1. Docker & Kubernetes

Docker:

a. Docker Overview
b. Understanding Docker
c. Difference between Physical Servers, Virtual Machines and Docker
d. Docker Installation
e. Docker CLI Overview
f. Docker and container

Building Container Images
a. Docker file
b. Docker file instructions
c. Multi stage Docker build

Storing and Distributing Images
a. Docker Hub
b. Docker Store
c. Docker Registry
d. Docker Trusted Registry
e. Azure Container Registry
f. Amazon ECR

Managing Containers
a. Docker container Commands
b. Docker Network and Volumes

Docker Networking, Docker Volumes (Storage), Docker Compose (Installation & Docker Compose Yaml, Docker Compose Commands, Docker App)

Windows Containers
a. Introduction to Windows Containers
b. Setting up Docker host for Windows Containers
c. Running Windows Containers
d. Windows Docker file
e. Windows containers & Docker compose

Docker Swarm and Services, Docker Security, Docker Workflows, Docker Enterprise Edition

Kubernetes:

Overview
· Introduction to Microservices
· Clustering and Orchestration
· Kubernetes Architecture

· Kubernetes Core Concepts
o Pods
o Namespaces
o API primitives

Kubernetes runtime
· Health checks
· Application Scheduling
· Kubernetes Networking
· Service Discovery
· DNS
· Multitenancy
· Kubernetes Namespaces
· Kubernetes Storage Overview
· Persistent Storage & Stateful sets
· Monitoring, Logging & Troubleshooting
· Creating Kubernetes Clusters
· Cluster Authentication, Authorization & Container Security

Native Kubernetes on Amazon Cloud using Elastic Kubernetes Services (EKS)

2. Microsoft Azure

Azure Active Directory: Overview, what is Azure Active Directory, Group and Access Management Group-based licensing, Azure AD architecture, Default User Permissions, Organization, Groups, Users, Authentication (Multifactor & Self-Service Password Reset), Azure RBAC, Custom Roles in Azure, Privileged Identity Management.

Azure Virtual Machines: How Azure VM's Work internally, VM Types & Sizes, Virtualization technologies in azure, Creation & Management of VM's, Creating VM Images, High Available VM's, Availability Sets & Availability Zones, VM Scale Sets, VM Scale Sets with Load balancers & application gateways, Dedicated hosts, Maintenance & Updates, VM Extensions, Cloud-Init

Operations: Azure Batch, Azure Monitor, Azure Site Recovery, Azure Backup Service, Azure Policies.

Azure Storage: Azure Storage Accounts Overview, Storage account types, Blob Storage, Page Blobs, Block Blobs, Table Storage, Queue Storage, File Storage, Data Redundancy, Access Tiers, Performance & Scaling, Concurrency, Static Websites using Storage Accounts, Event Handling, Page Blobs, Transferring Data using AzCopy.

Azure Managed Disks, Azure StorSimple and Data Box

Azure SQL, Azure MySQL, Azure Redis Cache, Azure Cosmos DB.

ARM Templates: Overview, JSON, Resources, Parameters, Variables, Functions, Resources, Outputs, Template File Structure, Template reference, Template Functions, Azure Migrate.

Networking: Networking Basics, Virtual Network, Subnets, Network Security Groups, Application Security Groups, Routing, Service Endpoints, Service Endpoint Polices, VNET Peering, Virtual Network TAP, Virtual Networking for Azure Services, Container & Kubernetes networking, VNET Replication for Business Continuity, IP Addressing, Public IP prefix, IpV6 for Azure VNet, Cross network Connectivity, Backend Connectivity Interoperability

Azure DNS: Public DNS (Zones & Records, Alias Records, Reverse DNS and Disaster Recovery)

Azure Load balancers & Application Gateway: Azure Load Balancer Overview, Basic Load Balancer, Standard Load Balancer, Health probes, High Availability ports, Multiple frontends, Outbound Connections, Outbound Rules, Load Balancer Metrics, Azure Application Gateway Overview, Application Gateway Components, Routing, SSL.

3. Continuous Integration (Ansible)

System Architecture and Design of Ansible:

a. Installation and Configuration
b. Core Concepts of Ansible
i. Inventory
ii. Module
iii. Adhoc Command
iv. Playbooks
v. YAML
c. Inventory and Playbook Parsing
d. Module transport and Execution
e. Variable Types
f. Variable Precedence
g. External data access

Ansible Essentials:

a. Static Inventories
b. Dynamic Inventories
c. Common Modules
d. Playbook syntax
e. Conditionals
f. Error Handling
g. Variables and Facts
h. Templates
i. Roles and Ansible Galaxy
j. Parallelism

Protecting Secrets with Ansible (Encrypting data at rest & Mixing Encrypting with plain YAML), Controlling Task Conditions (Failure, change, Error recovery & Iterative tasks with loops), Reusable Ansible Content with Roles (Task, handler, variable and playbook inclusion concepts & Roles), Troubleshooting Ansible (Playbook logging and verbosity, Variable introspection & Debugging code execution)

4. Terraform

Packer: What is Packer, Why Use Packer, Installing Packer, Packer Constructs (Artifacts, Builds, Builders, Commands, Post-Processor, Provisioners, Templates), Packer CLI

Terraform:
Infrastructure Provisioning
a. What is Infrastructure as Code
b. Infrastructure as Code in the Cloud
c. How Terraform Does Infra Provisioning

Installation

Terraform Constructs
a. Terraform DSL
b. Providers
c. Resource
d. Arguments
e. Attributes
f. Variables
g. Maps and Lookups
h. Modules
i. Local State
j. Remote State
k. Taint and Update Resources

Terraform DSL
a. Declaring Variables
b. Working with Resources
c. Nested Blocks
d. Dynamic Nested Blocks
e. Expressions and functions

Resources and Providers
a. Null Resource
b. Local Exec
c. AWS Provider and Resources
d. Azure Provider and Resources
e. Docker Provider and Resources
f. Kubernetes Provider and Resources

Terraform Registry, Terraform Remote State and Workspace, Terraform Trouble Shooting

Using Terraform to create a AWS/Azure Cloud Deployment