**Questions – Level 1**

**Introduction to Microsoft Azure**

**Cloud computing** is a model for enabling convenient, **on-demand network access** to a **shared pool of configurable computing resources** (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction.

**Yes**/No

\*\*\*\*\*\*\*\*\*\*\*\*

The main characteristics of cloud computing are:

1. On-Demand Self-Service
2. Broad Network Access
3. Rapid Elasticity
4. Measured Service
5. Resource Pooling
6. All answers are correct

\*\*\*\*\*\*\*\*\*\*\*\*

**Hybrid cloud** is basically a cloud environment which combines multiple private cloud environments.

Yes/**No** (Hybrid cloud is a cloud computing environment that uses a mix of on-premises, private cloud and third-party, public cloud services)

\*\*\*\*\*\*\*\*\*\*\*\*

When using PaaS, the end-users/customers have more control over the underline IT resources compared to IaaS.

Yes/**No**

\*\*\*\*\*\*\*\*\*\*\*\*

**Azure Infrastructure as a Service (IaaS) is divided into the following main categories:**

1. Compute, Virtual Machines, Containers
2. Storage, Virtual Network, Files
3. IaaS, PaaS, SaaS
4. **Compute, Storage, Networking**

\*\*\*\*\*\*\*\*\*\*\*\*

Azure is based on multiple data centers located in multiple places around the world. At the lowest level, we have the datacenters. Those data centers are grouped under something that is called **availability zones.** Availability Zones are a group of physically separate locations within an Azure region. Each Availability Zone is made up of one or more data centers equipped with independent power, cooling, and networking. It is a protection from datacenter failure**.**

**Yes**/No

\*\*\*\*\*\*\*\*\*\*\*\*

**A region** is a group of availability zones or a group of data centers that are located in a single geographical area. All datacenters under the same region are connected with a super fast dedicated regional network for providing low-latency network connection.

**Yes**/No

\*\*\*\*\*\*\*\*\*\*\*\*

In Azure, almost anything is a resource. It is a manageable item that is available through Azure. For example, a resource can be a VM, database, virtual network, network interface, public IP address, storage account and much more.

**Yes**/No

\*\*\*\*\*\*\*\*\*\*\*\*

A resource group is like a container that groups related resources for a particular management reason. Users are responsible to create resource groups and decide how they want to group the actual resources. When we create a resource it must be allocated under a single resource group.

**Yes**/No

\*\*\*\*\*\*\*\*\*\*\*\*

**Azure Resource Manager (ARM)** provides the following options to connect, automate, and interact with it:

1. Azure Web Portal
2. PowerShell
3. Azure Command Line Interface (CLI)
4. Azure REST APIs
5. All answers are correct

\*\*\*\*\*\*\*\*\*\*\*\*

The first step before using the Azure platform, we need to create an Azure account. This is like a globally unique entity enabling to access Azure services. Inside an Azure account, we can create a single or multiple **Azure subscriptions**. An Azure subscription is a connection between allocated resources to the billing side.

**Yes**/No

\*\*\*\*\*\*\*\*\*\*\*\*

A *role assignment* is the process of binding or creating a role definition to a user, group, or service principal at a particular scope for the purpose of granting access.

**Yes**/No

**Azure IaaS – Networking**

A virtual network is basically a private isolated connectivity layer being used to connect between a group of cloud resources. A cloud resource is connected to the virtual network via a virtual network interface.

**Yes**/No

\*\*\*\*\*\*\*\*\*\*\*\*

Splitting a network into small pieces is a common practice in networking to improve performance and security. It is called **sub-netting**. We basically take a larger address space and break it into smaller address spaces. An address space of one subnet can overlap with another subnet under the same virtual network.

Yes/**No** (The address range of specific subnet cannot overlap with other subnets in the same virtual network)

\*\*\*\*\*\*\*\*\*\*\*\*

Using dynamic private IP allocation the Azure cloud network will assign the next available unassigned or unreserved IP address in the subnet's address range using DHCP service. This IP address can change when we stop and start a VM.

**Yes**/No

\*\*\*\*\*\*\*\*\*\*\*\*

An IP configuration is associated with a specific network interface and the network interface is associated with specific cloud resource, such as VM.

**Yes**/No

\*\*\*\*\*\*\*\*\*\*\*\*

A **public IP** is used for the following communication option:

1. Outbound communication of internal resources with the outside Internet.
2. Resources located outside the Internet will be able to access resources inside Azure.
3. Answers 1 and 2

\*\*\*\*\*\*\*\*\*\*\*\*

In Azure, a public IP is not a resource. This public IP can be assigned dynamically or statically.

Yes/**No** (In Azure, a public IP is a resource, an entity with its own properties)

\*\*\*\*\*\*\*\*\*\*\*\*

For outbound communication, we basically don’t need to configure a public IP on the network interface level. When a VM initiates an outbound flow to a destination in the public IP address space, Azure dynamically maps the private IP address to a public IP address.

**Yes**/No

\*\*\*\*\*\*\*\*\*\*\*\*

A VM must be attached to at least one network interface. Each network interface can be configured with a private address and also an optional public IP address. This configuration is encapsulated under something that is called IP configuration profiles. Each network interface is assigned with one primary IP configuration and may have zero or more secondary IP configurations assigned to it.

**Yes**/No

\*\*\*\*\*\*\*\*\*\*\*\*

We can filter network traffic inbound to and outbound from a virtual network or a virtual network subnet using a configuration that is called **network security group**. A Network security group contains a group of security rules that filter network traffic. It is a layer of security that acts as a virtual firewall for controlling traffic in and out.

**Yes/**No

\*\*\*\*\*\*\*\*\*\*\*\*

A network security group can be enforced only on a virtual network or subnet levels.

Yes/**No** (The network security group can be enforced in different levels. We can configure network security group on a virtual network, a subnet and also on a specific network interface).

\*\*\*\*\*\*\*\*\*\*\*\*

Security rules are divided into two main categories: inbound security rules and outbound security rules.

**Yes**/No

\*\*\*\*\*\*\*\*\*\*\*\*

Application security groups can be used to replace network security groups. The focus is moving to the function of the applications. We can group VMs based on their function.

Yes/**No (**ASG is not replacing NSG. It is actually simplifying the rules we create inside the NSG.)

**Azure IaaS – Storage**

Object storage is designed for handling unstructured data and to fulfill the requirements for storing a growing amount of data in the context of scalability. In object storage, data is organized as flexible entities called “objects”. Per each object, we will have the data itself, a variable amount of metadata, and a globally unique identifier.

**Yes**/No

\*\*\*\*\*\*\*\*\*\*\*\*

The capability to combine data and dynamic meta-data is a key advantage in block storage.

Yes/**No (**The capability to combine data and dynamic meta-data is a key advantage in object storage).

\*\*\*\*\*\*\*\*\*\*\*\*

All data access in Azure Storage happens through an entity called **storage account**. Inside a storage account, we can create containers or also called “buckets”. A container is used to organize a set of objects or also called blobs, similar to the way we are using folders in a file system.

**Yes**/No

\*\*\*\*\*\*\*\*\*\*\*\*

Object Storage is best suitable for frequently data changes and high throughput.

Yes,/**No** (Object Storage is unsuitable for frequently data changes and provides slower throughput compared to other storage options.

\*\*\*\*\*\*\*\*\*\*\*\*

An Azure storage account provides the following main advantages:

1. A unique namespace in the cloud to store and access our data objects. All storage resources can be accessed via the internet using URLs.
2. Grouping several allocated storage resources with similar properties or attributes.
3. Access, monitor, track costs and troubleshoot issues on the storage account level.
4. **All answers are corrected**

\*\*\*\*\*\*\*\*\*\*\*\*

Azure provides us with several storage replication options to be selected on the storage account level. When we create a new storage account we have the flexibility to define the needed data replication. All storage resources under that storage account will be protected according to that selection.

**Yes**/No

\*\*\*\*\*\*\*\*\*\*\*\*

**Managed Disks** handles the storage account creation/management automatically so we don’t have to worry about the scalability limits of the storage account. We simply specify the disk size and the performance tier (Standard/Premium), and Azure creates and manages the disk for us.

**Yes**/No

\*\*\*\*\*\*\*\*\*\*\*\*

**Azure Storage Service Encryption** is enabled by default for encrypting anything we store in Azure storage. This is server-side encryption based on service managed keys so the process is completely transparent to users. It is using the 256-bit Advanced Encryption Standard (AES) encryption. All data within the Storage Account (blob, queue, table, and files) are encrypted and it is managed at the storage account level.

**Yes**/No

**Azure IaaS – Compute**

\*\*\*\*\*\*\*\*\*\*\*\*

Which of the following resources are required when creating a new VM with managed disks?

1. **Resource Group, Virtual Network, Network Interface**
2. Data Disks
3. Storage Account
4. Answers 1,2
5. Answers 1,3

\*\*\*\*\*\*\*\*\*\*\*\*

Which of the following resources are optional when creating a new VM with managed disks?

1. Virtual Network
2. Data Disks
3. Public IP Address
4. **Answers 2 and 3**

\*\*\*\*\*\*\*\*\*\*\*\*

While creating a new VM we need to select an image. This image is basically the base operating system or application. As part of the Azure marketplace, there are a variety of off-the-shelf images with a variety of operating systems and applications. In addition, we can also use our own customized image.

**Yes**/No

\*\*\*\*\*\*\*\*\*\*\*\*

Microsoft Azure provides us with a variety of VM types and sizes that will be more optimized to the resources consumption profile of our application. VM types are grouped into categories. A specific **group type** is supposed to handle specific applications much for effectively. For example, the “Memory optimized” group can be used for relational database servers as memory is a great factor for such applications.

**Yes**/No

\*\*\*\*\*\*\*\*\*\*\*\*

Using the Azure portal, we can’t scale up or down an existing VM.

Yes/**No**

\*\*\*\*\*\*\*\*\*\*\*\*

Azure virtual machine (VM) extensions are small applications that provide post-deployment configuration and automation tasks on Azure VMs. The Azure platform hosts many extensions that range from VM configuration, monitoring, security, and utility applications.

**Yes**/No

\*\*\*\*\*\*\*\*\*\*\*\*

When we stop a running VM and it is deallocated from the underline host, the virtual disks attached to that VM will be are also deleted.

Yes/**No**