AWS Compute Questions:

1. What is the difference between EC2 and Lambda in AWS?
   compared to AWS Lambda, EC2 runs a full copy of the operating system and all the necessary hardware to run the OS. Lambda only needs a few system resources and dependencies to run a specific function.

2. Explain the concept of AWS Auto Scaling and how it works.

Auto-scaling continuously monitors your applications to make sure that they are operating at your desired performance levels. Auto-scaling automatically increases the capacity of constrained resources so you maintain a high quality of service.

3. Can you compare and contrast AWS Elastic Beanstalk and AWS *OpsWorks?*

Opsworks and beanstalk provide an easy way to deploy and manage your applications, but they differ in their deployment and communication methods.

opsworks uses chef or puppet as configuration management tools whereas beanstalk uses pre-configured environments for deployment

4. What is the purpose of Amazon ECS, and how does it differ from EKS?

EKS allows users to deploy, manage and scale containerised applications using kubernetes. ECS offers a choice of orchestrators, including its own native orchestrator, to manage containerised applications.

5. How do you configure custom AMIs (Amazon Machine Images) in AWS?

in the amazon console launch a new instance and choose community AMIs, copy the ami ID and enter in the search box. choose select to choose the AMI, then configure your instance.

6. What is AWS Fargate, and how does it simplify container management?

AWS fargate is a serverless compute engine for containers that allows you to run containers without managing the underlying structure. the Fargate you can taunt and scale containers without worrying about the underlying EC2 instances.

7. Describe the benefits and use cases of AWS Lambda Layers.

by moving dependencies into layers you can drastically reduce the size of your deployment package for lambda. this makes the lambda deployments quicker and reduces the amount of code storage space.

8. Explain the differences between AWS EC2 instance types, such as General Purpose, Compute Optimized, Memory Optimized, and Storage Optimized.

general purpose instance *- they provide a balance of compute, memory and networking resources, and can be used for a variety of diverse workloads. these instances are ideal for applications that use these resources in equal proportions such as web servers and code repositories.*

compute optimised instance - *compute-optimised instances deliver access to a large number of virtual cpus (but not dedicated physical cpus), with comparatively less storage and network*

memory optimised instance - *memory optimised instances are designed to deliver fast performance for workloads that process large data sets in memory*

storage optimised instance - *storage optimised instances are optimised for workloads that require high, sequential read and write access to very large data sets on local storage.*

9. How does AWS Spot Instances work, and when should they be used?

a spot instance in an instance that uses spare ec2 capacity that is available for less than the on-demand price. peace spot instances enable you to request unused ec2 instances at steep discounts you can lower your amazon ec2 costs significantly.

10. What is the AWS Systems Manager and its key features?

AWS systems manager allows you to safely automate common and repetitive IT operations and management tasks. you can use pre-defined playbooks or build, run and share automated play-books.

11. Explain the concept of AWS Nitro System and its significance.

the nitro system is a rich collection of building blocks that can be assembled in many different ways, giving us the flexibility to design and rapidly deliver ec2 instance types.

12. How do you achieve high availability for EC2 instances in AWS?

you achieve high availability by using availability zone which lets you distribute EC2 instances across locations and also by using elastic load balancers to spread traffic between them.

13. What is the purpose of Amazon EBS (Elastic Block Store), and how does it differ from Amazon S3?

s3 - stores large number of user files and backups where as

EBS - is block storage for amazon compute instances and is similar to hard drives attached to computers or laptops.

14. Describe the advantages of using AWS Lambda for serverless computing.

allows you to add custom logic to AWS resources such as S3 buckets and DynamoDB tables so you can easily apply compute to data as it enters or moves through the cloud.

15. How do you enable Enhanced Networking on Amazon EC2 instances?

You can use the command modify-instance-attribute in the AWS CLI or edit=EC2instanceattribute in AWS tools

16. What is the AWS Elastic Load Balancer (ELB), and what are its different types?

An Application Load Balancer routes traffic for HTTP-based requests. A Network Load Balancer routes traffic based on IP addresses. It is ideal for balancing TCP and User Datagram Protocol (UDP)-based requests. A Gateway Load Balancer routes traffic to third-party virtual appliances.

17. Explain the concept of AWS Elastic GPU and its use cases.
elastic GPUs support a range of Ec2 instance types enabling a developer to choose the optimal amount of memory, compute and storage resources for an application.

18. How can you use AWS Lambda to trigger actions in response to CloudWatch alarms?

you can configure event bridge:

-open choose open functions in the lambda console

-under function overview choose add trigger and set it to eventbridge and create a new rule

19. What is AWS Lambda Destinations, and how does it help with asynchronous invocations?

lambda queues the events before sending them to the function, for asynchronous invocation lambda places the event in a queue and returns a success response without additional information

20. Describe the AWS Greengrass service and its role in IoT edge computing.

AWS not freuengrass extends AWS to edge devices so they can act locally on the data they generate while still using the cloud for management, analytics and durable storage.

21. What is AWS Batch, and how does it simplify batch processing in the cloud?

AWS batch automatically provisions compute resources and optimises the workload distribution based on the quantity and scales of the workloads.

22. Explain the use of AWS Elastic Inference for deep learning workloads.

amazon elastic interface allows you to attach low-cost GPU powered acceleration to Amazon EC2 and pagemaker instances to reduct the cost of deep learning inference

23. How do you configure AWS App Runner for containerized applications?

you will have to configure your source code and run the app runner console and in the region list select your AWS region.

24. What is the AWS Elastic Container Registry (ECR), and how does it integrate with other AWS services?

ECR (elastic container registry) is an AWS managed container image service that is secure, scalable, and reliable.

25. Discuss the benefits of AWS Lambda@Edge and its use cases.

Lambda@Edge is a feature of amazon cloudfront the lets you run code closer to users of your application which improves performance and latency. use cases include configuring api gateways and serverless backend systems

AWS Storage Questions:

26. What is the difference between Amazon S3 and Amazon EBS storage?

s3 - can store large amounts of data of up to 100 buckets

EBS - has a standard limit of up to 20 volumes

27. Explain the various storage classes in Amazon S3 and their use cases.

s3 standard - used for general purposes and offers high durability, availability and performance. used for cloud applications, dynamic websites and content distribution.

s3 intelligent tiering - decreases user cost offering the same services

s3 standard infrequent access -access infrequently used data durable in all AZs and has high performance and action rate.

s3 glacier instant retrieval - provides low cost storage for archived data, milliseconds to access data and minimum object size should be 128kb

s3 one-zone instant access - stores data in a mnimm of 3 availability zones, costs 20% less than s3 standard, supports ssl and destruction of availability zone can damage data

s3 glacier flexible retrieval - low cost storage, free recoveries solution for backing up data.

s3 glacier deep archive - long term storage for large amount of data

28. How does Amazon EFS (Elastic File System) work, and when should it be used?

efs is a cloud based storage service for applications and workloads that run in AWS public cloud.

29. Describe the concept of Amazon FSx and its supported file systems.

FSx supports highly demanding enterprise applications and high performance workloads.

30. What is Amazon Glacier, and how is it used for archival storage?

s3 glacier storage class is purpose built for data archiving. providing high performance, high retrieval flexibility and low cost archive storage in the cloud.

31. How do you implement cross-region replication in Amazon S3?

you create a new S3 bucket with new IAM user. When configuring the bucket policy you have to initialise cross region replication.

32. What are AWS Storage Gateway's different types, and how are they used?

tape gateway - enables you to replace using physical tapes on premise with virtual tapes without changing existing backup workflows

amazon s3 file gateway -provdes a seamless way to connect to the cloud to store application data files and backup images.

FSx file gateway - new file gateway type provides low latency and efficient access.

Volume Gateway - offers cloud backed storage on on premises applications

33. Explain the purpose of AWS Snowball for large data transfers.

aws snowball is a data transport solution that accelerates moving terabytes to petabytes of data into and out of aws storage appliances.

34. How can you encrypt data at rest in Amazon S3 and EBS?

s3 encrypts your data before saving them on disks in aws data centres and then decrypts them when you download them.

EBS- when you create a new volume data is encrypted when attached to the supported instance type.

35. Describe the Amazon S3 Select feature and its advantages.
S3 select is a feature of s3 that let you specify targeted portions of an s3 object to retrieve and return to you rather than the entire content of the object. can increase speed of most programs, compatible with AWS lambda and other AWS tools.

36. What is AWS DataSync, and how does it facilitate data transfer between on-premises and AWS?
aws data sync is an online data transfer service that simplifies, automates and accelerates moving data between on-premises storage systems and AWS storage services

37. How does Amazon EBS snapshots work, and how are they used for data backup?
EBS snapshots and point in time copies of your data and can be used for disaster recovery, migrate data across regions and accounts and improve backup compliance.

38. What is the AWS Data Pipeline service, and how does it assist in data processing workflows?
aws data pipeline is a web service that makes it easy to schedule regular data movement and data processing activities in AWS cloud. Data pipeline integrates on-premises and cloud to allows developers to use their data then they need it.

39. Explain the benefits of Amazon S3 Object Lock and its use cases.
s3 object lock allows you store objects using a write-once-read-many (WORM) model. it can prevent deletion of objects or overwritten

40. How do you optimize costs when using Amazon S3 for data storage?

figure out exactly how to use s3, move objects to less expensive storage, enable intelligent tiering, speed up data transfers.

41. What is AWS Transfer Family, and how does it help with secure file transfer?

aws trnsfer family connectors are used to easily and reliably copy files between externally hosted servers and AWS storage services.

42. Describe the architecture of AWS Storage Gateway and its integration with on-premises environments.
It is a hybrid cloud service, fully managed and consists of both cloud and on-premises components, which can be deployed in several methods based on your on-premises infrastructure needs.

43. What is Amazon S3 Batch Operations, and when should it be used?
s3 batch operations is a managed solution for performing storage actions like copying and tagging objects at scale, whether for one-time tasks or recurring batch workloads

44. How can you achieve low-latency data access with Amazon EFS?

efs offers the performance modes, general purpose and max i/o, supports up to 55,000 IOPS and has the lowest latency

45. Explain the benefits of using Amazon S3 Access Points for managing access to S3 buckets.

s3 access points simplify how you manage data access for your application set to your shared datasets on s3.

AWS Database Questions:

46. Compare Amazon RDS (Relational Database Service) and Amazon Aurora in terms of features and performance.
amazon aurora and amazon rds both offer high performance availability features. aurora's rapid failover mechanisms and distributed storage make it better suite for demanding and critical applications. RDS provides multi AZ deployments for failover, ensuring redundant in a single region.

47. How does Amazon DynamoDB differ from traditional relational databases?
DynamoDB can manage structured or semistructured data including JSON document. SQL is the standard for storing and retrieving data.

48. Describe the architecture of Amazon Redshift and its suitability for data warehousing.

Redshift is fast, fully managed and cost effective data warehouse service. it gives you petabyte scale warehousing and exabyte scale data data analytics for which you only pay for what you use.

49. What is Amazon DocumentDB, and how does it support MongoDB-compatible workloads?

amazon document DB makes it easy to set up, operate and scle mongoDB compatible documents in the cloud. you run the same application code with same drivers

50. Explain the use of Amazon Neptune for graph database applications.

amazon neptune makes it simple to create and run applications that work with highly connected datasets for uses cases like identity graphs, knowledge graphs and fraud detection.

51. What is the purpose of Amazon Timestream, and how is it optimized for time-series data?

timestream saves you time and cost in managing the lifecycle of time-series data by keeping recent data in memory and moving historical to cost-optimised storage.

52. Compare Amazon ElastiCache and Amazon RDS in terms of use cases and caching mechanisms.

elasticache - has fast in-memory data store for sue as a database, cache and message broker.

amazon RDS - manages backups, software patching, automatic failure detection and recovery.

53. How do you enable Multi-AZ deployments in Amazon RDS, and what is their purpose?
amazon RDS is a multi AZ deployment, automatically creates primary database instance and synchronously replicates data to an instance in a different AZ.

54. Describe the benefits of Amazon QLDB (Quantum Ledger Database) for ledger applications.

amazon QLDB is a fully managed ledger database that provides a transparent, immutable and cryptographically verifiable transaction log owned by a central trusted authority.

55. What is Amazon Keyspaces (for Apache Cassandra), and how does it differ from self-managed Cassandra clusters?

with keyspaces you can run your cassandra workloads on AWS using the same cassandra application code and developer tools that you use today.

56. Explain the concept of read replicas in Amazon RDS and how they improve database performance.
gives enhanced performance and you can reduce the load on your source DB instance by routing read queries form your applications to read the replica.

57. How does Amazon DMS (Database Migration Service) assist in database migration and replication?

data migration service help your migrate your databases to amazon web services with virtually no downtime. all data changes o the source dabs that occur during migration are continuously replicated to the targeted

58. What is AWS Glue, and how does it simplify ETL (Extract, Transform, Load) processes?

aws glue provides both visual and code-based interfaces to make data integration easier. users can more easily find and access data using AWS glue catalog, data engineers, and ETL (extract, transform and load) engineers can visually create, run and monitor.

59. Discuss the use of Amazon RDS Proxy for database scalability.
ads proxy is a fully managed database proxy service that streamlines and enhances database connection management. acts as an intermediary between your application and the database instances optimising connections and seamless connectivity

60. How can you optimize query performance in Amazon Redshift?
check to see if you're running out of space, write spefic well-structured queries and stagger ETL process to avoid overlap.

61. What is Amazon Managed Blockchain, and what are its supported blockchain frameworks?

amazon blockchain eliminates the heavy lifting involved in the setup of blockchain networks by reducing 60% of time taken in hosting hyper ledger fabric frameworks.

62. Explain the advantages of Amazon Aurora Multi-Master for high availability and write scaling.

aurora offers several scalability options, including allowing for the addition of up to 15 read replicas for single databases cluster, the support auto-scaling and read replicas.

63. Describe the differences between Amazon Neptune and Amazon Timestream for graph and time-series data, respectively.
each of theses databases supports a specific workload type. all three are fully managed and QLDB and Timestream are serverless databases. neptune is a graph database that allows you to tun queries to quickly find out the connections and relationship between data items.

64. How do you implement data encryption at rest and in transit for Amazon RDS instances?

use secure socket layer/transport layer security connections to encrypt data in transit. encrypt data at rest using KMS.

65. What is Amazon RDS Performance Insights, and how does it assist in database performance monitoring?

performance insights automatically collects all the necessary perforce metrics and manages the resources needed to monitor your databases.