Introduction to DevOps (96112)
Mid-Term Exam - Spring 2024
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Instructions

- This Exam consists of **two** parts. An Objective section is followed by a subjective part.
- Return the objective part after completion.
- Write your name and ERP number in ALL CAPS in the provided space.
- Please clearly circle the correct choice. Do not overwrite.
- Unless otherwise written, all choices have one correct answer.
- Total Marks: 20, Total time: 2 hours. Manage the time yourself between two sections.

NAME		**ERP ID**	

SECTION 1 of 2 (10 marks) - Attempt any 10

1. **Which statement best describes the goal of DevOps**
   a. DevOps aims to give developers complete control over application releases, creating a siloed environment.
   b. DevOps strives to enable faster and more frequent releases of reliable applications. This is achieved through automation, collaboration, and streamlined processes.
   c. DevOps promotes a model where developers handle all operational tasks, eliminating the need for a separate operations team.

2. **Release Velocity is defined by**
   a. A measure of the speed and efficiency of software delivery.
   b. The time it takes to fix bugs in production.
   c. The number of features included in a release.
   d. The cost of developing and deploying software.

3. **When a docker container stops, all persistent data is lost.**
   a. True
   b. False

4. **What is the primary function of Services in Kubernetes?**
   a. To define the desired state of containerized applications and manage their lifecycle.
   b. To provide a stable and discoverable endpoint for accessing pods within a cluster.
   c. To define what container to run in a Pod.

5. **What is the purpose of the `docker-compose.yml` file?**
   a. To define the build process for a Docker image.
   b. To document the dependencies and libraries required by an application.
   c. To configure a multi-container application using Docker Compose.

6. **What are some potential benefits of using the sidecar pattern in Docker?**
    a. Increased isolation and separation of concerns between application logic and supporting functionalities.
    b. Reduced code complexity within the main application container.
    c. Simplified deployment and management of complex applications.
    d. All of the above

7. **What are some common tools used to implement GitOps?**
    a. Argo CD, Flux, and K8 Kustomize
    b. Docker Compose, Kubernetes, Helm Charts
    c. GitHub Actions & Terraform

8. **What is the core principle behind GitOps?**
    a. Managing infrastructure and applications through configuration files stored in a Git repository.
    b. Use Git as the source of truth for the current state of infrastructure. Any manual change to infrastructure should auto-revert.
    c. All of the above.

9. **How does GitOps ensure the desired state of the infrastructure is reflected in the actual running environment?**
    a. Automated reconciliation continuously compares the current state with the desired state in Git and makes necessary adjustments.
    b. Git Hooks are triggered on changes in the Git repository to deploy and configure the infrastructure.

10. **What is the primary benefit of using IaC compared to manually configuring infrastructure?**
    a. Improved scalability for handling large and complex deployments.
    b. Reduced cost of infrastructure management due to automation.
    c. All of the above.

11. **What is the purpose of Namespaces in Kubernetes? Select All that apply.**
    a. To isolate resources like pods, services, and deployments for different teams or projects within a single cluster.
    b. To define resource quotas and limit the usage of cluster resources by different users.
    c. To group pods based on their functionality or application roles.

12. **How can you expose a service running in a Kubernetes cluster to the outside world?**
    a. By directly accessing individual pods hosting the application.
    b. Utilizing NodePort Services, which map ports on individual nodes to the service port.
    c. Implementing LoadBalancer Services, which balance traffic across pods and provide a single external endpoint.