

**Mid Semester Assignment (Spring- 2020)**  
**Cloud Computing**

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Time: 6 days

Total Marks: 30

Instructor: M Omer Rauf

**Note: Attempt all Questions. Answers should be in your own words. Plagiarism will not be tolerated, if detected, it will lead to failure.**

**Question No. 1:** (10)

- a. Explain essential characteristics of cloud computing.
- b. Explain in detail the key properties of cloud computing.

**Question No. 2:** (10)

- a. Explain in detail different service models of cloud computing.
- b. Explain in detail different deployment models of cloud computing.

**Question No. 3:** (10)

- a. Explain in detail roles and boundaries in cloud.
- b. Explain in detail cloud risk and challenges.

**Ans 1 a)** Following are the characteristics of cloud computing:

- Resources can be changed or expanded depending on their use. It analyzes memory usage and allows the user to release or increase the allocated resources.
- Independently, users can access resources across multiple platforms over the Internet where and when.
- The resources provided by the cloud are secure and only an authorized person can access.
- Cloud resources are distributed among multiple users, with data being retained by every safe user. It is the same as for multiple clients that use the same architecture of an Apartment while respecting everyone's privacy.
- Cloud computing enables its users to flexibly provide services on any device and Pay only for the resources you need when you need them.

**Ans 1 b)** Following are the key properties of Cloud Computing:

1. **Programmable:** In cloud computing, processes are automated, such as backing up failed data with duplicates.
2. **Powerful:** The processing and storage power of cloud computing is more important than a single desktop computer.
3. **Multiple-Tenancy:** This is data sharing between multiple users. Because all kinds of data are stored in the cloud, it is necessary to mine and analyze data to get information intelligently.
4. **Self-Healing:** As backups are available for every document in the cloud. In case any document crashes there will be its duplicate ready to run.
5. **Measured usage:** The ability of the cloud platform with which the cloud provider receives from the cloud user to monitor the actual use of their IT resources by each cloud user.

**Ans 2 a)** The cloud service model represents a combination of the IT resources offered by the cloud service provider. These three common models are available.

- **Infrastructure-as-a-Service (IaaS):**  
A cloud service where infrastructure is offered as a service. IaaS provides access to resources such as virtual machines or virtual storage, etc.
- **Platform-as-a-Service (PaaS):**  
A cloud service where the platform is offered as a service. PaaS provides services that anyone can use to create and deliver entire web applications.
- **Software-as-a-Service (SaaS):**  
A cloud where software is offered as a service. SaaS provides web software as a service where the user can use the services of the provider.

**Ans 2 b)** By deployment model, we mean that the services offered by the service providers can be of several types which are:

- a) **Public Cloud:** The deployment model of cloud services where everyone from the general public is eligible to use the services offered by the cloud.
- b) **Private Cloud:** Cloud services deployment model where only the selected person can access the services provided by the cloud.
- c) **Community Cloud:** Cloud service deployment model where community members can use and access cloud services.
- d) **Hybrid Cloud:** The deployment model of cloud services where the mixture of public and private clouds both comes into being, as certain critical activities are performed privately and non-critical ones are performed publicly.

**Ans 3 a)** Following are some of the roles and boundaries of a cloud:

- **Cloud Provider:** A company or organization that provides cloud-based IT resources as a service.
- **Cloud Customer:** An organization or individual that uses the services provided by the organization.
- **Cloud Service Owner:** An organization or an individual that owns the cloud.
- **Cloud Resources Administration:** The individual or an organization who is responsible for administering cloud resources provided by the cloud.
- **Organizational boundary:** The physical realm that surrounds a collection of IT resources owned and managed by an organization.
- **Trust boundary:** A logical sphere that is usually represented beyond physical boundaries to the extent that IT resources are reliable.

**Ans 3 b)** Following are some of the Challenges and Risks in Cloud Computing:

- **Cloud Migration:** It is the process of transferring an organization's data, applications and other important information from its premises to the cloud infrastructure. Migration to the cloud allows access to all the IT capabilities already felt through the devices installed on the site
- **Incompatibility:**  
When shifting workloads from local to cloud, the common problem is the incompatibility between on-premises infrastructure and the services that companies will purchase from public cloud providers.
- **Data security:**  
CSP (Cloud Service Provider) are responsible for providing clouds' security, but they're not sure about securing for your apps, servers, and security of data.

- **Lack of expertise:**

With the rapid advancement and improvement in cloud technologies, more and more organizations are clouded to keep their workload. Organizations can meet this challenge by providing cloud technology training to their system administrators and staff.

- **Downtime:**

Businesses want full data access and availability whenever their data is stored in the cloud anytime, anywhere. The real challenge for most organizations is that they can access their data from the cloud with an Internet connection.

- **Bandwidth Cost:**

Although organizations and businesses can save money on hardware by using the cloud, they have to pay extra for the bandwidth used to access their workload.