

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

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Semester: 8th **(Section-A)**

Date: 13, April, 2020

Time: 6 days

Total Marks: 30

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**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.**

Answer: Basically, cloud computing is divided into two main categories.

**1- Cloud Computing 1.0 (Traditional)**

**2- Cloud Native Computing 2.0 (Advance Cloud used now a days)**

Now we will explain the essential characteristics of Cloud Computing as asked in the question. Cloud computing 1.0 works on monolithic architecture and some of the key features are given as under.

**1- Pooling of Resources:**

It has the capability of pooling of resources with the help of multi-tenant system which assigns different resources such as physical and virtual as per demand of the user.

**2- Self Service or On Demand Self Service:**

If user want to continuously monitor the up and down time of the server with respect to his needs. And also wants to keep a track of the storage capabilities on the network.

**3- Low Down Time:**

Cloud servers has very low-down time and in some cases, it is almost null. Because it provides its services by 24/7.

**4- Network Access:**

With this technology we can access these resources anywhere in the world and have access to download and upload any time.

**5- Large Storage and Availability:**

The cloud is available all over the world any time and user can have the option to increase the storage space as per his needs. And buy for more.

Some other key features of the Cloud Computing is given as.

**6- Secure System:**

**7- Automatic System:**

**8- Economical System:**

9- Pay as per Need of Resources:

**b. Explain in detail the key properties of cloud computing.**

The key properties of cloud computing are mentioned as under.

**1- User Centric:**

Here user centric means that this system works on Peer to Peer network. (P2P network)

**2- Task Centric:**

The system is working on task base for each task have different service.

**3- Powerful:**

The Cloud system is powerful enough to handle any kind of processing and complex task in terms of storage, processing, sharing etc.

**4- Intelligent:**

The cloud computing keeps a track of each and every service individually and working on the basis of Artificial Intelligence and Machine Learning.

**5- Accessible:**

Cloud Computing have the advantage of accessibility of 24/7, from anywhere in the world with the help of an internet.

**6- Programable:**

Here programable means that the Cloud Computing Infrastructure is easy to Program. The early version of cloud has some complexities whereas the current system can be modified very easily.

**7- Distributed:**

All the tasks of Cloud Computing are distributed according to the user needs for the sack of security and responsiveness.

**8- Collaborative:**

Cloud Computing can also be known as collaborative computing. With the help of this feature many complex tasks can be performed very easily.

**Question No. 2:**

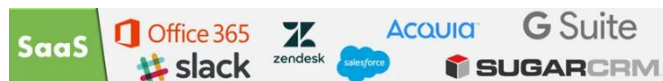
**10**

**a. Explain in detail different service models of cloud computing.**

**1- SaaS (Software as a Service):**

In this paradigm the software facility is provided to the users for use. These software's are running on the remote servers. Some common examples of the SaaS are given below.

Examples:



## 2- FaaS (Function as a Service)

The concept behind this is the providence of a computing technique in which the computational complexities are hidden on a remote server and the developers start their task in few seconds. Here the developer or a can work on a “Function” or piece of code or business logic. Which start the logic and after computation task is completed and finishes all the work. And at last cleans the environment.



## 3- DaaS (Data as a Service)

In the Data as a Service architecture the advance form of STaaS is used. In which data is make available on the cloud with the help of containers, objects and databases. This data is provided to the user on demand through cloud services.



## 4- PaaS (Platform as a Service)

Platform as a Service means that the cloud provides Operating environments and different software as a service for development and agile development.



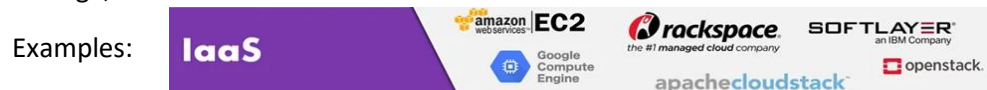
## 5- STaaS (Storage as a Service)

This technique works on the web-based API that helps the companies to store their data and files remotely on cloud. If the client or companies’ losses their copy of data then they can request the administrator to provide a copy of data.



## 6- IaaS (Infrastructure as a Service)

In this service the Virtualization technique is used for the cloud computing. It contains the virtualized computing components ie. Virtual memory, virtual CPU, Virtual Storage, and Virtual Network Access.



b. Explain in detail different deployment models of cloud

There are four types Cloud deployment models which are discussed in details in the upcoming lines.

**1- Private Cloud:**

This type of data center is very popular for the supplies of hosted services to a limited number of people.

Some basic features of Private cloud are

- a- Privately Shared Virtualized Resources
- b- Cluster of Dedicated Customers
- c- Connectivity over the internet, Fiber or Private Network
- d- Suited for secure confidential Information and Core Systems.

**2- Public Cloud:**

These services are offered to anyone on the internet. Some key features of Public Cloud are.

- a- Publicly shared virtualized resources.
- b- Supports multiple customers.
- c- Supports internet Connectivity.
- d- Suited for less confidential information.

**3- Hybrid Cloud:**

It is needed when private cloud is out of capacity.

**4- Community Cloud:**

It is a type of cloud on which an infrastructure has been shared different kind of organizations.

**Question No. 3:**

**10**

**a. Explain in detail roles and boundaries in cloud.**

The detail explanation of roles and boundaries in the cloud is given in the following lines.

**1- Cloud Provider:**

Cloud Provider may be defined as the organization which provides and facilitates in the cloud-based Information Technology services is called as Cloud Providers.

Normally a company that provides these types of services owns the IT resources and provides it on lease to the consumers and clients.

**2- Cloud Consumer:**

On the other hand, a cloud consumer is a person or an organization which sign a contract with the cloud provider for the use of IT resources.

**3- Cloud Service Owner:**

The ownership of a person or a company on legal basis for a service of a cloud is called as Cloud Service Owner.

**4- Cloud Resource Administrator:**

A person or an organization which is responsible for the overall administration of cloud-based IT Resources and services.

**5- Organizational Boundary:**

The physical location where the equipment's and IT resources are present physically in a geographical location and owned and governed by an organization is called as Organizational Boundary.

**6- Trust Boundary:**

It is the logical perimeter which is beyond the physical parameter and covers the a broad spectrum of IT Resources and services and define a trust on that normally relates to the cloud consumer.

Some supplementary roles which are defined by the NIST architecture are given as.

- 1- Cloud Auditor
- 2- Cloud Broker
- 3- Cloud Carrier

**b. Explain in detail cloud risk and challenges.**

Some of the main risks and issues that are faced by cloud computing are.

- 1- Security
- 2- Containment and Cost Management
- 3- Lack of expertise and resources
- 4- Control and Governance Issues
- 5- Compliance Issues
- 6- Multiple Cloud Management Issues
- 7- Cloud Performance Issues
- 8- Constructing a Private Cloud Issues
- 9- Adoption and Segmented Usage of the Cloud Issues
- 10- Cloud Migration Issues.