Basic Cloud Computing Questions:

1. What is cloud computing in simple terms? Cloud computing is the delivery of IT resources such as servers, storage, databases, networking, and software over the internet. It offers flexibility, scalability, faster innovation, and cost savings.

2. What are the main types of cloud services?

- Infrastructure as a Service (IaaS)
- Platform as a Service (PaaS)
- Software as a Service (SaaS)

3. Difference between IaaS, PaaS, and SaaS:

- **IaaS:** Provides virtual servers, storage, and networking (e.g., AWS EC2).
- **PaaS:** Provides a platform to develop, run, and manage applications (e.g., AWS Elastic Beanstalk).
- **SaaS:** Provides software applications over the internet (e.g., Gmail, Dropbox).

4. Advantages of cloud computing:

- Cost efficiency
- Speed and performance
- Scalability and flexibility
- Security
- Disaster recovery
- Automatic updates

5. Public, Private, and Hybrid Clouds:

- **Public Cloud:** Services delivered over the internet (e.g., AWS, Azure).
- **Private Cloud:** Cloud infrastructure operated exclusively for a single organization.
- **Hybrid Cloud:** Combines public and private cloud elements.

AWS-Specific Questions:

6. What is AWS and why is it popular? AWS (Amazon Web Services) is a comprehensive cloud platform offering infrastructure, storage, database, and application services. It is popular due to reliability, scalability, broad service offerings, and pay-as-you-go pricing.

7. Important services provided by AWS:

- EC2 (Elastic Compute Cloud)
- S3 (Simple Storage Service)
- RDS (Relational Database Service)
- Lambda
- VPC (Virtual Private Cloud)
- CloudFront

8. What is EC2? Amazon EC2 provides scalable virtual servers in the cloud.

9. What is S3 and its use cases? Amazon S3 is an object storage service used for backup and restore, archiving, big data analytics, and static website hosting.

10. How does AWS Lambda work? AWS Lambda lets you run code without provisioning servers. You only pay for the compute time you consume.

11. What is AWS VPC and why is it needed? A VPC is a logically isolated network in AWS, allowing you to launch AWS resources with control over networking.

12. How do security groups work in AWS? Security groups act as virtual firewalls controlling inbound and outbound traffic to resources.

13. Difference between ELB and Auto Scaling:

- **ELB:** Distributes incoming traffic across multiple targets.
- **Auto Scaling:** Automatically adjusts the number of resources based on demand.

14. What is IAM in AWS? IAM (Identity and Access Management) is a service that allows you to manage secure access to AWS services and resources.

15. What is an AWS Availability Zone? An Availability Zone is a distinct data center within a region, providing high availability by isolating failures.

Additional AWS Services:

16. What is AWS RDS and its benefits? Amazon RDS is a managed relational database service offering easy setup, operation, scalability, backups, and high availability.

17. What is Amazon DynamoDB? DynamoDB is a fully managed NoSQL database service that delivers fast performance at scale.

18. What is Amazon CloudWatch? CloudWatch is a monitoring and observability service that provides data and actionable insights for AWS resources.

19. What is AWS Elastic Beanstalk? Elastic Beanstalk is a service for deploying and managing web applications without managing the underlying infrastructure.

20. What is AWS Route 53? Route 53 is a scalable Domain Name System (DNS) service.

Practical Understanding:

21. How to host a website on AWS:

- Store static files in S3.

- Use EC2 for dynamic content.
- Use Route 53 for domain registration.
- Use CloudFront for content delivery.

22. Difference between Amazon RDS and DynamoDB:

- **RDS:** Relational database service for structured SQL data.
- **DynamoDB:** NoSQL database service for key-value and document data.

23. How to secure data on AWS:

- Use IAM roles and policies.
- Encrypt data at rest and in transit.
- Enable MFA (Multi-Factor Authentication).
- Use AWS CloudTrail and AWS Config for monitoring.

24. What is AWS CloudFront? CloudFront is a CDN service that speeds up distribution of content to users globally.

25. How to monitor AWS resources? Using Amazon CloudWatch to collect and monitor logs, metrics, and set alarms.

Conceptual/Advanced Questions:

26. What is the shared responsibility model in AWS? AWS manages the security "of" the cloud, while customers manage the security "in" the cloud.

27. Explain elasticity and scalability:

- **Elasticity:** Auto-scaling resources up/down based on demand.
- **Scalability:** Adding resources to meet growing demands.

28. What are Spot Instances? Spot Instances are unused EC2 instances offered at reduced prices. They are ideal for flexible, fault-tolerant workloads.

29. How does AWS ensure high availability? By deploying resources across multiple Availability Zones and Regions.

30. What is Multi-AZ deployment in AWS? Multi-AZ deployment means replicating resources across multiple Availability Zones for fault tolerance and disaster recovery.

Practical Questions and Answers:

Practical 1: Setting up AWS Environment

What is IAM in AWS?
Answer: IAM (Identity and Access Management) enables you to manage access to AWS services and resources securely.

In simple words:

- IAM lets you create users, groups, and roles.
- You can control **who** can do **what** on **which AWS resources**.

1. Why is it important to secure the AWS root user after creating an AWS account? The root user has full administrative privileges; securing it prevents unauthorized access to critical AWS resources.

2. What is the purpose of creating an IAM user instead of using the root account for daily tasks? IAM users follow the principle of least privilege, reducing security risks compared to using the root account.

3. How do you set up the AWS CLI? What is the command used to configure it? Install the CLI and use `aws configure` command to set up access and secret keys, region, and output format.

4. Where does the AWS CLI store credential and configuration details? It stores them in the `.aws/credentials` and `.aws/config` files inside the user's home directory.

5. What is AWS Cloud9 and how is it useful for developers? AWS Cloud9 is a cloud-based IDE that provides code editing, running, and debugging tools directly in a browser.

6. How would you verify if the AWS CLI is correctly configured in your Cloud9 environment? By running `aws sts get-caller-identity` command.

7. What are the benefits of using Cloud9 compared to setting up a local development environment? No installation needed, environment is preconfigured, collaborative coding is possible, and access to AWS resources is seamless.

8. How can you attach an IAM role to Cloud9? While creating or editing an environment, you can assign an IAM role with required permissions.

9. What is the use of the command `aws sts get-caller-identity`? It returns details about the IAM user or role whose credentials are used to call the API.

10. What steps would you take if you lose access to your root user email? Contact AWS Support immediately; recovery is difficult without access to the root email.

Practical 2: Amazon RDS and QuickSight

1. What is Amazon RDS and which databases does it support? Amazon RDS is a managed relational database service supporting MySQL, PostgreSQL, SQL Server, Oracle, and MariaDB.

2. When setting up an RDS SQL Server database, why do we enable "public accessibility" initially? To allow remote connections during setup and initial configuration.

3. What security settings need to be configured to allow external access to an RDS instance? Modify the security group to allow inbound traffic from your IP address.

4. What is the role of security groups in accessing the RDS instance? Security groups act as firewalls controlling inbound and outbound traffic to the RDS instance.

5. What is Amazon QuickSight used for? QuickSight is a BI service for visualizing data and creating dashboards.

6. How does QuickSight connect securely to a private RDS database? Through a VPC connection that allows secure communication within AWS infrastructure.

7. What are the advantages of using Amazon QuickSight with RDS databases? Seamless integration, secure connection, real-time data visualization, and scalability.

8. Why do we create a VPC connection in QuickSight when accessing RDS data? To enable QuickSight to securely access databases within a private subnet.

9. After visualization, why is it recommended to make the RDS instance "not publicly accessible" again? To enhance security by limiting public access to the database.

10. Explain how you would create a dataset and visualize employee salary data from an RDS database in QuickSight. Connect RDS to QuickSight, create a dataset from the `newhire` table, and use fields like `ename` and `salary` to create a visualization.

Practical 3: WordPress with Lightsail

1. What is Amazon Lightsail and how is it different from EC2? Lightsail offers a simpler, pre-configured cloud VPS service compared to the highly customizable EC2.

2. Why do we connect a WordPress site to a Lightsail object storage bucket? To offload media files and reduce storage pressure on the WordPress instance.

3. What is the role of the WP Offload Media Lite plugin in WordPress? It uploads WordPress media files directly to the Lightsail bucket.

4. What permissions must be configured on the Lightsail bucket to allow WordPress access? The bucket must allow individual object public access and be attached to the WordPress instance's access role.

5. Why should we use HTTPS when serving files from a Lightsail bucket? To ensure data security and avoid mixed content issues on the website.

6. How do you verify if a media file uploaded in WordPress is stored in the Lightsail bucket? Check the file URL in the WordPress Media Library or verify in the Lightsail bucket.

7. What happens if you do not enable "Remove Files From Server" in WP Offload Media Lite plugin settings? Media files will be stored both on the Lightsail bucket and the instance, consuming extra storage.

8. What is the benefit of using Lightsail's object storage for WordPress media instead of storing them locally? It reduces local disk usage and improves website scalability and performance.

9. How can you attach a Lightsail instance to a bucket's access policy? Through the Lightsail console by selecting the bucket and attaching the instance under resource access settings.

10. Explain the importance of testing the connection after configuring WordPress and Lightsail bucket integration. To ensure media files are correctly uploaded and served from the bucket without any errors.