1. Choose one false statement about Pod resources:

- A: A Pod's contents run with shared namespaces.
- B: Pods can consist of one or more containers.
- C: A Pod's ports can be accessed externally directly
- D: A Pod's contents run with shared filesystem volumes

---

2. What result cannot be achieved with a Deployment?

- A: Creating a new Service
- B: Rolling back to an earlier revision
- C: Declaring the new state of the Pods
- D: Creating Pods by rolling out a ReplicaSet

3. Which of the following statements about Ingresses is false?

- A: Ingresses provide name-based virtual hosting.
- B: An Ingress exposes arbitrary ports or protocols.
- C: An Ingress can be used for proxy configuration.
- D: Ingresses can be configured to handle SSL termination.

---

4. Select one true statement about Services:

- A: Services support TCP, UDP and HTTP protocols.
- B: Services cannot be defined without a selector.
- C: Services create a ReplicaSet.
- D: Services cannot be exposed onto an external IP address that is outside a cluster.

5. Which Controller is not dependent on a Cloud-Controller Manager?

- A: Ingress Controller
- B: Route Controller
- C: Node Controller
- D: Service Controller

---

6. Which of Kubernetes' resources cannot define containers' CPU/memory limitations?

- A: Namespace
- B: Ingress
- C: Deployment
- D: Pod

7. Which of the following kubectl command for editing an existing resource's configuration is incorrect?

- A: kubectl edit RESOURCE_TYPE RESOURCE_ID -o yaml --save-config
- B: kubectl create -f ./configuration.yaml
- C: cat configuration.json | kubectl apply -f -
- D: kubectl create RESOURCE_TYPE RESOURCE_NAME --dry-run=true -o yaml | kubectl apply -f -

---

8. Which of the following kubectl delete commands is incorrect?

- A: kubectl delete node NODE_ID --force
- B: kubectl delete -n DEPLOYMENT_NAMESPACE deployment DEPLOYMENT_ID
- C: kubectl delete pod POD_ID --grace-period=0 --force
- D: kubectl delete service -l name=service-label

---

9. Pick one k8s resource which is not associated with any namespace:

- ○ A: ReplicaSets
- ○ B: PersistentVolumes
- ○ C: DaemonSets
- ○ D: Services

---

10. What is the link between Scaling and Deployments?

- ○ A: Scaling creates a new Service.
- ◉ B: Scaling deletes Deployments and creates ReplicaSets.
- ○ C: Scaling exposes a Deployment to external network traffic.
- ○ D: Scaling changes the number of Replicas in a Deployment.

Task 2

1. Which echo command during Pipeline execution will **not** display environment variable on console log?

- ○ A:

```
pipeline {
  agent any
  environment {
    FOO = 'BAR'
  }
  stages {
    stage('test') {
      steps {
        echo env.FOO
      }
    }
  }
}
```

B:

```
pipeline {
  agent any
  stages {
    stage('test') {
      steps {
        script {
          env.FOO = 'BAR'
        }
        echo env.FOO
      }
    }
  }
}
```

C:

```
pipeline {
  agent any
  stages {
    stage('test') {
      steps {
        sh 'export FOO=bar'
        echo env.FOO
      }
    }
  }
```

```
}
```

D:

```
pipeline {
  agent any
  stages {
    stage('test') {
      steps {
        script {
          withEnv(["FOO=BAR"]) {
            echo env.FOO
          }
        }
      }
    }
  }
}
```

2. What is an Artifact in Jenkins?

- A: An immutable file generated during Build which is archived onto the Node on which the archiving command was executed.
- B: A mutable file generated during Build which is archived onto the last used Node.
- C: An immutable file generated during Build which is archived onto the Jenkins Master.
- D: A mutable file generated during a Build which is archived onto the Node on which the archiving command was executed.

---

3. Select one incorrect approach to connect Master with a Node.

- A: Using JNLP protocol over TCP from jenkins.jar file.
- B: Using username password via SSH connection.
- C: Using SSH connection with key authentication.
- D: Setting up a UDP socket from jenkins.jar file

---

4. What happens when you send POST HTTP request to "${JENKINS_URL}/safeRestart"?

- A: Jenkins dumps its heap to the file and restarts, later on the heapdump is loaded into memory again.
- B: Jenkins waits until all the builds get completed before restarting.
- C: Jenkins safely restarts Nodes included in the request.
- D: Jenkins restores default settings of Groovy sandbox used in jobs execution.

---

5. Which sentence does not describe Jenkins Cloud?

- A: It creates dynamic agents based on labels with a specified retention time.
- B: It is an abstraction layer which could be implemented by various cloud providers with their own plugins
- C: It is used to realise multi-master architecture deployment.
- D: It could be used to create any type of agent including VMs and containers

6. Select one incorrect job schedule syntax:

- A: H(0,30) 02 01 * *
- B: H(0,30) D(0,20) 02 01 * *
- C: 00 0,12 * * 0-4
- D: */5 * * * *

---

7. Indicate one incorrect sentence about difference between usage of `parallel` in Scripted and Declarative Pipelines

- A: Scripted Pipeline's parallel uses named arguments as parameters, while Declarative is configured with closures.
- B: For Scripted Pipeline parallel stages could be generated dynamically, while in Declarative they have to be defined statically
- C: `failFast` option in Declarative Pipeline has to be set in `options` block, while in Scripted it has to be defined as a named argument of the function.
- D: Both in Scripted and Declarative Pipelines parallel execution can be nested in other parallel execution of the same type

8. Select correct sequence of numbers displayed in the console output after the very FIRST build defined in this Jenkinsfile.

```
pipeline {
  agent any
  stages {
    stage("Hello") {
      steps {
        error("Blocking pipeline")
      }
      post {
        always {
          echo "1"
        }
        changed {
          echo "2"
        }
        failure {
          echo "3"
        }
        unsuccessful {
          echo "4"
        }
        unstable {
          echo "5"
        }
                cleanup {
                  echo "6"
                }
              }
            }
          }
          post {
            always {
              echo "8"
            }
          }
        }
```

- A: 1, 2, 5, 3, 8
- B: 1, 2, 4, 3, 6
- C: 1, 4, 3, 6, 8
- D: 1, 2, 4, 3, 6, 8

9. Which configuration block can not be used in Declarative Pipeline?

A:

```
options {
  timeout(time: 5, unit: 'MINUTES')
}
```

B:

```
triggers {
  cron '@daily'
}
```

C:

```
scm {
  git(credentialsId: 'git-credentials')
}
```

D:

```
parameters {
  booleanParam(defaultValue: true, description: '', name: 'flag')
}
```

10. Select one block from Declarative Pipeline which is logically different from the others or is syntactically incorrect.

A:

```
when {
  allOf {
    anyOf {
        expression {
          env.JOB_NAME =~ /.*prod.*/
        }
        expression {
          env.JOB_NAME =~ /.*qa.*/
        }
    }
    buildingTag()
  }
}
```

B:

```
when {
  anyOf {
    equals expected: 'qa', actual: env.JOB_NAME
    equals expected: 'prod', actual: env.JOB_NAME
  }
  buildingTag()
}
```

C:

```
when {
  allOf {
    anyOf {
      environment ignoreCase: true, name: 'job_name', value: 'qa'
      environment ignoreCase: true, name: 'job_name', value: 'prod'
    }
    buildingTag()
  }
}
```

D:

```
when {
  allOf {
    anyOf {
      expression {
          env.JOB_NAME == "prod"
      }
      expression {
          env.JOB_NAME == "qa"
      }
    }
    buildingTag()
  }
}
```

Task 3 Multiple Choice Question

1. Docker cache layer size **cannot** be reduced...

   - A: ...by adding

     `--no-cache`

     flag or equivalents to package managers.
   - B: ...by removing transitive dependencies within the same layer.
   - C: ...by removing unused packages from the base image.
   - D: ...by using multistage builds to copy artifacts from previous images.

2. Choose one **incorrect** way of defining environment variables while using docker-compose:

   - A: Env block with

     `KEY=VALUE`

     for a service substituted via .env file located in the same directory as the docker-compose file.
   - B: Env block with

     `KEY=VALUE`

     for a service substituted via .env file located in the current working directory.
   - C: Setting environment variables in the variables block for a service defined within the docker-compose file itself.
   - D: When

     `EXPOSE`

     command is defined, ports can be accessible for the host.
     Env block with

     `KEY=VALUE`

     for the service substituted via environment variables from the running machine.

3. Select one **false** statement about cache in Docker.

   - A: Docker cache uses SHA256 hash for identification.
   - B: Cache layers are defined on the registry level.
   - C: It's impossible to cache web content during a Docker build.
   - D: Result of

     `ADD`

     command is cached only in specific cases.

---

4. What is the difference between CMD and ENTRYPOINT commands?

- A:

  When both commands are defined in one Dockerfile

  `CMD`

  command will override

  `ENTRYPOINT`

- B:

  `ENTRYPOINT`

  should be defined when using the container as an executable.

- C:

  `ENTRYPOINT`

  should be used as a way of defining default arguments for a

  `CMD`

  command or for executing an ad-hoc command inside container.

- D:

  `ENTRYPOINT`

  defined in Dockerfile can be overridden via Docker run command, contrary to

  `CMD`

  command.

---

5. How to establish a TCP connection between multiple containers?

- A: By creating a Docker network using a driver and attaching containers to it.
- B: Containers are using global network by default.
- C: Containers have to be started in a single Docker command.
- D: By using network name with a

  `PUBLISH`

  command in Dockerfile.

6. What is the difference between a Docker container and a Virtual Machine?

- A: Each VM has its own virtual OS, but a Docker container uses the host OS.
- B: VMs can use the same kernel space, Docker containers need separation.
- C: VM does not need a hypervisor, but Docker does.
- D: Containers use separation on the hardware level and VMs on the logic level.

7. How to connect a Docker network with a host?

- A: By creating a Docker network with localhost driver and attaching a container to it.
- B:
  By using a special network "host" while
  `docker run`
- C: By executing
  `docker run`
  with superuser privileges.
- D: By using a global network driver.

8. How to access container logs in container's runtime?

- A:
  `/var/log/Docker/container/<container_id>`
- B:
  `docker logs <container_id>`
- C:
  `docker ps --logs <container_id>`
- D:
  `docker inspect --logs <container_id>`

9. Pick one **wrong** approach when setting up load balancing strategies in Docker-based systems.

- A: Exposing a Docker socket via TCP protocol for connecting machines into same network
- B: Exposing a Docker socket via UDP protocol for connecting machines into same network
- C: Using internal Docker network in already connected machines
- D: Using ingress controller from an external orchestrator (e.g. Traefik, Nginx, HAProxy) in already connected machines

---

10. How to map file system permissions between a host and a container?

- A: By extending initial process inside

  `ENTRYPOINT`

  with a chown command
- B: The host's user needs to have the same GUID and UID as the file owner inside the container
- C: It's only possible with superuser permissions
- D: The Docker engine supports it out of the box

Task 4

1. Which of the operations would you use to remove files that are created during compilation of a project?

- A: git clean
- B: git gc
- C: git reset --hard

---

2. You have accidentally amended instead of making a separate commit. What command would you use to recover the commit SHA before the amend?

- A: git am --keep
- B: git am --reject
- C: git pull --rebase
- D: git rebase
- E: git reflog

3. SHA of a commit will not change if you change only:

- A: commit author
- B: commit date
- C: commit message
- D: commit parents
- E: none of the above

---

4. You have accidentally committed and pushed data that should not be public (e.g. keys). What operation would you use to remove it from the remote?

- A: git push -f
- B: git remote remove
- C: git revert

5. How would you check who is the last person that modified a line in a file?

- A: git blame
- B: git fetch
- C: git log

---

6. Does a fast forward merge create a commit?

- A: Always
- B: Sometimes
- C: Never

7. Is it possible to have two starting commits (i.e. two commits without parents)?

- A: Yes
- B: No

---

8. It is possible to refer to a commit by using a SHA (e.g. d57afc112). Can two different SHAs refer to the same commit?

- A: Yes
- B: No

---

9. It is possible to refer to a commit by using name of a branch (e.g. master). Can two different branches refer to the same commit?

- A: Yes
- B: No

10. It is possible to refer to a commit by using name of a tag (e.g. v2.0). Can two different tags refer to the same commit?

- A: Yes
- B: No