**Module – 5**

**Cloud computing**

1-How to configure, develop and maintain Security and Privacy in cloud?

🡪**Shortest Answers:**

1. **IAM** – Use RBAC, MFA, strong policies
2. **Encryption** – Data at rest & in transit
3. **Network Security** – Firewalls, VPN, security groups
4. **Updates** – Patch OS/apps regularly
5. **Monitoring** – Use logs, alerts (e.g., CloudWatch)
6. **Backup/DR** – Regular backups, test recovery
7. **Compliance** – Follow standards, run audits

2-What is Portability in cloud?

🡪**Portability in Cloud:**  
Ability to **move apps and data** between cloud environments **without major changes**.

3-What is Reliability and high Availability in cloud?

🡪**Reliability:**  
Ensures **consistent performance** and **no data loss** over time.

**High Availability (HA):**  
Keeps services **running with minimal downtime**, even during failures.

4-Describe Mobility Cloud Computing

🡪**Mobility in Cloud Computing:**  
Accessing cloud services **anytime, anywhere** using **mobile devices** via the internet. Enables **real-time data access** and **collaboration**.

5-Describe AWS, Azure, Google cloud Platforms

🡪**1. AWS (Amazon Web Services):**  
Largest cloud provider, offers wide range of services (EC2, S3, Lambda).

**2. Microsoft Azure:**  
Integrated with Microsoft tools, strong in hybrid cloud and enterprise solutions.

**3. Google Cloud Platform (GCP):**  
Known for AI, machine learning, and data analytics (BigQuery, Vertex AI).

6-Accessing AWS, Azure and Google cloud Platforms (any one portal )

🡪**Accessing AWS Portal:**  
Go to [https://console.aws.amazon.com](https://console.aws.amazon.com/)

* Sign in with AWS account
* Use **GUI**, **CLI**, or **SDKs** to manage services

7-Create compute, create network, create storage on AWS , Azure and GCP

🡪**Creating Resources on AWS, Azure, and GCP (Short Steps):**

**AWS**

1. **Compute (EC2):**
   * Go to **EC2** > Launch Instance > Choose OS > Configure > Launch
2. **Network (VPC):**
   * Go to **VPC** > Create VPC > Set CIDR block > Create
3. **Storage (S3):**
   * Go to **S3** > Create Bucket > Name > Set permissions > Create

**Azure**

1. **Compute (VM):**
   * Go to **Virtual Machines** > Create > Select Image > Configure > Review & Create
2. **Network (VNet):**
   * Go to **Virtual Network** > Create > Set IP range > Create
3. **Storage (Blob):**
   * Go to **Storage Accounts** > Create > Select region > Create
   * Inside account > Blob service > Create Container

**GCP**

1. **Compute (VM):**
   * Go to **Compute Engine** > VM Instances > Create > Choose OS > Create
2. **Network (VPC):**
   * Go to **VPC network** > Create VPC > Define subnet > Create
3. **Storage (Bucket):**
   * Go to **Cloud Storage** > Create Bucket > Set name & location > Create

8-Compare Cloud pricing of resources and services on all platform Amazon Web Services (AWS):

🡪**Cloud Pricing Comparison in INR (Approximate, ₹1 USD ≈ ₹83):**

**1. Compute (4 vCPU, 16GB RAM – per hour)**

* **AWS:** ₹11/hr
* **Azure:** ₹13/hr
* **GCP:** ₹12.5/hr

**2. Storage (per GB/month)**

* **AWS S3:** ₹1.91
* **Azure Blob:** ₹1.74
* **GCP Storage:** ₹1.91

**3. Data Transfer (per GB)**

* **AWS:** ₹7.50
* **Azure:** ₹7.22
* **GCP:** First 1 TB free, then ₹10/GB

**4. Discounts (1-year reserved/committed use)**

* **AWS:** Up to ~41% off
* **Azure:** Up to ~32% off
* **GCP:** Up to ~37% off