1. **What service offering are Azure Virtual Machines?:** Iaas or Infrastructure as a service
2. **How are Virtual networks (VNets) used to help Azure Virtual Machines?: -** They allow VMs and services to access one another, by default you cannot connect to services not within your virtual network.
3. **What are good naming conventions to impliment into your vm names?:** Environment, Location, Instance, Product or Service, Role
4. **Whats a good practice for location of your VM?:** Place it as close as possible to your users. Not all regions are the same so check price and options available in that region.
5. **What are the two separate costs you will be charged with VMs?:** Compute and Storage
6. **What payment options do you have for compute costs?:** Consumption-based, or Reserved Virtual Machine Instances.
7. **What needs to happen so that you can resize a VM?:** If your current hardware configuration is allowed in the new size
8. **What are the typical disks configured for Azure Virtual Machines?:** C:\ As the OS disk
D:\ As the Temporary Disk
9. **What should not be stored on the D:\ Drive?:** Dont store data that is critical to the system on this drive. It is not typically destroyed on reboot but is not preserved on all actions with the VM
10. **What are Data disks in azure vm?:** Disks that are attached to a virtual machine with data you need to keep. The limit of disks attached to the vm is determined by the size of it.
11. **What is an unmanaged disk?:** You manage the storage accounts that you use to store the virtual hard disk (VHD) files that correspond to your VM disks. Stored as page blobs
12. **What is a managed disk?:** A Virtual hard disk (VHD) that is an abstraction over page blobs, blob containers, and azure storage accounts.
13. **What is required for the single instance virtual machine SLA (99.95%): -** Managed disks
14. **How do you access your virtual machines?:** Windows based VMs can be connected to through RDP. Linux based clients use SSH, Putty for Instance. Bastion connections, Allows you to connect from inside your VNet without provisioning your VM with a public IP address, No agent, client, or software is needed.
15. **What port is used for RDP traffic?:** TCP port 3389
16. **How do you establish a command line session to an Azure VM?:** Windows Remote Management (WinRM) By default it uses TCP port 5986

17. **Whats a secure way of connecting to a linux VM?:** SSH connections authenticating with password or more securely with SSH keys
18. **What are three scenarios that can lead to your virtual machines in Azure being impacted?:** Unplanned Hardware Maintenance, Unexpected Downtime, Planned Maintenance
19. **What is Unplanned Hardware Maintenance?:** Occurs when the azure platform predicts that the hardware or any platform component associated with a physical machine is about to fail. When predicted an event is issued and live migration is used to migrate the VM to a healthy physical machine.
20. **What is Unexpected Downtime:** When the hardware or physical infrastructure for the virtual machine fails unexpectedly. When detected, the azure platform automatically migrates your virtual machine to a healthy machine in the same datacenter
21. **What is planned maintenance?:** Periodic updates made by microsoft to the underlying Azure platform to improve overall reliability, performance, and security of the platform. typically performed without any impact upon your virtual machines or cloud services.
22. **What is an Availability Set?:** A logical feature used to ensure that a group of related VMs are deployed so that they aren't all subject to a single point of failure. Azure ensures that VMs you place within an availability set run across multiple servers, compute racks, storage unites, and network switches.
23. **What are the principles of reliable cloud solutions:** For redundancy, configure multiple virtual machines in an availability Set. Configure each application tier into separate availability sets. Combine a load balancer with availability sets. Use managed disks with the virtual machines.
24. **What is an Update Domain (UD)?:** a group of nodes that are upgaded together during a service upgrade (rollout). This lets azure perform incremental upgrades across a deployment
25. **What is a fault domain (FD)?:** A group of nodes that represent a physical unit of failure. Defines a group of virtual machines that share a common set of hardware, switches, that share a single point of failure.
26. **What are Availability Zones?:** A high-availability offering that protects your applications and data from datacenter failures.
27. **What are the two categories of azure services that support availability zones?:** Zonal Services (Pins the resource to a specific zone) and Zone-redundant services (Platform replicates automatically across zones)
28. **What is vertical scaling?:** Scale up, Scale down, changing the virtual machine sizes in response to a workload.
29. **What is horizontal scaling?:** Scale out, Scale in, The number of VMs is altered depending on the worload.

30. **What are virtual machine scale sets?:** An Azure compute resource you can use to deploy and manage a set of identical VMs
31. **What is Autoscale?:** A setting for scale sets to automatically increase or decrease the number of VM instances that run your application.
32. **What's a Virtual machine extension?:** Small applications that provide post-deployment configuration and automation tasks on Azure VMs.
33. **What are custom script extensions?:** PowerShell scripts you develop and install to a virtual machine to perform specific configurations on the device.
34. **What is Desired State Configuration?:** A management platform in PowerShell, that allows you to deploy and manage configuration data for software services and manages the environment in which they run. The script consists off of a Configuration block, Node block, and one or more resource blocks.
35. **What is an App service plan?:** Defines a set of compute resources for a web app to run. Not included in the server farm like conventional web hosting.
36. **Can you share an app service plan with multiple apps?:** Yes, it will include the region, number of vm instances, and the vm size
37. **How do you scale an app in Azure App Service?:** It starts at the app service plan, can be configured to autoscale or run on provisioned instances.
38. **What are the App Service Plan price tiers?:** Free, Shared, Basic, Standard, Premium, and Isolated
39. **What does the free and shared App Service Plan tier entail?:** Runs on the same Azure VM as other apps. Some apps may belong to other customers. Intended for development and testing only, there is no SLA and are metered on a per app basis.
40. **What does the Basic App Service Plan tier entail?:** For apps that have lower traffic requirements, and don't need autoscale and traffic management features. Pricing is based on the size and number of instances you run. Built in network load balancing support automatically distributes traffic across instances. Linux runtime environments supports Web App for Containers
41. **What does the Standard App Service Plan tier entail?:** Designed for running production workloads. Based on size and number of instances, built in network load balancing, auto scale to match your traffic, can use Linux runtime environments that supports Web App for Containers
key difference, autoscale is an option vs basic
42. **What does the Premium App Service Plan tier entail?:** Designed for enhanced performance for production apps. Premium v2 features faster processors, ssds and double memory to core ratio vs standard. supports higher scale via increased instance count.

43. **What does the Isolated App Service Plan tier entail?:** Designed to run mission critical workloads that need to be ran in a virtual network. Allows customers to run their apps in a private dedicated environment with Dv2 series VMs, the environment is aclled the App Service Environment. Can scale to 100 instances with more available upon request.
44. **What is Scale Up?:** Get more CPU, memory, disk space, and extra features like dedicated virtual machines, custom domains and certificates, staging slots, autoscaling, and more. You scale up by changing the pricing tier of the app service plan your app belongs to.
45. **What is Scale Out?:** Increase the number of VM instances that run your app. You can scale out to as many as 30 instances depending on your pricing tier. Isolated tier lets you scale out even further to 100 instances. Can be set to manually scale or autoscale.
46. **How do you Autoscale an App?:** A setting is read by the autoscale engine to determine whether to scale up or down. can be metric based or time based. For instance with metric based, it can be based off of your resources. With time based, it can be set to autoscale at a certain time.
47. **How do you create an App service?:** You need to specify a resource group and a service plan along with some other information.
Name - that's unique and can be used to locate your app.
Publish - with code or a Docker Container
Runtime stack - the software stack that runs the app, including the language and SDK versions.
Operating System - Linux or Windows
Region - for availability purpose
48. **What are additional configuration settings you can use for an app?:** Always on - Keep the app loaded even when there is no traffic.
ARR affinity - In a multi-instance deployment, ensure the client is routed to the same instance for the life of the session
Connection strings - Encrypted at rest and transmitted over an encrypted channel
49. **What is continuous integration and deployment?:** An element of Devops, you define your own build and release process that compiles our source code, runs the tests, builds a release, and finally deploys the release into your web app every time you commit the code. You can use GitHub, Bitbucket, and Azure Devops to create an automated deployment solution, this is Continuous integration. You can also deploy this manually
50. **What is a deployment slot?:** A live app with their own host names, you can create separate slots when your running standard, premium, or isolated app service plan tier.

51. **Why would you use Deployment slots?:** You can validate app changes in a staging deployment slot before swapping it with the production slot. Deploying it into a slot and swapping it into production ensures that all instances of the slot are warmed up before being swapped into production and can be done automatically. If the swap did not go as expected, you can swap back immediately to get your "last known good site" back.
52. **What are the three categories of Deployment Slot settings?:** Slot-Specific app settings and connection strings. Continuous deployment settings, if enabled. App service authentication settings, if enabled.
53. **How do you provide security for Azure app Service?:** Built in support for authentication and authorization, so you can sign in users and access data with minimal or no code in your web app, api, and mobile back end, and also Azure Functions. It runs in the same sandbox as your application code. When enabled, every incoming http request passes through it before being handled by your application code.
54. **What are the two options to configure security for your app service?:** Allow Anonymous requests - defers authorization of unauthenticated traffic to your application code
Allow only authenticated requests - Redirects all anonymous requests for the provider you choose.
55. **Whats the easiest way to set up a custom domain?:** Buy it directly in the azure portal, you can manage your domain name directly in the portal instead of a third party site.
56. **What records are in DNS to map domain names into IP addresses?:** A (Address) records map a domain name to an IP address
A CNAME (Canonical Name) record maps a domain name to another domain name. Users still see your first domain name in their browser, you can map contoso.com to yourwebapp.azurewebsites.net for instance.
57. **What is a pre requisite of adding a custom DNS name to your web app?: -** The web app's App Service plan must be a paid tier.
58. **What is Backup and Restore in Azure App Service?:** lets you create app backups manually or on a schedule, you configure how long the backups are retained, you can restore the app to a snapshot of a previous state. Can back up App configuration, file content, and databases connected to your app.
59. **What tier allows you access to backup and restore?:** The standard tier or premium tier.
60. **What are application insights?:** A feature of azure monitor, monitors your live applications. It detects performance anomalies and includes analytics tools to help

you diagnose issues and understand user actions in your app. Can be included in a CI CD pipeline

61. **What are containers?:** Operating system virtualization that allows you to run multiple applications within the same instance of an operating system, each application is isolated from the other. Its lightweight, mobile, and offers great fault tolerance due to it being easy to rebuild from scratch automatically.
62. **What does Azure offer for containers?:** Azure Container Instances
63. **What are Azure Container groups?:** The top-level resource in azure container instances. A collection of containers that get scheduled on the same host machine.
64. **How do you deploy a container group?:** Use a Resource manager template (ARM template) or a YAML file. If your deployment only consists of container instances, its recommended to use a YAML file. If you are deploying additional Azure service resources like azure file share, its recommended to use an ARM template.
65. **How are resources used by a Azure Container Group?:** The resources are requested by containers and are then added to the group as an allocation.
66. **How does networking work in a Azure container group?:** They share an external-facing IP address, one or more ports on that IP address, and a DNS label with an FQDN.
67. **What is Docker?:** A platform that enables developers to host applications within a container.
68. **What is the guarantee with docker?:** The guarantee that the containerized software will always run the same, no matter the OS or location.
69. **What is a container image in docker?:** A package with all the dependencies and information required to create a container, an image is immutable once it has been created.
70. **What is a Dockerfile:** Refers to a text file that contains instructions on how to build a docker image, like a batch script.
71. **What is the AKS terminology to know?:** Pool, Nodes, Pods, Container, Deployment, Manifest
72. **What is a Pool?:** groups of nodes with identical configurations
73. **What is a node?:** individual virtual machines running containerized applications
74. **What is a pod?:** a single instance of an application, A pod can contain multiple containers
75. **What is a container?:** A lightweight and portable executable image that contains software and all of its dependencies
76. **What is a deployment:** One or more identical pods managed by kubernetes
77. **What is a manifest?:** the YAML file describing a deployment

78. **What is the kublet?:** The kubernetes agent that processes the orchestration request from the azure-managed node, and scheduling of running the requested containers.
79. **What is the kube-proxy?:** On each node that routes network traffic and manages IP addressing for services and pods.
80. **What is the container runtime?:** the component that allows containerized applications to run and interact with additional resources. AKS clusterers using v1.19 for node pools use MOBY (upstream docker)
81. **What are the service types that kubernetes uses to logically group a set of pods together?:** Cluster IP, NodePort, LoadBalancer, ExternalName
82. **What is the Cluster IP service?:** An internal IP address to use within the AKS cluster, good for internal only applications
83. **What is the NodePort service?:** A port mapping on the underlying node that allows the application to be access directly with the NodeIP address and port
84. **What is the kubernetes load balancer service?:** An azure load balancer resource configured with an external IP address and connects the requested pods to the load balancer backend pool. to allow customers traffic to reach the application, load balancing rules are created on the desired ports.
85. **What is the ExternalName service?:** A specific DNS entry for easy application access.
86. **What does Kubernetes Scheduler do?:** It takes defined resource limits to request a certain amount of CPU or Memory resources on a node to meet a request for a Pod
87. **How is a Pod Ephemeral?:** Its a disposable resource that can be rebuilt vs recovered
88. **What is a AKS volume?:** A way to store, retrieve, and persist data across pods and through the application lifecycle
89. **How are Azure Disks used with Kubernetes?:** Used to create Kubernetes DataDisks, can use premium storage or standard. Mounted as ReadWrite once, so are only available to a single node.
90. **How are Azure Files used with Kubernetes?:** Used to mount an SMB3.0 share backend by azure storage to pods, lets you share across multiple nodes and pods, you can use premium or standard storage.
91. **What are PersistentVolumes (KV) in kubernetes?:** Storage that can exist beyond the lifetime of an individual pod, can be created with azure disks or files. Can be statically created by the cluster administrator, or dynamically created by the kubernetes API server.

92. **What are storage classes in kubernetes?:** They define different tiers of storage and reclaimPolicy. reclaimPolicy controls the behavior of the underlying azure resource when the pod is deleted and the volume may no longer be required.
93. **What is the default storage class in AKS?:** Uses Azure StandardSSD storage to create a managed disk, the reclaim policy ensures that the underlying disk is deleted when the persistent volume that used it is deleted
94. **What is the managed-premium storage class in AKS?:** Uses azure premium to create a managed disk, the reclaim policy ensures that the underlying azure disk is deleted when the persistent volume is deleted.
95. **What is the azurefile storage class in AKS?:** Creates Azure file shares with standard storage, ensures ensures that the underlying azure files is deleted when the persistent volume is deleted.
96. **What is azurefile-premium storage class in AKS?:** Creates Azure file shares with premium storage, ensures ensures that the underlying azure files is deleted when the persistent volume is deleted.
97. **What are persistent volume claims in AKS?:** The request for storage resources
98. **How do you scale in AKS?:** Manually scaling, horozontal pod autoscaler or cluster autoscaler
99. **How do you manually scale in AKS?:** You define the replica or node count, and the Kubernetes API schedules creating new pods or draining nodes.
100. **What is (HPA) Horizontal pod autoscaler in kubernetes?:** Monitors the resource demand and automatically scale the number of replicas, checks every 30 seconds by default and when changes are required, the number of replicas is increased or decreased accordingly. You define the minimum and maximum number of replicas that can run, you can define the metric to base scaling decisions on also, like cpu usage.
101. **What is cooldown of scaling events in AKS?:** The wait period for HPA to run after the scale event or before another scale event can be triggered, the default delay on scale up is 3 minutes and the delay on scale down is 5 minutes, reduce the --horizontal-pod-autoscaler-upscale-delay to scale up faster using kubectl
102. **What is cluster autoscaler? in AKS:** Adjusts the number of nodes based on the requested compute resources in the node pool, by default it checks every 10 seconds for required changes. If it is required it increases or decreases the number of nodes accordingly, works with RBAC-enabled AKS clusters that run kubernetes 1.10.x or higher, if pods need more resources but the node is out, it deploys more nodes into the pool, when a node isnt needed for more than 10 minutes it schedules itself for deletion

103. **How do you rapidly scale in AKS?:** Integrate Azure Container instances, when deployed its a secure logical extension of your AKS cluster, kubernetes then can schedle pods to run as ACI instances because it views ACI as a node. ACI then uses virtual nodes to run the request.
104. **What resources are needed to have an Azure VM?:** A virtual machine that provides CPU and memory resources
An azure storage account to hold the virtual hard disks
Virtual disks to hold the OS, Applications, and data
Virtual network to connect the VM to other azure services
A network interface to communicate with the VNet
Optionally a public IP address so you can access the VM
105. **What is Azure Automation State Configuration?:** Used to keep VMs in a cluster in a consistent state, with the same software installed and the same configuration.
106. **What is Powershell DSC (desired state configuration)?:** A declarative management platform that azure automation station configuration uses to configure, deploy, and control systems. A declarative programming language separates intent (what you want to do) from execution (how you want to do it).
107. **What is LCM (local configuration manager)?:** A component that is responsible for updating the state of a node, like a vm, to match a desired state.
108. **What is a push architecture?:** An administrator manually sends or pushes the configuration to one or more nodes?
109. **What is a pull architecture?:** A pull server holds the configuration information, the LCM on each node polls the pull server at regular intervals (default is 15 minutes) then gets the latest configuration details.
110. **What does the Configuration syntax in DSC do?:** Starts with the configuration keyword and you provide a name, then it describes the desired configuration with a script block.
111. **What does the node syntax in DSC do?:** Determines the names of the .mof files that are generated when you compile a configuration. use the array notation to target multiple hosts
112. **What does the resource syntax in DSC do?:** Blocks that can specify the resources to configure, like the 'windows feature' resource.
113. **What is a configuration Data block?:** a named block that contains an array of nodes, the array must me named AllNodes and the data for the node must be specified with the NodeName variable
114. **How do you secure credentials in a DSC script?:** You should avoid putting them in plaintext and instead store them as a PSCredential Object. They aren't

encrypted in .mof files by default but can be encrypted using a certificate in your configuration data.

115. **How do you push a configuration to a node?:** You create a compiled .mof file for a configuration and push it by running the Start-DscConfiguration cmdlet. you can add the path of a directory and it applies any .mof file it finds in that directory to the node.

116. **How do you pull a configuration to a node?:** You create a DSC script, create a azure automation account, upload the DSC script, Add the required modules, compile the configuration and register the virtual machine. After 15 minutes the LCM on the VM polls azure automation for any changes to the DSC configuration file. Credentials are handled natively by your automation account.