Nirma University

Institute of Technology

Semester End Examination (IR), May 2022

B.Tech in Computer Science & Engineering, Semester: VI

2CSDE67: Cloud Computing

Roll/ Exam No | | Supervisor's initial with date | |

Time : 3 Hours | Max Marks: 100

Instructions:
1. Attempt all questions.
2. Figures to right indicate full marks.
3. Use section-wise separate answer book.
4. Draw neat sketches wherever necessary.

SECTION-I

Q-1 Answer the following **[20]**

A CLO-1 Live migration refers to the process of moving a running virtual machine or application between different physical machines without disconnecting the client or application. Memory, storage, and network connectivity of the virtual machine are transferred from the original guest machine to the destination. Along with its architecture, mention the steps associated with the live migration process of the VM from one host to another. (10)

B CLO-3 What are uptime and downtime in Cloud Computing? Mention any two techniques through which the Cloud Service Provider will be able to reduce the downtime in the dynamic Cloud environment. (5)

C CLO-4 Before choosing a *Cloud Computing Platform* what are the essential things to be taken into concern by the users? Mention any five points for the same. (5)

Q-2 Do as directed **[20]**

A CLO-2 Read the following statements: (10)

(i) Here the virtual machine does not implement full isolation of OS but rather provides a different API which is utilized when OS is subjected to alteration.
(ii) This uses hyper calls at compile time for operations.
(iii) Performance is higher.

Do the above-mentioned statements belong to Full Virtualization or Para Virtualization? How both techniques are different from each other? Which of these categories do VMware and Xen fit into? (i.e. either these belong to Full Virtualization or Para-virtualization). Also, give the justification for the same.

B CLO-3 The Virtual Machine (VM) is a computing virtualized resource that runs programs and deploys apps using software (virtualized environment) instead of a physical computer. A physical "host" computer hosts one or more virtual "guest" PCs. Virtual machines (VMs) can also be replicated (colonized) across many servers. What is the purpose of the VM replication or colonization? Mention the same with at least two case studies. (10)

OR

B CLO-3 The interconnection of the network should provide some mechanism to tolerate link or switch failures, this leads to two important keywords in the field of cloud computing resource management and are denoted as: (10)

(i) Fault Tolerance

(ii) Graceful degradation

As a Cloud Service Provider (CSP), how you will impose the concepts of Fault tolerance and graceful degradation in the Cloud ecosystems. Justify the same.

Q-3 Answer the following **[10]**

A CLO-2 Read the following statements: (5)

Hypervisors can be responsible for creating and hosting multiple virtual servers. Because of this dependency, any failure conditions that affect a hypervisor can cascade to its virtual servers.

How the aforementioned problem can be solved by using the keyword: "*heartbeats*"? How the VIM and heartbeats are related to each other?

B CLO-4 Discuss the role of the Reputation in the Trusted Cloud Mechanisms. How the Trust Overlay Network scheme supports the trusted cloud services? (5)

OR

B CLO-4 How traditional computers and virtual machines are different from each other? Illustrate the same with a diagram. (5)

SECTION-II

Q-4 Answer the following **[25]**

A CLO-3 Increased awareness of energy consumption in data centres has encouraged the practice of dynamic consolidating VMs in a fewer number of servers. In cloud infrastructures, where applications have variable and dynamic needs, capacity management and demand prediction are especially complicated. How these challenges can be solved using the *DYNAMIC RESOURCE ALLOCATION in Cloud Computing?* (10)

B CLO-1 What is the necessity of the Market-oriented Cloud Computing architecture? What are the various entities that result's to this architecture? (5)

C CLO-4 State True or False. Also, Justify the same. (10)

i) The SaaS cloud delivery model offers cloud consumers a high level of administrative control over "raw" infrastructure-based IT resources.

ii) The PaaS cloud delivery model enables a cloud provider to offer a pre-configured environment that cloud consumers can use to build and deploy cloud services and solutions with decreased administrative control.

iii) SaaS is a cloud delivery model for shared cloud services that can be positioned as commercialized products hosted by clouds.

iv) Different combinations of IaaS, PaaS, and SaaS are not possible.

v) A cloud resource administrator is a person or organization responsible for administering a cloud-based IT resource (including cloud services).

Q-5 Do as directed **[15]**

A CLO-3 With the advancement in technology and changes to data centre infrastructure, new challenges have been arising and the old ones continue to evolve. Think of yourself as a Cloud Service Provider and mention any five data centre management issues. (10)

B CLO-4	Consider the following statement: "The failure of any physical node may disable some VMs installed on the failing nodes. But the failure of VMs will not pull down the host system." How the failure of VMs will not pull down the host systems? Justify the same by taking an appropriate example.	(5)

OR

B CLO-4	A virtual server is created from a template configuration called a virtual server image (or virtual machine image). It's also important to harden the same. Provide the reasons for implementing the hardening of the Cloud-based virtual system.	(5)

Q-6 Answer the following **[10]**

A CLO-2	Give an example to support your reasoning for the following statement "The purpose of using VMs is to consolidate multiple functionalities on the same server. This will greatly enhance the server utilization and application flexibility."	(5)
B CLO-1	What are AMAZONE WEB SERVICES (AWS) and EC2 instances? What types of services does it provide? Also mention about the cloud federation.	(5)

OR

B CLO-1	Explain the concept of Simple Storage Service(S3) provided by AMAZON web services. What are its utilities?	(5)

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