to control plane nodes
59. Send logs for aggregation and storage to a logging backend
60. What is the purpose of logging sidecar agents in Kubernetes?
61. To collect and stream logs from applications that cannot log to stdout and stderr
62. To provide a backup copy of logs in case of a node failure
63. To allow logging on verbosity levels such as ERROR and DEBUG
64. To enable the kubectl logs command to work
65. Which of the following kubectl commands allows us to run an arbitrary process in a container?
66. kubectl run
67. kubectl start
68. kubectl exec
69. kubectl proc
70. Which of the following commands will return logs from a pod container that has failed and restarted?
71. kubectl logs POD\_NAME --previous
72. kubectl logs POD\_NAME
73. kubectl previous logs POD\_NAME
74. kubectl logs
75. Which Kubernetes scheduler feature provides a simple way to constrain Pods to nodes with specific labels?
76. kubectl local
77. nodeConstrain
78. nodeSelector
79. nodeName

As we conclude, here is a list of questions for you to test your knowledge regarding this chapter’s material. You will find the answers in the Assessments section of the Appendix:

* 1. Which of the following is another name for pod-to-pod network traffic?

1. East-South
2. North-East
3. East-West
4. North-South
   1. What can be applied to restrict pod-to-pod traffic?
5. PodPolicy
6. PodSecurityPolicy
7. TrafficPolicy
8. NetworkPolicy
   1. Which layers are part of the 4Cs of Cloud Native security?
9. Cloud, Collocations, Clusters, Code
10. Cloud, Clusters, Containers, Code
11. Cloud, Collocations, Containers, Code
12. Code, Controllers, Clusters, Cloud
    1. Pod A is running in Namespace A and pod B is running in Namespace B. Can they communicate via their IP addresses?
13. No, because different namespaces are isolated with a firewall
14. Yes, but only if they are running on the same worker node
15. Yes, if not restricted with NetworkPolicy
16. No, because different namespaces have different IP Classless Inter-Domain Routing (CIDR) blocks
    1. How do two containers in the same pod communicate?
17. Via a network policy
18. Via localhost
19. Via the NodeIP Service
20. Via the ClusterIP Service
    1. Which of the following service types is typically used for internal pod-to-pod communication?
21. InternalIP
22. LoadBalancer
23. ClusterIP
24. NodePort
    1. What can be used to encrypt pod-to-pod communication in a cluster?
25. NetworkPolicy
26. Service mesh
27. EncryptionPolicy
28. Security Service
    1. Which of the following container types provides maximum isolation?
29. Virtualized
30. Namespaced
31. Isolated
32. Sandboxed
    1. What can be used to restrict access to the Kubernetes API?
33. Service mesh
34. Helm
35. Network policies
36. RBAC
    1. Why is it important to build your own container images?
37. Newly built images are often smaller in size
38. Due to copyrights and license restrictions
39. Newly built images always include the newest packages
40. Images found on the internet might include malware
    1. Which of the following can be used to provide fault tolerance for pods (pick multiple)?
41. Service
42. Deployment
43. Ingress
44. StatefulSet
    1. Why it is better to have three and not four control plane nodes?
45. Because four nodes consume too many resources; three is enough
46. An uneven number of nodes helps prevent split-brain situations
47. More nodes make the overlay pod network slower
48. More nodes introduce more operational burden for version upgrades
    1. Why is it not recommended to use pod IP addresses in ConfigMap configurations?
49. Because pods are ephemeral
50. Because the pod IP is not reachable from the internet
51. Because pods are using an old IPv4 protocol
52. Because it is hard to remember IP addresses
    1. What could be the reasons why a request forwarded to a running pod ends up in a timeout error (pick multiple)?
53. The Kubernetes API overloaded, affecting all pods
54. Network policy rules add additional network latency
55. A process in a pod is stuck and no livenessProbe is set
56. A process in a pod is still starting and no readinessProbe is set
    1. Which RBAC entity is used to give an identity to an application?
57. Role
58. ServiceAccount
59. RoleBinding
60. ServiceIdentity

As we conclude, here is a list of questions for you to test your knowledge regarding this chapter’s material. You will find the answers in the Assessments section of the Appendix:

1. Which of the following helps to get better resiliency with Kubernetes?
2. Resource requests
3. Multi-container pods
4. Reconciliation loop
5. Ingress controller
6. Which of the following Kubernetes autoscalers allows us to automatically increase and decrease the number of pods based on the load?
7. VPA
8. HPA
9. RPA
10. Cluster Autoscaler
11. Which of the following Kubernetes autoscalers adjusts container resource requests and limits based on statistical data?
12. VPA
13. HPA
14. RPA
15. Cluster Autoscaler
16. Why is it important to downscale the application and infrastructure?
17. To reduce the possible attack surface
18. To avoid hitting cloud provider limits
19. To reduce network traffic
20. To reduce costs when computation resources are idling
21. What best describes horizontal scaling?
22. Adding more CPU to the same service instance
23. Adding more replicas/instances of the same service
24. Adding more RAM to the same service instance
25. To schedule pods to different nodes where other pods already running
26. Which scaling approach is preferred for Cloud Native applications?
27. Cluster scaling
28. Cloud scaling
29. Vertical scaling
30. Horizontal scaling
31. Which of the following projects allow us to operate our own Serverless platform on Kubernetes (pick multiple)?
32. KubeVirt
33. KEDA
34. Knative
35. OpenFaaS
36. What characterizes Serverless computing (pick multiple)?
37. Servers are not needed anymore
38. It supports all programming languages
39. It is event-based
40. The provider takes care of server management
41. What is correct about scaling microservices?
42. Individual microservices can be scaled in and out
43. Only all microservices can be scaled in and out at once
44. Microservices do not need to be scaled—only the infrastructure needs to be
45. Microservices are best scaled up
46. Which application design principle works best with Cloud Native?
47. Self-healing
48. Tight coupling
49. Decoupling
50. Loose coupling
51. What describes a highly resilient application and infrastructure?
52. Ability to automatically shut down in case of issues
53. Ability to automatically recover from most failures
54. Ability to preserve the state in case of failure
55. Ability to perform rolling updates
56. What represents the smallest part of a Serverless application?
57. Gateway
58. Method
59. Container
60. Function
61. Which of the following is a correct statement about Serverless?
62. It is only billed for the actual usage
63. It is free as no servers are involved
64. It is billed at a constant hourly price
65. It is billed the same as IaaS services
66. Which of the following features do Cloud Native applications have (pick multiple)?
67. High scalability
68. High efficiency
69. High resiliency
70. High portability
71. What should normally be scaled in order to accommodate the load?
72. The application and the infrastructure it runs on
73. The load balancer and ingress
74. The number of application pods
75. The number of Kubernetes worker nodes
76. Which resiliency testing tool can be used to randomly introduce failures in the infrastructure?
77. Chaos Monster
78. Chaos Kube
79. Chaos Donkey
80. Chaos Monkey

Correct answers can be found at \_\_TBD\_\_

1. Which of the following are valid telemetry signals (pick multiple)?
2. Tracks
3. Pings
4. Logs
5. Metrics
6. Which is the dominant operation model of Prometheus for metrics collection?
7. Push
8. Pull
9. Commit
10. Merge
11. Which of the following allows to collect metrics with Prometheus when native application support is missing?
12. Running application in Kubernetes
13. Installing Pushgateway
14. Installing Alertmanager
15. Installing application exporter
16. Which of the following signals does Prometheus collect?
17. Logs
18. Metrics
19. Traces
20. Audits
21. Which component can be used to allow applications to push metrics into Prometheus?
22. Zipkin
23. Grafana
24. Alertmanager
25. Pushgateway
26. Which telemetry signal fits best to see how request traverses a microservice-base application?
27. Logs
28. Traces
29. Metrics
30. Pings
31. Which software allows visualizing metrics stored in Prometheus TSDB?
32. Zipkin
33. Kibana
34. Grafana
35. Jaeger
36. Which software can be used for end-to-end tracing of distributed applications (pick multiple)?
37. Prometheus
38. Grafana
39. Jaeger
40. Zipkin
41. What makes it possible to query Prometheus metrics from the past?
42. Alertmanager
43. TSDB
44. PVC
45. Graphite
46. Which endpoint Prometheus collects metrics from by default?
47. /collect
48. /prometheus
49. /metric
50. /metrics
51. What is the format of Prometheus metrics?
52. Timeseries
53. Traces
54. Spans
55. Plots
56. Which of the following allows direct instrumentation for applications to provide metrics in Prometheus format?
57. K8s service discovery
58. Pushgateway
59. Exporters
60. Client libraries
61. A periodic job takes only 30 seconds to complete, but Prometheus scrape interval is 60 seconds. What is the best way to collect the metrics from such job?
62. push the metrics to Pushgateway
63. reduce scrape interval to 30 seconds
64. reduce scrape interval to 29 seconds
65. replace job with Kubernetes CronJob
66. Which of the following is a crucial part of Rightsizing?
67. FinOps
68. Reserved instances
69. Autoscaling
70. Automation
71. Which of the following should be taken into consideration when implementing Autoscaling?
72. CPU utilization metric
73. RAM utilization metric
74. CPU + RAM utilization metrics
75. CPU, RAM, and application specific metrics
76. Which of the following instance types are offered by many public cloud providers (pick multiple)?
77. On-demand
78. Serverless
79. Spot
80. Reserved
81. Which of the following instance types fits for constant workloads with no spikes in load that should run for few years straight?
82. On-demand
83. Serverless
84. Spot
85. Reserved
86. Which of the following instance types fits for batch processing and periodic jobs that can be interrupted if lowest price is the main priority?
87. On-demand
88. Serverless
89. Spot
90. Reserved

**Correct answers can be found at \_\_TBD\_\_**

1. What does CI mean?
2. Continuous Interaction
3. Continuous Improvement
4. Continuous Integration
5. Continuous Inspection
6. Which of the following stages are the focus of CI automation (pick multiple)?
7. Release
8. Build, Test
9. Deploy
10. Package
11. Which of the following definitions are correct for CD (pick multiple)?
12. Continuous Debugging
13. Continuous Delivery
14. Continuous Destruction
15. Continuous Deployment
16. Which of the following is considered a CI/CD practice?
17. Frequent, large releases done by the whole team together
18. Frequent, small, and fully automated releases
19. Frequent, small, well tested, and automated releases
20. Infrequent, large, and automated releases
21. Which of the following tools are suitable for GitOps (pick multiple)?
22. Jenkins X
23. FluxCD
24. TravisCI
25. ArgoCD
26. Which of the following elements are a part of GitOps (pick multiple)?
27. Kubernetes
28. CI/CD
29. IaC
30. Merge (or pull) Requests
31. Which VCS is used with GitOps?
32. Bitbucket
33. Subversion
34. Git
35. Mercurial
36. What is infrastructure drift?
37. When the infrastructure is fully automated and can drift on autopilot
38. When the number of VMs in cloud has increased due to autoscaling events
39. When the performance of VMs varies during the day depending on demand
40. When the real infrastructure state is different from what is desired and defined by IaC
41. What should NOT be done with established GitOps process in team?
42. Monitoring the system state
43. Opening (pull) merge requests
44. Manual changes in the live environment
45. Reviewing teammate’s code as tests are automated
46. What is normally defined with IaC (pick multiple)?
47. System architecture
48. VMs and load balancers
49. Database migrations
50. Firewall rules
51. What are the benefits of GitOps (pick multiple)?
52. Faster and more stable software delivery
53. No need to monitor live environments anymore
54. More free time for the team due to high degree of automation
55. All Kubernetes operations are handled by CI/CD
56. What are the benefits of CI (pick multiple)?
57. Automatic deployment of tested code
58. Automatic packaging of tested code
59. No developer time spent for running builds or tests
60. Issue detection with automated tests
61. What is a correct definition of a release?
62. A version of software to be delivered to the users
63. A current state of application in K8s cluster
64. A decision to stop further development
65. A complete CI/CD pipeline run
66. Which of the following is a CI/CD tool?
67. CloudFormation
68. Terraform
69. GitlabCI
70. Subversion
71. What normally triggers a deployment in GitOps?
72. Push into any Git branch
73. An event of infrastructure drift
74. Approved and merged MR (PR)
75. Manual rebase in Git
76. Which of the following is true about GitOps (pick multiple)?
77. Overwrite of manual changes
78. It is only possible with Kubernetes
79. Uses declarative configuration
80. Can only be used with a few popular programming languages
81. Which of the following stages are NOT a part of CI/CD (pick multiple)?
82. Monitor
83. Build
84. Plan
85. Code

**Mock exam A**

Correct answers can be found in the Assessment section of the Appendix.

Note

Unless specified otherwise, there is only one correct answer.

1. You’re planning a deployment of a Kubernetes cluster in your organization. There is a requirement to make the control plane highly available. How many control plane nodes should be deployed?
2. 1
3. 2
4. 3
5. 4
6. You’re operating a Kubernetes cluster in a production environment where nodes are running in multiple failure domains (also called Availability Zones, or AZs). You need to ensure that Pods are started across predefined failure domains. Which K8s feature can be used?
7. PVC
8. Pod topology spread constraints
9. Pod network policies
10. Pod security policies
11. You’ve been asked to deploy a new application onto a Kubernetes cluster. Which check do you need to implement to constantly ensure that the application is healthy and running?
12. Prometheus probe
13. Container runtime check
14. Reconciliation check
15. Liveness and readiness probes
16. Which of the following kubectl commands can be used to get detailed information about a deployment named microservice-a?
17. kubectl get pod microservice-a
18. kubectl describe pod microservice-a
19. kubectl explain deployment microservice-a
20. kubectl describe deployment microservice-a
21. You are operating a Kubernetes cluster and have received a request to run a new application in containers that will reside in its own virtual machines (VMs), isolated from other workloads. Which technology would allow you to do that?
22. Namespaced container runtime
23. Virtualized container runtime
24. Sandboxed container runtime
25. Isolated container runtime
26. You’re deploying a new stateless microservice application into your Kubernetes cluster. The application must automatically recover from cluster node failures and should be updated regularly in a rolling fashion. Which K8s resource fits best for such a case?
27. StatelessSet
28. StatefulSet
29. ReplicaSet
30. Deployment
31. Which of the following is the smallest schedulable workload unit in Kubernetes?
32. Deployment
33. Container
34. Pod
35. Service
36. You’re deploying a new stateful application into your Kubernetes cluster that must persist data on the disk. Which Kubernetes controller will fit such a case?
37. ReplicaSet
38. Deployment
39. StatelessSet
40. StatefulSet
41. You’re operating several Kubernetes clusters, and in order to implement GitOps, you’ve started the evaluation of several tools. Which of the following is well suited for GitOps?
42. Argo CD
43. GitLab CI
44. Prometheus
45. Travis CI
46. You’re managing a Kubernetes cluster running in a big public cloud. The demand fluctuates often, and you need to automate the change of cluster size to add more worker nodes when demand is high and reduce the number when the load is low. Which technology would you use?
47. Self-healing
48. Horizontal Pod Autoscaler (HPA)
49. Vertical Pod Autoscaler (VPA)
50. Cluster Autoscaler (CA)
51. You’re debugging an application running in Kubernetes and you need to get the logs from a Pod called microservice-b that was just terminated. Which kubectl command allows you to do that?
52. kubectl get logs microservice-b
53. kubectl logs microservice-b --previous
54. kubectl logs microservice-b
55. kubectl get logs microservice-b --previous
56. You’re debugging an application in Kubernetes and need to check the logs from a container named app of the microservice-c Pod. How can you do that with kubectl?
57. kubectl logs microservice-c
58. kubectl get logs microservice-c app
59. kubectl get logs microservice-c
60. kubectl logs microservice-c -c app
61. You’re managing a Kubernetes cluster and need to run a logging agent on each node to ship the log to a centralized logging system. Which Kubernetes resource controller can be used for this logging agent?
62. DaemonSet
63. Deployment
64. StatefulSet
65. ReplicaSet
66. Which of the following is the main operational concept behind Kubernetes controllers?
67. Readiness probe
68. Serverless
69. Reconciliation loop
70. Rolling update
71. Which of the following projects can be used to implement your own Serverless platform? Pick two.
72. Knative
73. Prometheus
74. OpenFaaS
75. Jaeger
76. Which of the following technologies can be used to operate a virtualized container runtime with Kubernetes?
77. containerd
78. gVisor
79. Kata
80. Docker
81. You’ve been asked to deploy an application to Kubernetes that requires a small helper service running collocated with the main application. The helper service should share data on the disk with the main application. Which of the following resources can be used?
82. Two Pods with a network policy
83. Two Pods with an affinity policy
84. Pod with a single container
85. Pod with multiple containers
86. You’ve been asked to help with an application that is been migrated to Kubernetes. The application cannot output its logs to standard out (stdout) or standard error (stderr). What can be done in order to ship its logs to the central log aggregation system?
87. Nothing—the vendor should be asked to implement the feature first
88. The application should run inside the Pod with a PV attached for the logs
89. A logging agent should be run on all nodes as a DaemonSet
90. A logging sidecar container should be used in the Pod with the application
91. Which of the following formats is commonly used today for application logs?
92. CSV
93. JSON
94. YAML
95. SQL
96. As a part of the process improvement initiative in your organization, you are required to automate, test, and build procedures for several development teams. Which tools and processes would help if there is no need to automatically deploy the changes to various environments?
97. Tracing
98. GitOps
99. CD
100. CI/CD
101. Which of the following projects can be used to implement a service mesh? Pick two:
102. Linkerd
103. containerd
104. Istio
105. dockerd
106. You’ve just deployed a dedicated Kubernetes cluster for a new project, and you already have access to several other clusters. What needs to be done in order to access additional Kubernetes APIs from your workstation?
107. Add new credentials to the kubecon file
108. Add new credentials to the ssh-config file
109. Add new credentials to the kube-proxy file
110. Add new credentials to the kubeconfig file
111. You have been tasked to allow several development teams to use the same Kubernetes cluster. What can be done to logically separate their workloads from each other?
112. Let each team assign its own labels to each started Pod
113. Create a namespace for each team
114. Use affinity rules to schedule each team’s Pods to certain nodes
115. Use a virtualized container runtime such as Kata
116. Your development team is adding telemetry instrumentation to a new microservice that it’s working on. It is asking at which endpoint the Prometheus-compatible metrics should be exposed for collection. Which of the following is the correct choice?
117. /metrics
118. /metric
119. /prometheus
120. /collect
121. What are the four Cs of Cloud Native security?
122. Code, Commit, Comply, Cloud
123. Code, Container, Cluster, Cloud
124. Code, Commit, Cluster, Cloud
125. Code, Container, Commit, Collocation
126. You have been assigned to design a Kubernetes setup where all Pod-to-Pod traffic will be encrypted. Which of the following solutions would be suitable?
127. Use cluster network policies
128. Deploy a service mesh into the cluster
129. Use RBAC
130. Ask developers to add TLS to each application in the cluster
131. What is a component of a service mesh that must be part of all workloads in Kubernetes?
132. Service of type LoadBalancer in front of each Pod
133. Secret injected to all Pods
134. ConfigMap injected to all Pods
135. Sidecar container injected to all Pods
136. Which of the following are part of the Open Container Initiative (OCI) specifications? Select all that apply:
137. Image specification
138. Runtime specification
139. Distribution specification
140. Pod specification
141. Which of the following are the correct maturity levels for projects curated by CNCF?
142. Sandbox, Incubating, Passed
143. Sandbox, Incubating, Graduated
144. Sandboxed, Namespaced, Virtualized
145. Alpha, Beta, Release
146. You’ve been asked to deploy a tracing tool to analyze a complex microservice-based application. Which of the following could be an option?
147. Prometheus
148. Traefik
149. Knative
150. Jaeger
151. Which of the following are the attributes of highly resilient systems? Select all correct answers.
152. Traffic encryption
153. Latest kernel version
154. Desired state
155. Self-healing
156. Which technology is behind the default service discovery mechanism of Kubernetes?
157. Iptables
158. DNS
159. SSL
160. DHCP
161. You’ve been asked to implement automatic scaling (depending on the load) for an application running in Kubernetes. Which of the following tools will be helpful?
162. CA
163. Deployment Autoscaler (DA)
164. Horizontal Node Autoscaler (HNA)
165. HPA
166. A company is looking to hire a professional who understands the entire application lifecycle and makes security an essential part of it. Which of the following job roles should the company be looking for?
167. System Administrator
168. DevSecOps Engineer
169. Cloud Solution Architect
170. Data Scientist
171. Which of the following are valid container runtimes? Select all correct answers:
172. Xen
173. Kubernetes
174. gVisor (runsc)
175. containerd
176. Which ways exist to extend Kubernetes API with new features? Pick two:
177. Code resource definitions
178. Custom resource definitions
179. Extension layers
180. Aggregation layers
181. You have prepared a declarative Kubernetes spec file for a new application. The file is named microservice-d.yaml. How would you deploy it to the cluster using kubectl?
182. kubectl deploy -f microservice-d.yaml
183. kubectl apply -f microservice-d.yaml
184. kubectl run -f microservice-d.yaml
185. kubectl exec -f microservice-d.yaml
186. Your team is evaluating Kubernetes for container orchestration and would like to know which of the following features are available out of the box. Pick two:
187. Request tracing
188. IP Address Management (IPAM)
189. Service discovery
190. Full traffic encryption
191. Which of the following is considered a good CI/CD practice?
192. Frequent, large releases done by the whole team together
193. Frequent, small, and fully automated releases
194. Infrequent, large, and automated releases
195. Frequent, small, well-tested, and automated releases
196. What are the advantages of using Kubernetes controllers such as Deployment or StatefulSet compared to static definitions of simple Pods?
197. Controlled Pods start and run faster
198. They allow self-healing and rolling updates
199. They allow affinity settings to be defined
200. They allow Pods to be exposed via a Service
201. Which of the following is a valid statement about Serverless?
202. It is only available in the public cloud
203. It only works with Kubernetes
204. It does not use any server hardware
205. It abstracts away all server management operations
206. A team lead has asked you to help with development process optimization. Developers spend a lot of time testing and building packages themselves. What would be your suggestion?
207. Ask developers to install a newer IDE
208. Implement a CI/CD pipeline
209. Migrate applications to Kubernetes
210. Migrate applications to large bare-metal servers
211. An old application cannot be easily containerized and must continue to run in a VM but be managed with Kubernetes. Which of the following projects allows us to extend Kubernetes beyond container orchestration to also manage VMs?
212. KubeVirt
213. Kubeless
214. Swarm
215. Istio
216. Which of the following formats is commonly used for writing Kubernetes spec files?
217. CSV
218. YAML
219. HTML
220. XML
221. Which of the following elements are a part of GitOps? Pick two:
222. Kubernetes
223. Infrastructure as Code (IaC)
224. Jenkins
225. Merge (pull) requests
226. Which of the following are valid telemetry signals?
227. Logs, metrics, traces
228. Logs, pings, tracks
229. Logs, metadata, traces
230. Logs, measurements, traces
231. What does cluster-level logging mean in the Kubernetes environment?
232. When logs from each node in the cluster are stored on the control plane nodes at the /var/log path
233. When logs from all containers are shipped to a separate backend independent from the K8s lifecycle
234. When each Pod has its own logging configuration and individual log storage location
235. When all cluster events are logged into a separate log file
236. You’re troubleshooting an application that misbehaves and decide to enable maximum log verbosity to get as many details as possible. Which is the corresponding logging level?
237. CRITICAL
238. WARNING
239. INFO
240. DEBUG
241. You’ve been asked to configure autoscaling for a new application. Which class of telemetry signal is suitable?
242. Metrics
243. Application logs
244. Kubernetes events
245. Traces
246. Your organization has started a cost optimization initiative and is looking to reduce monthly cloud bills. Which of the following would you recommend?
247. Switch critical workloads to spot instances
248. Lower log level to save on storage
249. Implement autoscaling based on the load
250. Move from microservices to monoliths
251. What makes it possible to query Prometheus metrics from the past?
252. Alertmanager
253. Time Series Database (TSDB)
254. PVC
255. Graphite
256. Which of the following CNCF bodies is responsible for approving new CNCF projects and aligning existing ones?
257. Board of Directors
258. End User Community
259. Governing Board (GB)
260. Technical Oversight Committee (TOC)
261. Which of the following is the format of Prometheus metrics?
262. Traces
263. JSON
264. Time series
265. Spans
266. Which of the following should never be done in a team with an established GitOps process?
267. Opening (pull) merge requests
268. Manual changes in the live environment
269. Reviewing teammate’s code
270. Monitoring the system state
271. Your team is operating a Kubernetes cluster with a containerd runtime. Why might this be a concern for a new application with strict security requirements?
272. containerd is not the fastest runtime and can be a bottleneck
273. containerd does not support network policies
274. containerd relies on a shared kernel
275. containerd does not support Pod security policies
276. What are the advantages of containers when compared to VMs? Pick two:
277. Containers consume fewer resources than VMs
278. Containers are more secure than VMs
279. Containers take less time to start
280. Containers don’t need OS updates
281. How many times per year does a new Kubernetes release come out?
282. 1
283. 2
284. 3
285. 5
286. Which of the following allows us to use different container runtimes with Kubernetes?
287. CSI
288. CNI
289. SMI
290. CRI
291. It’s been said that Kubernetes has a declarative API. What does that mean?
292. We always need to declare a YAML spec file to use a K8s API
293. We declare the desired state and K8s will reach it once
294. We declare the desired state and K8s will constantly try to reach it
295. We instruct Kubernetes exactly what to do with which resource
296. Which of the following container runtimes adds an intermediate kernel layer between the host kernel and containers that become sandboxed?
297. containerd
298. gVisor
299. Kata
300. Dockerd

**Mock exam B**

Correct answers can be found in the Assessment section of the Appendix.

1. Which of the following are valid telemetry signals?
2. Measurements, traces, logs
3. Pings, traces, logs
4. Metadata, traces, logs
5. Metrics, traces, logs
6. Your organization is running Kubernetes, and the development team asked whether it would be possible to run Serverless applications with it. Which of the following projects can be used to implement your own Serverless platform on top of Kubernetes? Pick two:
7. Knative
8. OpenFaaS
9. KubeVirt
10. KubeConf
11. You’re planning a production deployment of a Kubernetes cluster in your organization. The control plane should be highly available. How many control plane nodes should be deployed?
12. 2
13. 4
14. 3
15. 1
16. Which of the following is the smallest, individually schedulable workload unit in Kubernetes?
17. Pod
18. Container
19. Deployment
20. Service
21. You have prepared a Kubernetes spec file for a new application. The file is named kcna-microservice.yaml. How would you deploy it to the cluster with kubectl?
22. kubectl deploy -f kcna-microservice.yaml
23. kubectl apply -f kcna-microservice.yaml
24. kubectl run -f kcna-microservice.yaml
25. kubectl exec -f kcna-microservice.yaml
26. Some applications in your organization cannot be easily containerized and must continue to run in a VM but be managed with Kubernetes. Which of the following projects allows us to extend Kubernetes to also manage VMs?
27. KubeVirt
28. Kubeless
29. Swarm
30. Knative
31. An application in Kubernetes runs under different loads depending on the time of the day. You’ve been asked to implement autoscaling for it to accommodate fluctuations. Which of the following tools can be helpful?
32. CA
33. HPA
34. HNA
35. DA
36. An application is misbehaving, and you’ve been asked to find the root cause. You decide to enable maximum log verbosity. Which of the following log levels provides the most details?
37. INFO
38. WARNING
39. ERROR
40. DEBUG
41. Which of the following are maturity levels for projects curated by the CNCF?
42. Sandbox, Incubating, Finished
43. Sandbox, Incubating, Graduated
44. Sandboxed, Namespaced, Graduated
45. Alpha, Beta, Release
46. Which of the following types of nodes does Kubernetes have?
47. Minion and worker nodes
48. Control plane and worker nodes
49. Control plane and minion nodes
50. Primary and secondary nodes
51. Which technology stands behind the default service discovery mechanism of Kubernetes?
52. Iptables
53. SSL
54. DNS
55. DHCP
56. You’ve been asked to deploy a tracing tool to analyze a distributed microservice-based application. Which of the following options can be considered? Pick two:
57. Zipkin
58. Traefik
59. Prometheus
60. Jaeger
61. You’re debugging an application in Kubernetes and need to check the logs from a container named kcna of the microservice Pod. How to do that with kubectl?
62. kubectl logs microservice
63. kubectl get logs microservice -c kcna
64. kubectl get logs microservice kcna
65. kubectl logs microservice -c kcna
66. Which of the following are part of the OCI specifications? Select all that apply:
67. Kubernetes specification
68. Runtime specification
69. Distribution specification
70. Image specification
71. Your team is evaluating Kubernetes for container orchestration and would like to know which network-related features are available by default. Pick two:
72. Request tracing
73. IPAM
74. Service discovery
75. Full traffic encryption
76. Which of the following Kubernetes resources allow us to recover (self-heal) an application if the node it was running on has failed? Pick two:
77. Deployment
78. Pod
79. StatefulSet
80. Service
81. You’ve been asked to deploy a new application in Kubernetes. Which check feature helps to constantly ensure that the application is running and healthy?
82. Deployment probe
83. Container runtime check
84. Reconciliation check
85. Liveness and readiness probes
86. With kubectl version 1.24 installed, which Kubernetes cluster versions would you be able to manage? Select all that apply:
87. 1.24
88. 1.25
89. 1.23
90. 1.21
91. Which crucial element of service mesh must be a part of all workloads in Kubernetes?
92. LoadBalancer service deployed in front of each Pod
93. Proxy config injected to all Pods
94. Service ConfigMap injected to all Pods
95. Sidecar container injected to all Pods
96. Which of the following Kubernetes components is used to store information about the cluster and its state?
97. etcd
98. kubelet
99. kube-store
100. PVC
101. Which of the following CNCF bodies is responsible for approving new CNCF projects and aligning existing ones?
102. TOC
103. End User Community
104. GB
105. Board of Directors
106. You’ve received security requirements for a new microservice-based application that should not run on hosts with shared kernels. Which of the following could be a solution?
107. Use Docker
108. Use namespaced container runtime
109. Use virtualized container runtime
110. Use Pod security policies
111. You’re operating a Kubernetes cluster in a cloud environment where worker nodes are spread across multiple AZs. You need to ensure that application Pods run across all AZs. Which K8s feature can be used?
112. StatefulSet
113. Pod topology spread constraints
114. Pod network policies
115. Pod availability policies
116. Which of the following kubectl commands can be used to get detailed information about a deployment called microservice-kcna?
117. kubectl get pod microservice-kcna
118. kubectl describe pod microservice-kcna
119. kubectl describe deployment microservice-kcna
120. kubectl explain deployment microservice-kcna
121. Which of the following is a valid container runtime? Select all correct answers:
122. KVM
123. Kubernetes
124. gVisor (runsc)
125. containerd
126. Which of the following best describes a highly resilient application and infrastructure?
127. Ability to automatically shut down in case of issues
128. Ability to automatically recover from most failures
129. Ability to preserve the state in case of failure
130. Ability to perform rolling updates
131. You are reviewing the release notes of a new Kubernetes version, and it turns out one of the resources you’re using has been deprecated. How much time would it take for a deprecated resource to be removed?
132. About 2 years
133. 4 months
134. 2 months
135. 6 months
136. Your development team is adding Prometheus-compatible telemetry instrumentation to a new microservice it’s working on. Which endpoint is scraped by Prometheus by default?
137. /metrics
138. /metric
139. /prometheus
140. /collect
141. You’re working on the deployment of an application that is missing native support for exposing Prometheus metrics. Which of the following allows us to collect metrics in such a case?
142. Running the application in Kubernetes
143. Installing Pushgateway
144. Installing Alertmanager
145. Installing Prometheus Exporter for the application
146. What are the four Cs of Cloud Native security?
147. Code, Commit, Compliance, Cloud
148. Code, Container, Cluster, Collocation
149. Code, Collaboration, Cluster, Cloud
150. Code, Container, Cluster, Cloud
151. Which of the following Kubernetes components is used to download container images and start containers?
152. kubelet
153. Container runtime
154. etcd
155. kube-scheduler
156. Which of the following is true about Serverless?
157. It is only available in the cloud
158. It only works with Kubernetes
159. It uses no server hardware at all
160. It abstracts all server management operations away
161. Which of the following is the smallest part of a Serverless application?
162. Gateway
163. Function
164. Commit
165. Container
166. You have just received credentials to access a Kubernetes cluster and would like to find out which namespaces are there. Which of the following kubectl commands can be used to list all namespaces in the cluster?
167. kubectl list namespaces --all-namespaces
168. kubectl show namespaces
169. kubectl get namespaces
170. kubectl list all namespaces
171. What happens when the Kubernetes scheduler cannot assign a Pod to a node?
172. It will be stuck in the Pending state
173. It will be forcefully run on one of the control plane nodes
174. It will be stuck in the NotScheduled state
175. It will be gone after five scheduling attempts
176. You’re working on a solution for a microservice-based application with strict security requirements. All network Pod-to-Pod communication has to be encrypted. Which of the following would be a suitable option?
177. Deploy a service mesh
178. Enforce K8s security policies
179. Set up Kubernetes RBAC
180. Use K8s network policies
181. Which of the following formats is normally used for application logs?
182. CSV
183. SSL
184. YAML
185. JSON
186. You’ve been asked to evaluate service mesh solutions. Which of the following projects can be used? Pick two:
187. Linkerd
188. Swarm
189. Istio
190. Traefik
191. You’re managing a Kubernetes cluster and need to run a logging agent on each node to ship the log to a centralized logging system for storage and processing. Which Kubernetes resource controller fits best?
192. DaemonSet
193. Deployment
194. StatefulSet
195. ReplicaSet
196. You’re debugging an application running in Kubernetes and you need to get the logs from a Pod called microservice-kcna that was just terminated. Which kubectl command allows you to do that?
197. kubectl get logs microservice-kcna -p
198. kubectl logs microservice-kcna -p
199. kubectl logs microservice-kcna
200. kubectl get logs microservice-kcna –previous
201. You’re reading the best practices guide and it recommends setting up cluster-level logging on Kubernetes. What exactly does that mean for log storage?
202. K8s needs separate log collection and aggregation systems
203. K8s aggregates all cluster logs on control plane nodes
204. K8s comes with a log storage and aggregation solution out of the box
205. K8s has storage only for the most important cluster health logs
206. Which Kubernetes spec setting configures the number of Pods managed by a Deployment?
207. podnum
208. Replicas
209. Containers
210. Instances
211. You’re evaluating different tools for building CI/CD pipelines to automate build-test-release processes for your development team. Which of the following can be considered? Pick two:
212. Prometheus
213. Jenkins
214. Linkerd
215. GitLab CI
216. A colleague has shared credentials to access a new Kubernetes cluster they just deployed. What do you need to do to access its API from your workstation?
217. Add new credentials to the kubecon file
218. Add new credentials to the kubernetes-conf file
219. Add new credentials to the kube-proxy file
220. Add new credentials to the kubeconfig file
221. You’re preparing to deploy a new application in a Kubernetes cluster, and you need to provide non-default configuration files for it. Which of the following K8s resources is suitable for storing and injecting generic configuration into containers?
222. SettingMap
223. ConfigMap
224. PV
225. Ingress
226. You’re evaluating options to deploy a microservice application into a Kubernetes cluster. The application must automatically recover from individual K8s node failures and should be updated via rolling updates. The application does not need to store data locally. Which K8s resource fits best for such a case?
227. StatelessSet
228. StatefulSet
229. ReplicaSet
230. Deployment
231. Your team runs Kubernetes in the public cloud, and due to fluctuating demand would like to dynamically add and remove cluster nodes depending on current demand. Which of the following would allow you to achieve that?
232. K8s Node autoscaler
233. K8s CA
234. K8s HPA
235. K8s VPA
236. Which of the following Kubernetes cluster configurations can be recommended for a highly available infrastructure setup?
237. 3 control planes and 10 worker nodes
238. 1 control plane and 10 worker nodes
239. 2 control planes and 10 worker nodes
240. 3 control planes and 1 worker node
241. Which of the following is true about containers and VMs? Pick two:
242. Applications are easy to package in containers
243. Applications are easy to package in VMs
244. Container images are easy to share
245. VM images are small in size
246. A development team has reached out, asking to help it improve its workflow and increase developer productivity. Which of the following can you recommend?
247. Deploy a service mesh
248. Switch to a different language such as Go or Python
249. Build a CI/CD pipeline
250. Migrate to a better cloud provider
251. Which of the following allows direct instrumentation for applications to provide metrics in Prometheus format?
252. K8s service discovery
253. Client libraries
254. Exporters
255. Pushgateway
256. Several departments have requested a partition with their own users and quotas on the corporate Kubernetes cluster. Which of the following can help?
257. Namespaced runtime
258. Shared runtime
259. Pod quota policy
260. Kubernetes namespaces
261. A development team is planning to deploy a new application soon, and you’re asked to configure autoscaling for it. Which class of telemetry is the best source for autoscaling decisions?
262. Metrics
263. Traces
264. Pings
265. Logs
266. A new colleague has recently started in your team, which follows a GitOps workflow. Which of the following should they not do as it goes against established GitOps processes?
267. Review any pull or merge requests
268. Make manual changes to environments
269. Deploy workloads to Kubernetes with declarative specifications
270. Respond to any alerts raised across production environments
271. Which of the following best describes horizontal scaling?
272. Adding more CPUs to the same service instance
273. Adding more RAM to the same service instance
274. Adding more replicas/instances of the same service
275. Adding an extra load balancer in front of the service instance
276. The development team has asked to automate the testing, build, and release of the applications it is working on, but the software should not be automatically deployed to any environments. Which of the following can help? Pick two:
277. GitOps
278. Flux CD
279. CI/CD pipelines
280. Jenkins
281. Which of the following characterizes Serverless computing? Pick two:
282. Servers are not needed anymore
283. It supports all programming languages
284. It is event-based
285. The provider takes care of server management
286. Why is using Kubernetes resource controllers such as Deployments a preferred way of deploying workloads in Kubernetes?
287. They make workloads run faster
288. They add self-healing, scaling, and rolling update features
289. They optimize CPU and RAM usage and consume fewer resources overall
290. They allow changing container images without restarting the Pods
291. What is the main operational mechanism behind Kubernetes resource controllers?
292. CI/CD
293. Serverless
294. Readiness probe
295. Reconciliation loops
296. The development team is working on incorporating telemetry into all applications written in different programming languages. They are asking whether there are any open source projects that can help. Which would you suggest?
297. Knative
298. Istio
299. OpenTelemetry
300. Traefik

**Assessments**

In the following pages, we will review all the practice questions from each of the chapters in this book and provide the correct answers.

**Chapter 1 – From Cloud to Cloud Native and Kubernetes**

1. B, D
2. C
3. B, D
4. D
5. B, D
6. B, C, D
7. A
8. C
9. A, B, D
10. A
11. A, B
12. C
13. B, C, D
14. A, B, D
15. C

**Chapter 2 – Overview of CNCF and Kubernetes Certifications**

1. A, C, D
2. D
3. B, C, D
4. C
5. A, B, D
6. A, B
7. A, B, C
8. D
9. A, B
10. C
11. C, D
12. B, C
13. A
14. A, B
15. B, C, D

**Chapter 3 – Getting Started with Containers**

1. A, C
2. A, C
3. D
4. A, D
5. C, D
6. A, C
7. B, D
8. A, C
9. B, D
10. A

**Chapter 4 – Exploring Container Runtimes, Interfaces, and Service Meshes**

1. D
2. B, C, D
3. B
4. D
5. D
6. B
7. C
8. C
9. B
10. D
11. A, B, C
12. B
13. A, D
14. B, C
15. A, C
16. A, C
17. B
18. D

**Chapter 5 – Orchestrating Containers with Kubernetes**

1. C
2. B, C, D
3. B, C
4. C, D
5. D
6. D
7. B
8. C
9. B, D
10. D
11. B, D
12. B, D
13. A, D
14. D
15. B
16. C
17. C
18. B
19. C
20. C
21. C, D

**Chapter 6 – Deploying and Scaling Applications with Kubernetes**

1. C, D
2. B, C
3. B
4. D
5. D
6. B
7. C
8. C
9. B
10. D
11. C
12. B
13. D
14. B, C
15. A
16. C
17. B
18. D

**Chapter 7 – Application Placement and Debugging with Kubernetes**

1. C, D
2. B
3. B
4. B
5. C
6. D
7. C
8. C
9. B
10. D
11. B
12. B, D
13. A
14. C
15. A
16. C

**Chapter 8 – Following Kubernetes Best Practices**

1. C
2. D
3. B
4. C
5. B
6. C
7. B
8. A
9. D
10. D
11. B, D
12. B
13. A
14. C, D
15. B

**Chapter 9 – Understanding Cloud Native Architectures**

1. C
2. B
3. A
4. D
5. B
6. D
7. C, D
8. C, D
9. A
10. D
11. B
12. D
13. A
14. A, C
15. A
16. D

**Chapter 10 – Implementing Telemetry and Observability in the Cloud**

1. C, D
2. B
3. D
4. B
5. D
6. B
7. C
8. C, D
9. B
10. D
11. A
12. D
13. A
14. C
15. D
16. A, C, D
17. D
18. C

**Chapter 11 – Automating Cloud Native Application Delivery**

1. C
2. A, B
3. B, D
4. C
5. A, B, D
6. B, C, D
7. C
8. D
9. C
10. B, D
11. A, C
12. C, D
13. A
14. C
15. C
16. A, C
17. A, C, D

**Chapter 12 – Practicing for the KCNA Exam**

**Mock exam A**

1. C
2. B
3. D
4. D
5. B
6. Deployment is the best option because ReplicaSet does not allow rolling updates and StatefulSet is not required for stateless applications.
7. C
8. D
9. A
10. D
11. B
12. D
13. A DaemonSet is the best option because it can ensure a replica is running on each Kubernetes node.
14. C
15. A, C
16. C
17. Containers in one pod can file system mounts and communicate over localhost. All containers of one pod will always run together on the same node.
18. D
19. B
20. CI/CD is the correct answer because we need build and test automation and we don’t need automatic deployments. CD is Continuous Delivery in this case.
21. A, C
22. D
23. B. Using namespaces is the best option as it allows to further restrict access by implementing RBAC policies. A team can be restricted to only one namespace.
24. A
25. B
26. B
27. D
28. A, B, C
29. B
30. D
31. C, D
32. B
33. HPA is the correct answer because we need to scale an application in the context of the question. Obviously, a cluster autoscaler would be required eventually to adjust the number of nodes.
34. B
35. C, D
36. B, D
37. B
38. B, C
39. D
40. B
41. D
42. B
43. A
44. B
45. B, D
46. A
47. B
48. D
49. A
50. C. Other options might either impact the stability or make it harder to operate the applications.
51. B
52. D
53. C
54. B
55. C
56. A, C
57. C. At the time of writing this book, it is approximately 3 releases per year.
58. D
59. C
60. B

**Mock exam B**

1. D
2. A, B
3. C
4. A
5. B
6. A
7. B
8. D
9. B
10. B
11. C
12. A, D
13. D
14. B, C, D
15. B, C
16. A, C
17. D
18. A, B, C. By default, kubectl should work with one version above and one version below.
19. D
20. A
21. A
22. C
23. B
24. C
25. C, D
26. B
27. A
28. A
29. D
30. D
31. B
32. D
33. B
34. C
35. A
36. A
37. D
38. A, C
39. A
40. B
41. A
42. B
43. B, D
44. D
45. B
46. Deployment is the best option because it satisfies all the requirements, and the application is stateless.
47. B
48. A
49. A, C
50. C
51. B
52. Kubernetes namespaces allow configuration of resource quotas.
53. A
54. B
55. C
56. C, D. GitOps would be helpful for continuous deployment and FluxCD is a GitOps tool, so both A and B are incorrect answers.
57. C, D
58. B
59. D
60. C