Questions likely to be on the exam

1   Describe Cloud concepts

1.1   Describe the benefits and considerations of using cloud services

1. Describe terms such as High Availability, Scalability, Elasticity, Agility, Fault Tolerance, and Disaster Recovery

> **Solution:**
>
> High Availability - The ability of the application to continue running in a healthy state without significant downtime.
> Scalability - Adding more or removing resources when needed
> Elasticity - Automatically adding more resources to handle traffic
> Agility - Fast to set up
> Fault Tolerance - Able to continue running despite a fault, if one component fails, another takes over
> Disaster recovery - Able to recover data after an issue

2. Describe the principles of economies of scale

> **Solution:**
>
> By purchasing and using in larger quantities, a discount is available, making costs less

3. Describe the differences between Capital Expenditure (CapEx) and Operational Expenditure (OpEx)

> **Solution:**
>
> Capital expenditure is spending on equipment, such as servers. Operational expenditure is spending that continues throughout the usage of a product, such as power costs

4. Describe the consumption-based model

> **Solution:**
>
> A user will only pay for what they use

1.2   Describe the differences between Infrastructure-as-a-Service (IaaS), Platform-as-a-Service (PaaS) and Software-as-a-Service (SaaS)

5. Describe Infrastructure-as-a-Service (IaaS)

> **Solution:**
>
> Gives control over hardware, user is responsible for everything but the running of the hardware

6. Describe Platform-as-a-Service (PaaS)

> **Solution:**
>
> Don't have to manage the infrastructure, provides an environment for building, testing and deploying software applications

7. Describe Software-as-a-Service (SaaS)

> **Solution:**
>
> Only responsible for the data and access.

8. Compare and contrast the three different service types

> **Solution:**
>
> All service types have no upfront costs.
>
> Software as a Service is cheapest, then platform, then infrastructure as the users have greater control.

1.3   Describe the differences between Public, Private and Hybrid cloud models

9. Describe Public cloud

> **Solution:**
>
> No local hardware, all running on the cloud providers hardware

10. Describe Private cloud

> **Solution:**
>
> Cloud set up in own datacenter

11. Describe Hybrid cloud

> **Solution:**
>
> Combining public and private clouds

12. Compare and contrast the three different cloud models

> **Solution:**
>
> Hybrid cloud is the most expensive, but also offers the greatest flexibility.
>
> Private and hybrid clouds are best for when compliance is important.
>
> Private and hybrid clouds also are good for when legacy systems need to keep going
>
> Public cloud is best for when scalability and agility is important.

2 Describe Core Azure Services

2.1 Describe the core Azure architectural components

13. Describe Regions

> **Solution:**
>
> A geographical area on the planet containing at least one, but potentially multiple datacenters networked together

14. Describe Availability Zones

> **Solution:**
>
> Physically separate datacenters within an Azure Region

15. Describe Resource Groups

> **Solution:**
>
> A logical container for resources deployed on Azure

16. Describe Azure Resource Manager

> **Solution:**
>
> A service for managing resources within Azure

17. Describe the benefits and usage of core Azure architectural components

> **Solution:**
>
> Regions - Used to ensure the data is kept close to users to increase performance
> Availability Zones - Allow for backup to ensure data is kept online
> Resource groups - Allow for managing resource use
> Azure Resource Manager - Ensure the correct amount of resources are allocated to services

2.2   Describe some of the core products available in Azure

18. Describe products available for compute

> **Solution:**
>
> Virtual Machines - Windows or Linux simulated machines
> Virtual Machine scale sets - Scaling for Azure Virtual Machines
> Azure Container Instances - Run containerised apps on Azure without provisioning servers or VMs
> Azure Kubernetes Service - Enables management of a cluster of VMs that run containerised services

19. Describe products available for Networking

> **Solution:**
>
> Virtual Network - Connecting VMs to incoming VPN connections
> Load Balancer - Balances inbound and outbound connections to apps or service endpoints
> VPN gateway - Access Azure Virtual Networks through VPN gateways
> Application gateway - Optimizes app delivery while increasing security
> Content Delivery Network - Provides high bandwidth content to customers

20. Describe products available for Storage

> **Solution:**
>
> Blob storage - Storage for very large objects
> Disk storage - Disks for Virtual Machines
> File storage - File shares you can access like a file storage
> Archive storage - Storage that is not accessed frequently

21. Describe products available for Databases

> **Solution:**
>
> CosmosDB - NoSQL database
> Azure SQL Database - Fully managed relational database
> Azure Database for MySQL - Fully managed MySQL database
> Azure Database for PostgreSQL - Fully managed PostgreSQL database
> Azure Database Migration service - Migrate databases to the cloud

22. Describe the Azure Marketplace and its usage scenarios

> **Solution:**
>
> Azure Marketplace allows you to purchase third party services which integrate with Azure

2.3 Describe some of the solutions available on Azure

23. Describe IoT Products on Azure

> **Solution:**
>
> IoT Hub - Messaging hub for IoT devices
> IoT central - IoT Software as a Service

24. Describe Big data and Analytics Products on Azure

> **Solution:**
>
> Azure Synapse Analytics - Fully managed data warehouse
> HDInsight - Process data with Hadoop in the cloud
> Azure Databricks - Collaborative Apache Spark based analytics

25. Describe AI Products on Azure

> **Solution:**
>
> Azure Machine Learning Service - In depth machine learning
> Azure Machine Learning Studio - Drag and drop machine learning

26. Describe Serverless Products on Azure

> **Solution:**
>
> Azure Functions - Event driven, serverless compute service
> Logic Apps - Execute workflows designed to automate business scenarios from blocks Event Grid - Want to do multiple things based on the information that is coming in

27. Describe DevOps Products on Azure

> **Solution:**
>
> Azure DevOps - Git Repos and Kanban boards
> Azure DevTest Labs - Windows and Linux environments for testing

2.4 Describe Azure Management tools

28. Describe Azure Tools

> **Solution:**
>
> Azure Portal - Access with any web browser
> Azure Powershell - Module for windows powershell or powershell core
> Azure CLI - Cross platform including with bash
> Cloud Shell - Browser accessible shell

3   Describe Security, Privacy, Compliance and Trust

3.1   Describe securing network connectivity in Azure

29. Describe Network Security Groups

> **Solution:**
>
> This allows or denies inbound network traffic to your Azure Resources in a similar way to a firewall

30. Describe Application Security Groups

> **Solution:**
>
> Allows you to group computers by name to manage them easier

31. Describe User Defined Routes

> **Solution:**
>
> Static routes in Azure to override Azure's default system routes

32. Describe Azure Firewall

> **Solution:**
>
> A firewall to protect Azure apps

33. Describe Azure DDoS protection

> **Solution:**
>
> Protection for Azure Apps against DDoS attacks

3.2   Describe core Azure Identity Services

34. Describe the difference between Authentication and Authorisation

> **Solution:**
>
> Authentication - Establish the identity of a person or service looking to access a resource
> Authorization - Establish what level of access an authenticated person or service has

35. Describe Azure Active Directory

> **Solution:**
>
> Azure Active directory is a service to manage identity in Azure. Including Authentication.

36. Describe Azure Multi Factor Authentication

> **Solution:**
>
> Authentication with something you know, something you are and something you have

3.3   Describe the security tools and features of Azure

37. Describe Azure Security Center

> **Solution:**
>
> This provides security recommendations and monitors services for security vulnerabilities

38. Describe Azure Key Vault

> **Solution:**
>
> This is a place to store secrets such as keys and passwords

39. Describe Azure Information Protection

> **Solution:**
>
> This is a solution to classify and optionally protect documents by applying labels

40. Describe Azure Advanced Threat Protection

> **Solution:**
>
> This is a solution to identify, protect and help to investigate threats

3.4   Describe Azure Governance Methodologies

41. Describe Policies and Initiatives with Azure Policy

> **Solution:**
>
> Policy - A rule applied to a scope of resources
> Initiative - A group of policies to help track compliance

42. Describe Role Based Access Control

> **Solution:**
>
> Giving users or services permissions based on roles provided to them

43. Describe Locks

> **Solution:**
>
> This is a solution to prevent the accidental deletion of a resource

44. Describe Azure Advisor security assistance

> **Solution:**
>
> Get proactive, actionable and personalised best practice recommendations

45. Describe Azure Blueprints

> **Solution:**
>
> A declarative way to orchestrate the deployment of various resource templates and other artefacts

3.5 Describe monitoring and reporting options in Azure

46. Describe Azure Monitor

> **Solution:**
>
> Maximising the availability and performance of applications using telemetry

47. Describe Azure Service Health

> **Solution:**
>
> Provides guidance when issues with Azure affect you

48. Describe the use cases and benefits of Azure Monitor and Azure Service Health

> **Solution:**
>
> Azure Monitor - Your configuration could be improved
> Azure Service Health - An Azure problem is going to affect your service

3.6   Describe privacy, compliance and data protection standards in Azure

49. Describe industry compliance terms such as GDPR, ISO and NIST

> **Solution:**
>
> GDPR - Data stored has to have a reason and can be requested to be deleted
> ISO - Range of compliances, notably 27001 for information security management
> NIST - Government standards

50. Describe the Microsoft Privacy Statement

> **Solution:**
>
> A statement saying what Microsoft is doing with you data in Azure

51. Describe the Trust Center

> **Solution:**
>
> Details as to how Microsoft implements and supports security, privacy, compliance and transparency

52. Describe the Service Trust Portal

> **Solution:**
>
> Hosts the compliance manager service and contains Microsoft audit reports

53. Describe the Compliance Manager

> **Solution:**
>
> Allows you to ensure that you are compliant

54. Describe Azure Government Cloud Services

> **Solution:**
>
> Azure services for the US Government with dedicated datacenters and different levels of compliance

55. Describe Azure China cloud services

> **Solution:**
>
> Azure provided within China in partnership with 21Vianet

4 Describe Azure Pricing, Service Level agreements and Lifecycles

4.1 Describe Azure subscriptions

56. Describe an Azure Subscription

> **Solution:**
>
> A logical container for resources in Azure

57. Describe the uses and options with Azure subscriptions such access control and offer types

> **Solution:**
>
> Access Control - Subscriptions can be managed with RBAC so only certain users can access them
> Offer types - Monthly credits given in partnership with a Visual studio subscription

58. Describe subscription management using Management groups

> **Solution:**
>
> Management groups allow you to order your Azure resources hierarchically into collections, which provide a further level of classification that is above the level of subscriptions

4.2 Describing planning and management of costs

59. Describe options for Purchasing Azure products and services

> **Solution:**
>
> You can purchase directly on the web, enter an enterprise agreement or an agreement with a CSP (Cloud Solution Provider)

60. Describe options around Azure Free account

> **Solution:**
>
> You can have a 12 month trial, including $300 in credits, then some services are always free after that

61. Describe the factors affecting costs

> **Solution:**
>
> Resource types - Larger VMs will cost more etc
> Services - Your pricing depends on how you purchase Azure
> Locations - Some areas are more expensive than others
> Ingress and egress traffic - The more traffic you have, the greater the costs

62. Describe Zones for billing purposes

> **Solution:**
>
> There are zones that it costs a certain amount to send data between

63. Describe the pricing calculator

> **Solution:**
>
> This allows you to configure and estimate the costs for Azure products and features for your specific resources

64. Describe the Total Cost of Ownership Calculator

> **Solution:**
>
> This allows you to estimate the savings you would get by transferring services from on premises to Azure

65. Describe best practices for minimizing Azure costs

> **Solution:**
>
> Spending limits and quotas - Get notification when spending gets to a certain level
> Tags - Tag resources so you know how much projects cost
> Azure reservations - Reserve a resource for 1 or 3 years for a saving
> Azure Advisor Recommendations - Such as scaling down an underutilized VM

4.3 Describe Azure Service Level agreements

66. Describe a Service Level Agreement

> **Solution:**
>
> A performance target to a product or service

67. Describe Composite SLAs

> **Solution:**
>
> The SLA of a range of applications working together

4.4 Describe Service Lifecycle in Azure

68. Describe Public and Private Preview features

> **Solution:**
>
> Public - Available to all users
> Private - Invitation only

69. Describe General Availability

> **Solution:**
>
> When a feature is released as part of Azure's default product set after evaluation and testing

70. Describe how to monitor feature updates and product changes

> **Solution:**
>
> Use the Azure updates page or the What's new link in the help menu