1. DevOps is a set of practices and cultural philosophies that aim to bridge the gap between software development (Dev) and IT Operations (Ops) teams. The main goal is to improve collaboration, automate processes, and enhance software delivery speed and quality. Here are some of the most popular DevOps tools categorized by different stages of the DevOps lifecycle :

- Git
- Docker
- Kubernetes
- Ansible
- Terraform
- Sonarqube and many more

2. Here are the key phases of the DevOps lifecycle :
    - Plan
    - Code
    - Build
    - Test
    - Release
    - Deploy
    - Operate
    - Monitor
    - Feedback

3. Continuous Integration(CI): Continuous Integration is merging code changes from multiple developers into a shared repository. Continuous Delivery is an extension of Continuous Integration that automates the release process, ensuring that code is always in a deployable state.

4. Git is a distributed version control system that lets you track changes in your code, collaborate with other developers, and manage versions of your files. GitHub is a cloud-based hosting platform for Git repositories.

5. A. git branch <name>
   B. git checkout <branch_name>
   C. git commit -m “Commit Message”
   D. git status
   E. git fetch origin
   F. git remote -v
   G. git merge <source-branch>
   H. git push origin <branch-name>
   I. git rm <file-name> , git mv <old-file-name><new-file-name>
   J. git logs

6. Virtualization is a technology that allows you to create multiple simulated environments or virtual machines

from a single physical hardware system. Different types of virtualization are :

- HardwareVirtualization
- Operating System Virtualization
- Network Virtualization
- Storage Virtualization

7. Docker is a containerized platform for storing applications and their dependencies together in a container. It streamlines application development, deployment, and management.
8. Docker volume is used to persist data generated and used by the Docker container. Yes, you can create and mount multiple volumes in a single docker container.
9. It provides a way for a container to communicate with each other with the outside world. To create a network we use “docker network create” command.
10. Ansible is an open-source automation tool used for configuration management, application, deployment, and task automation. Ansible works using inventory, playbook, modules, tasks, handlers, and configuration. To set an Ansible you require an operating system, python, and SSH access.
11. Terraform is an open-source tool developed by HashiCrop for Infrastructure as Code (IaC). It is used in DevOps for several reasons like Infrastructure as

code, Automation and Efficiency, Infrastructure planning modularity, and reuseability.

12. A jenkinsfile is a text file that contains the definition of jenkins pipeline. Jenkins master is the central server that manages the jenkins instance , It handles pipeline management , user interface, job schedule and execution control. Jenkins slave are the machines that executes the build jobs sent by the master , It executes Jobs, Parallel Execution and Isolation.
13. Declarative pipeline are more structured and human-readable way to define your Jenkins.The scripted pipeline is a groovy-based specific language (DSL) that allows users to define pipelines using imperative scripting syntax.
14. Sonarqube is used for continuous inspection of code quality. Languages supported by sonarqube are java, C#, Python, PHP, SQL, Ruby, and many more .
15. A. docker built-t <image_name>
    B. docker run
    C. docker stop , docker restart <container_name>
    D. docker rmi <image_name or id >
    E. docker network create <network_name>
    F.
    G. docker volume create <volume_name>
    H. docker volume inspect <volume_name>

16. The benefits of docker are: Consistency across environment, Isolation, Portability, scalability, and Fast Deployment.
17. Declarative Configuration, Simplified Deployment, Service Management, Development Workflow, CleanUp and Maintenance.
18. SSH provides a secure way to access and manage remote systems over an unsecured network. TCP is used for establishing and maintaining connections between network computers and ensuring the reliable transmission of data.
19. Servers are the hardware machine dedicated to running serve applications and servers. Virtual server is the software based representation of the physical server.
20. SDLC is a structured approach to software development that outlines the stages involved in creating software applications . Agile methodology is interactive ans incremental approach to software development emphazies flexibility, collaborationand customer feedback.
21. Docker images are read-only template use to create container. Containers are lightweight, standalone, executable package that include everything.

22. Docker network connect <network_name><container_name or id>
23. Docker run -d name container1 –network my_network my image1.
24. YAML is a human readable data serialization format that is often used for configuration files and data exchange between languages with the different data structure . We should use YALM because it is readability, simplicity, flexibility
25. Linux is a open-source that is widely used in the world. It serves as the core component of many operating systems, collaboratively know as linux distribution. It is used because of cost, security, performance and flexibility