

Introduction To Cloud Computing (CS4037)

Date: December 29, 2025

Final Exam

Total Time (Hrs.): 3
Total Marks: 70
Total Questions: 70

Course Instructors

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Roll No

Section

Student Signature

Instructions:

1. Answer all MCQs on this question paper by *circling one correct choice* out of four.
2. Each MCQ carries the same marks (1 mark).
3. Clearly select *one option* in each question. Any overwriting or cutting will result in 0 for that MCQ.
4. For visual clarity, options are unnumbered and placed within boxes.
5. Do any necessary working on your scratch paper. Attach your scratch paper with this exam.
6. Good luck and you may start your exam now.
7. **Attention Invigilators:** Students may use one scratch sheet; no exam answer sheet required.

CLO 1: Comprehend the theoretical foundations of cloud computing, covering essential artifacts, service models, virtualization technologies, and security baselines.

CLO 2: Apply foundational AWS services to architect basic cloud solutions, utilizing the AWS Academy environment to gain practical proficiency aligned with Cloud Practitioner certification standards.

CLO 3: Evaluate distinct cloud architectures and mechanisms, and conduct a comparative analysis of leading cloud service providers.

1. "Startup GenZTech" wants to launch a new app but has zero budget for building a physical data center. Which advantage of cloud computing allows them to launch immediately without upfront hardware costs?

Increase speed and agility	Trade capital expense for variable expense	Stop guessing capacity	Go global in minutes
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2. Your boss, Karen, is worried that moving to the cloud means she loses control over her physical hard drives. Which cloud deployment model should she use if she wants to keep her sensitive legacy data in her own basement but use AWS for her website?

All-in Cloud	Private Cloud (On-premises)	Hybrid Cloud	Public Cloud
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3. In the "Shared Responsibility Model," AWS is responsible for the "Security of the Cloud." Which of the following does AWS handle?

Your customer's credit card data	Setting up your user passwords	Physical security of the data centers	Updating the Guest Operating System on your EC2 instance
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4. Bob wants to create a digital "ID card" for a new employee, Alice, so she can log into the AWS Console. Which service handles users, groups, and permissions?

AWS Shield	AWS IAM	Amazon Inspector	AWS KMS (Key Management Service)
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5. You are building a virtual fence around your cloud resources to define your own network space. What is this service called?

Amazon VPC	Amazon DX (Direct Connect)	Amazon VPN	Amazon Route 53
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6. Which AWS pricing model is best described as "Pay only for what you use, when you use it"?

Pay-as-you-go	Reserved Instances	Dedicated Hosts	Upfront Contract Pricing
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7. If you want to put a "guard" at the door of your specific EC2 server to allow only SSH traffic (Port 22), what do you configure?

Network Access Control List	Security Group	Internet Gateway	VPC Peering
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8. What is the main purpose of an Edge Location in AWS?

To host secret government data	To cache content closer to end-users to reduce latency	To act as a backup for the main Region	To generate Bitcoin
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9. A developer wants to run a piece of code every time someone uploads a photo, but they don't want to manage or patch any servers. Which compute service should be used in this scenario?

Amazon EC2	Amazon Lightsail	AWS Lambda	AWS Fargate
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10. Which pillar of the AWS Well-Architected Framework focuses on the ability to recover from failures and mitigate disruptions (like a server crashing)?

Operational Excellence	Reliability	Performance Efficiency	Cost Optimization
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11. You need a database that is "Relational" (uses tables, rows, and SQL) but you want AWS to manage the patching and backups. Which service do you choose?

Amazon DynamoDB	Amazon S3	Amazon RDS	Amazon Redshift
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12. What is the "Root User" in an AWS account?

The first user you create in IAM	A standard user with read-only access	The account owner with unrestricted access	The automatic bot that scans for viruses
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13. Which service would you use to register a new domain name like "www.MyAwesomeCloudClass.com"?

Amazon CloudFront	Amazon Route 53	AWS Direct Connect	Elastic Load Balancing
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14. "PizzaPalace" has a website that gets very little traffic on Mondays, but huge traffic on Friday nights. They are tired of their servers crashing on Fridays. Which AWS feature helps them automatically add more servers when traffic spikes?

Amazon Auto Scaling	Amazon CloudFront	AWS Global Accelerator	Amazon Inspector
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15. You have launched a web server in a private subnet. It needs to download a software patch from the internet, but the internet cannot initiate a connection to the server. What device do you need in your VPC?

Internet Gateway (IGW)	NAT Gateway	Virtual Private Gateway	Egress-Only Internet Gateway
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16. A law firm needs to store client archives for 7 years to meet compliance laws. They will likely never look at these files again, but they must keep them. Which S3 storage class saves them the MOST money?

S3 Standard	S3 Intelligent-Tiering	S3 Standard-IA (Infrequent Access)	S3 Glacier Deep Archive
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17. Your developer, Dave, accidentally posted his AWS Access Keys on GitHub. A hacker is now mining crypto on your account. Which service could have alerted you to this security breach automatically?

AWS Trusted Advisor (or GuardDuty)	AWS Shield	Amazon Route 53	AWS Artifact
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18. You are running a legacy application that requires a hard drive to be attached to the instance. The data must persist even if the instance is stopped. Which storage type do you use?

Amazon S3	Amazon EFS	Amazon EBS	Amazon Instance Store
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19. A startup creates a mobile game where millions of users read and write scores simultaneously. The database needs to be super fast (single-digit millisecond latency) and non-relational (NoSQL). Which service is the best fit?

Amazon RDS for MySQL	Amazon Redshift	Amazon DynamoDB	Amazon Aurora
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20. You have a web application running on 5 EC2 instances. You want to ensure that if one instance fails, the traffic is automatically redirected to the healthy instances. What should you put in front of your instances?

Amazon CloudWatch	Elastic Load Balancer (ELB)	Auto Scaling Group	CloudTrail
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21. Which of the following is an example of "Operational Excellence" in the Well-Architected Framework?

Paying the lowest price possible for EC2	Automating changes with code to reduce human error	Using the strongest encryption available	Storing data in three different regions
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22. A company wants to migrate a 50TB database to AWS, but their internet connection is slower than a dial-up modem. It would take years to upload. What physical device can AWS send them to copy data onto and ship back?

AWS Direct Connect	AWS Snowball	AWS Storage Gateway	Amazon S3 Transfer Acceleration
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23. You are designing a system that must survive a total power outage in one city. How should you structure your EC2 instances?

Put all instances in one Availability Zone	Put instances in multiple Availability Zones within the same Region	Put all instances in a single Edge Location	Put all instances in a subnet with no internet access
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24. Your boss asks, "How much money did we spend on EC2 last month vs. S3?" Which tool gives you a visual dashboard of your costs and usage?

AWS Cost Explorer	AWS Budgets	AWS TCO Calculator	AWS Consolidated Billing
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25. A hacker is trying to take down your website by flooding it with fake traffic (DDoS attack). Which AWS service is designed specifically to protect against this?

AWS WAF (Web Application Firewall) & Shield	Amazon Inspector	AWS IAM	Amazon Macie
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26. You need to run a complex data analysis query on a petabyte of historical sales data. You don't want to slow down your main website's database. Which "Data Warehousing" service should you use?

Amazon DynamoDB	Amazon RDS	Amazon Redshift	Amazon ElastiCache
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27. Which IAM "identity" is best suited for an EC2 instance that needs to access an S3 bucket (so you don't have to save passwords on the server)?

IAM User	IAM Group	IAM Role	IAM Policy
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28. You want to receive an email alert whenever your CPU utilization on your main server goes above 80%. Which two services work together to do this?

CloudTrail and Route 53	CloudWatch and SNS	ELB and Auto Scaling	Config and Trusted Advisor
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29. A company strictly forbids using any database engine other than MySQL. Which AWS service allows them to check if anyone violates this rule across their entire account?

AWS Config	AWS CloudTrail	Amazon CloudWatch	AWS Systems Manager
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30. You have a website with static images (logos, headers) that users in Australia are loading slowly because your server is in Virginia. How do you speed this up without moving the server?

Enable CloudFront (CDN)	Increase the size of the EC2 instance	Use Amazon EBS Provisioned IOPS	Use AWS Global Accelerator
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31. A user reports they cannot connect to your web server via HTTP. You check the Security Group and see an "Allow HTTP" rule. You check the Network ACL (NACL) and see an "Allow HTTP" inbound rule, but no outbound rule. Why is the connection failing?

Security Groups are stateless and need an outbound rule.	NAACLs are stateless and require an explicit outbound allow rule for return traffic.	The VPC needs an Internet Gateway attached.	The user is on a VPN.
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32. You are designing a "loosely coupled" architecture. Component A sends data to Component B. If Component B crashes, you don't want the data from Component A to be lost. What service should sit in the middle to hold the messages?

Amazon SNS (Simple Notification Service)	Amazon SQS (Simple Queue Service)	AWS Step Functions	Amazon SES (Simple Email Service)
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33. A company calculates that they will need exactly 4 servers running 24/7 for the next 3 years for a steady database workload. Which EC2 pricing model provides the biggest discount (up to 72%)?

On-Demand Instances	Spot Instances	Reserved Instances	Dedicated Hosts
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34. You need to grant a temporary consultant access to your S3 bucket for 4 hours only. What is the most secure way to do this?

Create a new IAM User and email them the password.	Give them your Root account credentials.	Assume a Role that provides temporary security credentials.	Open the S3 bucket to the public.
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35. Your application requires a file system that can be mounted by 100 Linux EC2 instances at the same time to share files. S3 is not fast enough for the locking mechanism. What do you use?

Amazon EBS	Amazon EFS	Amazon S3 Glacier	Amazon Instance Store
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36. You are auditing your AWS account. You need to know exactly who deleted a specific S3 bucket and at what time yesterday. Which service provides this audit log?

Amazon CloudWatch	AWS CloudTrail	AWS Config	AWS Artifact
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37. A startup wants to use Spot Instances to save money on image processing. What is the major risk they must design their application to handle?

Spot instances are slower than normal instances.	Spot instances can be terminated by AWS with a 2-minute warning.	Spot instances do not have IP addresses.	Spot instances can only run Windows.
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38. You have a "Subnet" with a CIDR block of 10.0.1.0/24. You want to ensure that no traffic from a specific malicious IP address (123.45.67.89) can enter this subnet. Where do you block it?

Security Group (Inbound Rule)	Network ACL (Inbound Deny Rule)	Route Table	Internet Gateway
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39. Which service analyzes your AWS environment and provides "Red/Yellow/Green" recommendations regarding Cost, Performance, Security, Fault Tolerance, and Service Limits?

AWS Trusted Advisor	AWS Cost Explorer	AWS Inspector	AWS Shield
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40. A global bank requires a database that spans three AWS Regions (US, Europe, Asia) and allows local reads/writes in all three regions with data synchronizing automatically. Which Aurora feature achieves this?

Aurora Serverless	Aurora Global Database	Read Replicas	Multi-AZ Deployment
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41. You want to run a Docker container application. You want to use Kubernetes to manage it, but you don't want to install or maintain the Kubernetes "Control Plane" (master nodes). Which service do you use?

Amazon ECS	Amazon EKS	AWS Fargate	Amazon EC2
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42. What is the difference between an EBS Volume and an Instance Store volume?

EBS is temporary; Instance Store is permanent.	EBS persists after instance stop; Instance Store data is lost if the instance stops (ephemeral).	EBS is object storage; Instance Store is block storage.	There is no difference.
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43. Your CFO wants to track costs by "Project" (e.g., Project Alpha vs. Project Beta). The resources are all mixed in the same AWS account. How can you separate the costs on the bill?

Create separate VPCs for each project.	Use AWS Cost Allocation Tags.	Use CloudWatch Alarms.	It is impossible; you must open different AWS accounts.
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44. A developer is designing a system that must have 99.999% availability. Which architectural pattern should they generally avoid?

Tightly coupled components (monolithic).	Loosely coupled components (microservices).	Multi-AZ deployment.	Horizontal scaling.
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45. Why is AWS CloudFormation considered "Infrastructure as Code"?

It allows you to write Java code to run servers.	It allows you to define your infrastructure (VPCs, Instances) in a JSON/YAML template file.	It is a coding IDE in the browser.	It automatically converts Python code into C++.
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46. You are building a video streaming app. You want to upload videos to S3, which triggers a Lambda function to compress them, which then saves metadata to DynamoDB. This is an example of what type of architecture?

Event-Driven Architecture	Monolithic Architecture	On-Premises Architecture	High-Performance Computing (HPC)
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47. You are managing a fleet of EC2 instances and want to know if any of them are underutilized (idle) so you can save money. Which AWS service gives you this specific recommendation?

AWS Trusted Advisor	AWS CloudTrail	AWS Config	Amazon Connect
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48. If you lose your "Private Key" file (.pem) for an EC2 instance, what can AWS Support do?

They can email you a copy of the key.	They can reset the password remotely.	Nothing. AWS does not store your private keys.	They can unlock the instance with a master key.
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49. Which AWS support plan gives you access to a dedicated Technical Account Manager (TAM) who acts as your personal concierge?

Basic Support	Developer Support	Business Support	Enterprise Support
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50. You are storing sensitive medical records in S3. You are terrified that an intern might accidentally delete the files. What S3 feature acts like a "recycle bin," allowing you to restore deleted or overwritten files?

S3 Transfer Acceleration	S3 Versioning	S3 Encryption	S3 Multipart Upload
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51. You are designing a database for a social media app. The data is unstructured (posts, likes, comments) and the volume is massive. A relational database (SQL) is struggling to keep up. What should you switch to?

Amazon Redshift	Amazon DynamoDB	Amazon EFS	Amazon Glacier
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52. You want to ensure that no one accesses your S3 bucket unless they are coming from a specific IP address within your corporate office. What is the best way to apply this rule specifically to the Bucket?

Network ACL	Security Group	S3 Bucket Policy	IAM User Policy
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53. You are launching a new EC2 instance. You want it to automatically install software (like Apache Web Server) as soon as it boots up. Where do you put the script?

In the "User Data" field.	In the IAM Role.	In the Security Group description.	In the Tags.
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54. Which of the following is an example of "Decoupling" your architecture?

Connecting your web server directly to the database.	Using an SQS queue between your web server and your video processing server.	Hardcoding IP addresses in your code.	Running everything on one giant computer.
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55. You have an application that requires extremely high disk performance (IOPS) for a MongoDB database. The standard EBS volume is too slow. Which volume type should you choose?

Cold HDD (sc1)	Throughput Optimized HDD (st1)	Provisioned IOPS SSD (io1/io2)	Magnetic (Standard)
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56. A developer wants to test an application on AWS but is afraid of accidentally spending \$1,000. What can they set up to get an email if their bill crosses \$10?

AWS Budget Alarm	AWS Cost Explorer	AWS Shield	AWS Artifact
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57. You need to verify that your AWS setup meets the credit card industry's security standards (PCI DSS). Where can you find AWS's compliance reports?

AWS Artifact	AWS Inspector	AWS Secrets Manager	Amazon GuardDuty
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58. Why would a company choose Amazon Aurora over a standard MySQL deployment on RDS?

Aurora is free.	Aurora offers up to 5x the performance of standard MySQL and is fault-tolerant by design.	Aurora is a NoSQL database.	Aurora runs on the user's local laptop
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59. A user accidentally deleted a critical table in your RDS database at 2:00 PM. How can you recover it?

You cannot; it is gone forever.	Use "Point-in-Time Recovery" to restore the database to 1:55 PM.	Use Amazon S3 versioning.	Restart the database instance.
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60. Your web application is stateless and runs on EC2. You want to store the "Session State" (e.g., user shopping cart data) so that if a server fails, the user doesn't lose their cart. Which service is best for storing this fast-access session data?

Amazon Glacier	Amazon ElastiCache (Redis/Memcached)	Amazon Redshift	Amazon EBS
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61. You are designing a VPC. You have a database in a private subnet. You need to administer it securely from your home office. You do NOT want to open Port 3306 to the entire internet. What is the most secure common pattern?

Put the database in the public subnet	Use a "Bastion Host" (Jump Box) in the public subnet and allow SSH/RDP only from your IP.	Open all ports on the Network ACL.	Use S3 to host the database.
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62. You need to monitor your EC2 memory usage (RAM). You look at the standard CloudWatch metrics but only see CPU, Network, and Disk. Why?

CloudWatch is broken	RAM is a custom metric; you must install the CloudWatch Agent on the instance to track it.	AWS does not allow you to see RAM usage for privacy reasons.	You must upgrade to Enterprise Support.
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63. A hacker is trying to guess your IAM User passwords by brute force. Which IAM policy setting prevents this?

Password Policy (Account Settings) to enforce complexity and rotation	MFA	S3 Bucket Policy	CloudFront Geo-Restriction
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64. You have an S3 bucket with "Object Lock" enabled in Compliance Mode. A legal admin tries to delete a file before the retention period expires. What happens?

The file is deleted	The file is moved to Glacier	The deletion is blocked; not even the root user can delete it until the retention period passes	The admin receives a warning but can proceed
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65. You are running a monolithic legacy application on a single large EC2 instance. It cannot be refactored. How do you achieve "Self-Healing" if the instance crashes?

Use an Auto Scaling Group with a Minimum size of 1 and Maximum size of 1.	Use CloudFront	Use Amazon Connect	You cannot make a single instance self-healing.
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66. You have 100 TB of data in S3 Standard. You notice that 50% of the data hasn't been accessed in 6 months. You want to automatically move that cold data to S3 Glacier to save money. What do you configure?

S3 Lifecycle Policy	S3 Cross-Region Replication	AWS Storage Gateway	AWS Snowball
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67. You have designed a tightly coupled application that relies on two separate services: Service A and Service B. Service A has an availability of 99.0%. Service B also has an availability of 99.0%. For your application to function, both services must be operational at the same time. What is the total availability of your application?

99.9%	99.5%	99.0%	98.01%
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68. You are storing 10,000,000 (10 million) unique objects in Amazon S3 Standard storage. AWS claims this storage class provides 99.999999999% (11 9s) durability. Based on these statistics, what is the expected average time duration you would have to wait to lose a single object?

100 years	1,000 years	10,000 years	1,000,000 years
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69. You are designing a critical banking backend using a High Availability (HA) cluster with two identical servers running in an Active-Active configuration. The system remains operational as long as at least one server is running. Each individual server has the following reliability statistics: MTTF (Mean Time To Failure): 900 hours and MTTR (Mean Time To Repair): 100 hours. The cost of system downtime is \$10,000 per hour. What is the expected annual financial loss (approximate) due to system downtime? (Assume 1 year = 8,760 hours. Round intermediate availability percentages to 4 decimal places.)

\$87,600	\$8,760	\$876,000	\$87.60
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70. You have a microservices application running on Amazon ECS (Fargate launch type). The application architecture relies heavily on path-based routing (Layer 7) to direct incoming traffic to different microservices (e.g., /api/payments vs /api/orders). A strategic business partner wants to consume your API securely from their own AWS account. They have the following strict requirements: The connection must use AWS PrivateLink (VPC Endpoint) so traffic never traverses the public internet. Your application must present a valid public TLS certificate (HTTPS) to the partner's client. The partner's firewall team requires your service to have a single, static private IP address per Availability Zone that does not change. Which architectural pattern in the following meets all requirements?

Deploy an Application Load Balancer (ALB). Enable "Cross-Zone Load Balancing." Create a VPC Endpoint Service directly attached to the ALB.
Deploy a Network Load Balancer (NLB). Configure a TCP listener on port 443 that passes encrypted traffic directly to the Fargate tasks. Configure the Fargate tasks to inspect the path and route locally
Deploy an Application Load Balancer (ALB) to handle the path-based routing and TLS termination. Deploy a Network Load Balancer (NLB) in front of the ALB. Create a Target Group for the NLB with a target type of 'ALB'. Create the VPC Endpoint Service and attach it to the NLB.
Deploy a Gateway Load Balancer (GWLB). Configure a GENEVE listener to intercept traffic. Route traffic to a fleet of virtual appliances running Nginx for path-based routing.