PRESIDENCY UNIVERSITY
BENGALURU

SCHOOL OF ENGINEERING

TEST 1

Sem & AY: Odd Sem 2019-20

Course Code: CSE 306

Course Name: CLOUD COMPUTING

Program & Sem: B.Tech (CSE) & VII DE

Date: 30.09.2019

Time: 9:30AM to 10:30AM

Max Marks: 40

Weightage: 20%

Instructions:

(i)   Read the question properly and answer accordingly.

(ii)   Question paper consists of three parts.

Part A [Memory Recall Questions]

Answer all the Questions. Each Question carries one mark.   **(10Qx1M=10M)**

1.

(i)   Cloud Computing is a combination of Distributed Computing and Utility Computing.

    (a) True

    (b) False

(ii)   Which of the following is/are NOT a property of Distributed Computing?

    (a) Load Sharing

    (b) Broad Network Access

    (c) Pay on Usage

    (d) Fault Tolerance

(iii)   Virtual machines are costlier than actual machines.

    (a)True

    (b)False

(iv)   Which of the following is/are SaaS?

    (a) Google App Engine

    (b) Aneka

    (c) Amazon EC2

    (d) Google Docs

(v)   SOAP is a format for sending messages and is also called as _____

    (a) Network Protocol

    (b) Data Transfer Protocol

    (c) Communication Protocol

    (d) XML description Protocol

(vi)   Which of the following cloud concept is related to pooling and sharing of resources?
(a) Polymorphism
(b) Abstraction
(c) Virtualization
(d) None of these

(vii)   _____ is a complete operating environment with applications, management, and the user interface.
(a) IaaS
(b) PaaS
(c) SaaS
(d) All of the above

(viii)   In a _____ scheme, the VM is installed as a Type 1 Hypervisor directly onto the hardware.
(a) Para virtualization
(b) Full virtualization
(c) Emulation
(d) None of the above

(ix)   Which of the following is a classic example of an IaaS service model?
(a) AWS
(b) Azure
(c) Google App Engine
(d) Salesforce.com

(x)   Which of the following type of virtualization is also characteristic of cloud computing?
(a) Storage
(b) Application
(c) CPU
(d) All of these

Q .NO(i-x) – (C.O.NO.1) [Knowledge]

Part B [Thought Provoking Questions]

Answer all the Questions. Each Question carries six marks.   (3Qx6M=18M)

2. Explain the Cloud Computing Reference Model with a neat diagram.

(C.O.NO.1) [Knowledge]

3. List and explain the three major milestones of distributed systems that led to the evolution of Cloud Computing.   (C.O.NO.1) [Knowledge]

4. Define Hypervisor. With a neat diagram, explain two types of hypervisors.

(C.O.NO.1) [Knowledge]

Part C [Problem Solving Questions]

Answer the Question. The Question carries twelve marks.   (1Qx12M=12M)

5.

a. With a neat diagram, explain VMware's End User (Desktop) Virtualization (VMWare Workstation Architecture).   (C.O.NO.1] [Comprehension] (8M)

b. Cloud computing has some interesting characteristics that bring benefits to both cloud service consumers (CSCs) and cloud service providers (CSPs). List and explain these characteristics.   (C.O.NO.1] [Comprehension] (4M)

PRESIDENCY UNIVERSITY
BENGALURU

SCHOOL OF ENGINEERING

TEST 1

Odd Semester: 2019-20

Course Code: CSE 306

Course Name: Cloud Computing

Program & Sem: B.Tech (CSE) & 7th

Date: 27th September 2019

Time: 1 Hour

Max Marks: 40

Weightage: 20%

Extract of question distribution [outcome wise & level wise]

Q.No.	C.O.NO	Unit/Module Number/Unit /Module Title	Memory recall type [Marks allotted] Bloom's Levels			Thought provoking type [Marks allotted] Bloom's Levels			Problem Solving type [Marks allotted]			Total Marks
			K			C			A			
1	CO1		10									10
2	CO1	1 / Introduction to	6									6
3	CO1	Cloud and	6									6
4	CO1	Virtualization	6									6
5	CO1					12					-	12
	Total Marks		28			12						40

K =Knowledge Level C = Comprehension Level, A = Application Level

Note: While setting all types of questions the general guideline is that about 60% Of the questions must be such that even a below average students must be able to attempt, About 20% of the questions must be such that only above average students must be able to attempt and finally 20% of the questions must be such that only the bright students must be able to attempt.

[I hereby certify that All the questions are set as per the above guide lines ___Md. Ziaur Rahman___ Sign _____]

Reviewers' Comments

Annexure- II: Format of Answer Scheme

GAIN MORE KNOWLEDGE
REACH GREATER HEIGHTS

PRESIDENCY UNIVERSITY
BENGALURU
SCHOOL OF ENGINEERING

TEST 1

Odd Semester: 2019-20

Course Code: CSE 306

Course Name: Cloud Computing

Program & Sem: B.Tech (CSE) & 7th
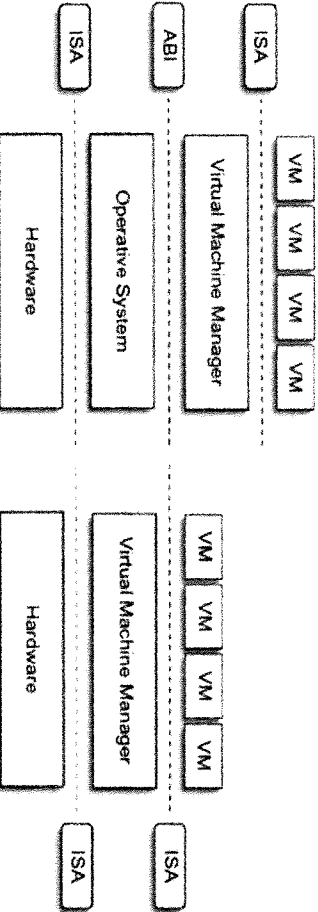
Date: 27th September 2019

Time: 1 Hour

Max Marks: 40

Weightage: 20%

Part A

(10Q x 1M = 10Marks)

Q No	Solution	Scheme of Marking	Max. Time required for each Question
1.	i. a) True ii. c) Pay on usage iii. b) False iv. d) Google Docs v. c) Communication Protocol vi. c) Virtualization vii. a) IaaS viii. b) Full Virtualization ix. a) AWS x. d) All of these	1 x 10 = 10 Marks	10 Minutes

Part B

| Q No	Solution	Scheme of Marking	Max. Time required for each Question
2.	**Cloud Computing Reference Model** i. **IaaS:** At the base of the stack, Infrastructure-as-a-Service solutions deliver infrastructure on demand in the form of virtual hardware, storage, and networking. Virtual hardware is utilized to provide compute on demand in the form of virtual machine instances. These are created at users' request on the provider's infrastructure, and users are given tools and interfaces to configure the software stack installed in the virtual machine. ii. **PaaS:** They deliver scalable and elastic runtime environments on demand and host the execution of applications. These services are backed by a core middleware platform that is responsible for creating the abstract environment where applications are deployed and executed. It is the responsibility of the service provider to provide scalability and to manage fault tolerance. iii. **SaaS:** At the top of the stack, Software-as-a-Service solutions provide applications and services on demand. Most of the common functionalities of desktop applications—such as office automation, document management, photo editing, and customer relationship management (CRM) software—are replicated on the provider's	Diagram – 3M Explanation of three Models 1M x 3 = 3M	10 Minutes

	infrastructure and made more scalable and accessible through a browser on demand.		
3.	**Mainframes:** These were the first examples of large computational facilities leveraging multiple processing units. Mainframes were powerful, highly reliable computers specialized for large data movement and massive input/output (I/O) operations. Batch processing was the main application of mainframes. **Clusters:** Cluster computing started as a low-cost alternative to the use of mainframes and super computers. The technology advancement that created faster and more powerful mainframes and supercomputers eventually generated an increased availability of cheap commodity machines as a side effect. Cluster technology contributed considerably to the evolution of tools and frameworks for distributed computing, including Condor, Parallel Virtual Machine (PVM), and Message Passing Interface (MPI). **Grids:** Grid computing appeared in the early 1990s as an evolution of cluster computing. Grid computing proposed a new approach to access large computational power, huge storage facilities, and a variety of services. Users can "consume" resources in the same way as they use other utilities such as power, gas, and water.	Explanation about Mainframes , Clusters and Grid – 3 x 2 = 6 Marks	10 Minutes
4.	**Hypervisors:** A fundamental element of hardware virtualization is the hypervisor, or virtual machine manager (VMM). It recreates a hardware environment in which guest operating systems are installed. There are two major types of hypervisor: Type I and Type II	Definition of Hypervisor – 1M Diagram – 2M Explanation of two types of Hypervisors – 3M	**10 Minutes**

VM VM VM VM

ISA

Virtual Machine Manager

ABI

Operative System

ISA

Hardware

VM VM VM VM

ISA

Virtual Machine Manager

Hardware

Type I hypervisors run directly on top of the hardware. Therefore, they take the place of the operating systems and interact directly with the ISA interface

to allow the management of guest operating systems. This type of hypervisor is also called a native virtual machine since it runs natively on hardware.
Type II hypervisors require the support of an operating system to provide virtualization services. This means that they are programs managed by the operating system, which interact with it through the ABI and emulate the ISA of virtual hardware for guest operating systems. This type of hypervisor is also called a hosted virtual machine since it is hosted within an operating system.

Part C

(1Q x 12M = 12 Marks)

Q No	Solution	Scheme of Marking	Max. Time required for each Question
5	a. __End User (Desktop) Virtualization:__	End User Virtualization: Diagram – 4M Explanation – 4M	14 Minutes
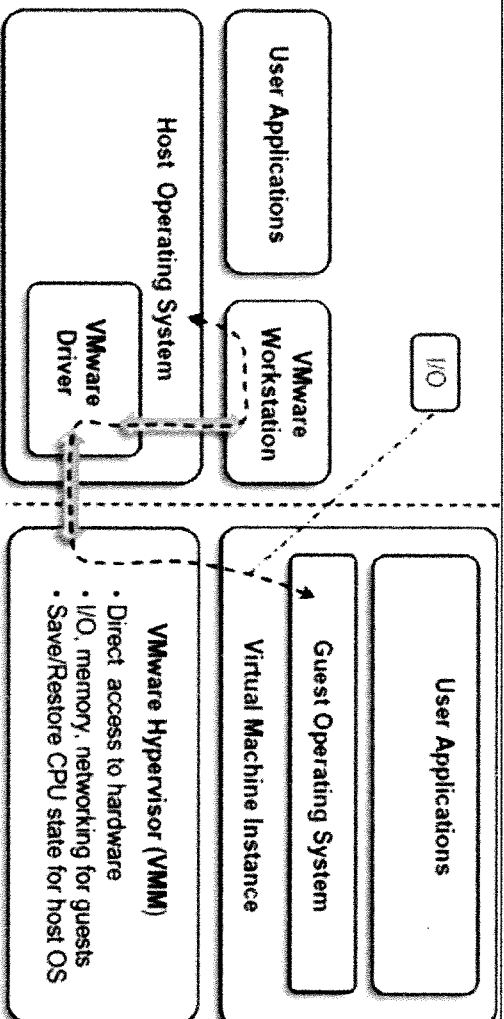
VMware supports virtualization of operating system environments and single applications on end-user computers. The first option is the most popular and allows installing a different operating systems and applications in a completely isolated environment from the hosting operating system. Specific VMware software—VMware Workstation, for Windows operating systems, and VMware Fusion, for Mac OS X environments—is installed in the host operating system to create virtual machines and manage their execution. The virtualization environment is created by an application installed in guest operating systems, which provides those operating systems with full hardware virtualization of the underlying hardware. This is done by installing a specific driver in the host operating system that provides two main services:

➤ It deploys a virtual machine manager that can run in privileged mode.
➤ It provides hooks for the VMware application to process specific I/O requests.

Other solutions related to the virtualization of end-user computing environments include VMware Player, VMware ACE, and VMware ThinApp. VMware Player is a reduced version of VMware Workstation that allows creating and playing virtual machines in a Windows or Linux operating envi-ronment. VMware ACE, a similar product to VMware Workstation, creates policy-wrapped virtual machines for deploying secure corporate virtual environments on end-user computers. VMware ThinApp is a solution for application virtualization. It detects all the

changes to the operating environment made by the installation of a specific application.		
b. Characteristics of Cloud Computing: ➢ No up-front commitments ➢ On-demand access ➢ Nice pricing ➢ Simplified application acceleration and scalability ➢ Efficient resource allocation ➢ Energy efficiency ➢ Seamless creation and use of third-party services	Explanation of any 4 Characteristics – 1 x 4 = 4M	**6 Minutes**

PRESIDENCY UNIVERSITY
BENGALURU

SCHOOL OF ENGINEERING

TEST – 2

Sem & AY: Odd Sem. 2019-20

Course Code: CSE 306

Course Name: CLOUD COMPUTING

Program & Sem: B.Tech (CSE) & VII (DE)

Date: 16.11.2019

Time: 9.30 AM to 10.30 AM

Max Marks: 40

Weightage: 20%

Instructions:
(i)   Read the question properly and answer accordingly.
(ii)   Question paper consists of 3 parts.

Part A [Memory Recall Questions]

Answer all the Questions. Each Question carries one mark.   **(7Qx1M=7M)**

(C.O.NO.1)[Knowledge]

1) Information technology departments are most likely to have responsibility for:
(a) Human resource functions (i.e. employee reviews, recruitment, compensation, etc.)
(b) Managing the technology infrastructure for an organization (i.e. computers, software, networks, etc.)
(c) Sales functions (i.e. selling a computer to a customer)

2) You have been asked to deploy a new information technology system for your organization. At a minimum, you should include the following components:
(a) Compute, network, and mobile device
(b) Compute, storage, network, software
(c) Application

3) Which of these are disadvantages of the traditional IT on-premise deployment model?
(a) Large upfront cost, lack of elasticity, may require large no. of staff, have to manage the physical equipment
(b) More control over technology infrastructure
(c) Inflexibility

4) Which of the following is not considered a Web application?
(a) Google Docs
(b) Gmail
(c) OneDrive
(d) None of the above

5) Which of the following is most important area of concern in cloud computing?
a) Security
b) Storage
c) Scalability
d) All of the mentioned

6) A service that lays focus on hardware follows the _____ as a Service model.
a) IaaS
b) CaaS
c) PaaS
d) All of the mentioned

7) The _____ cloud infrastructure is operated for the exclusive use of an organization.
a) Public
b) Private
c) Community
d) All of the mentioned

Part B [Thought Provoking Questions]

Answer all the Questions. Each Question carries seven marks   (3Qx7M=21M)

8. Describe MPI structure with a neat diagram.   (C.O.NO.1) [Knowledge]

9. Explain with neat diagram, PaaS reference model.   (C.O.NO.1) [Knowledge]

10. Differentiate between high-performance computing, high-throughput computing and many-task computing, with suitable examples.   (C.O.NO.1) [Knowledge]

Part C [Problem Solving Questions]

Answer the Question. The Question carries twelve marks.   (1Qx12M=12M)

11. With a diagram, explain Anekas task programming model scenario
                                                    (C.O.NO.1) [Comprehension]

SCHOOL OF ENGINEERING

Date: 16-11-2019

Semester: 7 SEM

Time: 1 HR

Course Code: CSE 306

Max Marks: 40

Course Name: CLOUD COMPUTING

Weightage: 20%

**GAIN MORE KNOWLEDGE
REACH GREATER HEIGHTS**

Extract of question distribution [outcome wise & level wise]

Q.NO.	C.O.NO	Unit/Module Number/Unit /Module Title	Memory recall type [Marks allotted] Bloom's Levels		Thought provoking type [Marks allotted] Bloom's Levels		Problem Solving type [Marks allotted]		Total Marks
			K		C		A		
1 - 7	1	M1	1*7						7
8-10	1	M1	7*3						21
11	1	M1			12*1				12
	Total Marks		28		12				40

K =Knowledge Level   C = Comprehension Level, A = Application Level

Note: While setting all types of questions the general guideline is that about 60%

Of the questions must be such that even a below average students must be able to attempt, About 20% of the questions must be such that only above average students must be able to attempt and finally 20% of the questions must be such that only the bright students must be able to attempt.

Annexure- II: Format of Answer Scheme

SCHOOL OF ENGINEERING

SOLUTION

GAIN MORE KNOWLEDGE
REACH GREATER HEIGHTS

Semester: 7 SEM

Course Code: CSE 306

Course Name: CLOUD COMPUTING

Date: 16-11-2019

Time: 1 HR

Max Marks: 40

Weightage: 40%

Part A   (10Q x 1M = 10 Marks)

Q No	Solution	Scheme of Marking	Max. Time required for each Question
1	b	1 mark	1 min
2	b	1 mark	1 min
3	a	1 mark	1 min
4	d	1 mark	1 min
5	a	1 mark	1 min
6	a	1 mark	1 min
7	b	1 mark	1 min

Part B   (3Q x 7M = 21Marks)

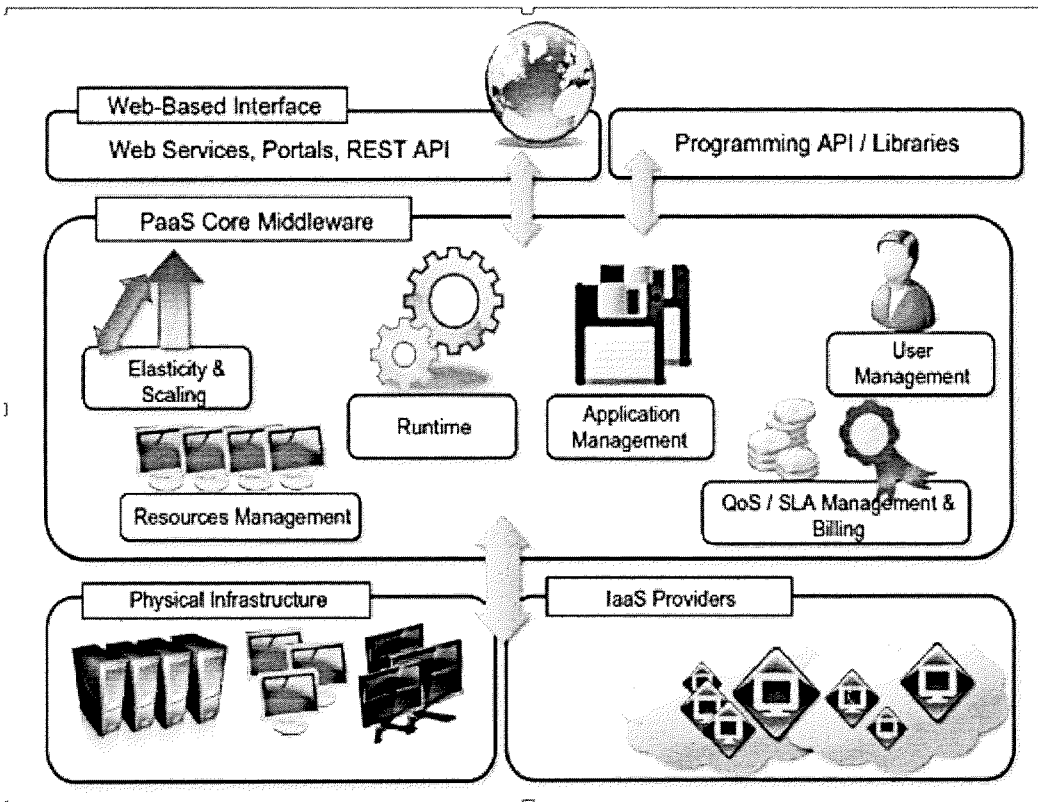| Q No	Solution	Scheme of Marking	Max. Time required for each Question
8	MPI stands for *Message Passing Interface*. ➢ Is a specification for developing parallel programs that communicate through message passing. ➢ MPI provides developers with a set of routines	7 marks	7 min

MPI Reference Scenario
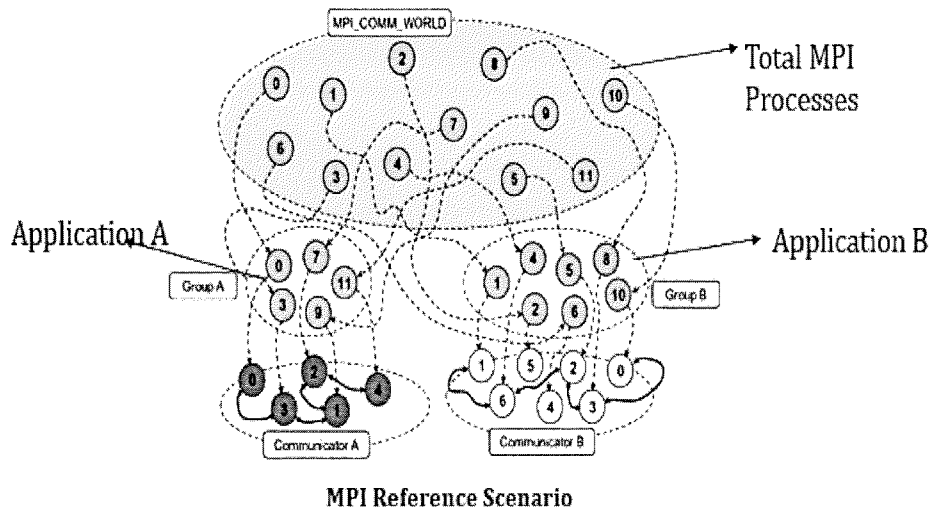
9	Platform-as-a-Service (PaaS) solutions provide a development and deployment platform for running applications in the cloud. They constitute the middleware on top of which applications are built. 	**7 marks**	7 min
10	**HPC:** Use of distributed cloud computing facilities for solving problems that need large computing power. ➢ Supercomputers were used for these kind of tasks ➢ Large collection of compute-intensive tasks that need to be processed in *a short period of time.*	**7 marks**	7 min

HTC: Use of distributed cloud computing facilities for solving problems that need large computing power over a *long period of time*.

➤ Computing grids (clusters, workstations, voluntary desktops) were used for computation.
➤ Typical execution time: Weeks or Months

MTC: Bridges the gap between HPC and HTC.

➤ It is mainly a type of HTC, but concentrates on using computing resources for a short period of time to accomplish *many computational tasks.*
➤ Types of tasks include:
• Small
• Large
• Static
• Dynamic
• Compute-intensive
• Data-intensive in nature.

Part C   (1Q x 12M = 12Marks)

Q No	Solution	Scheme of Marking	Max. Time required for each Question
11	Refer diagrams below	**12 marks**	15 min

- ➢ Aneka provides task based programming support through the abstraction of *Aneka.Tasks.ITask* interface.
- ➢ Aneka supports the execution of:
  - o Embarrassingly parallel applications
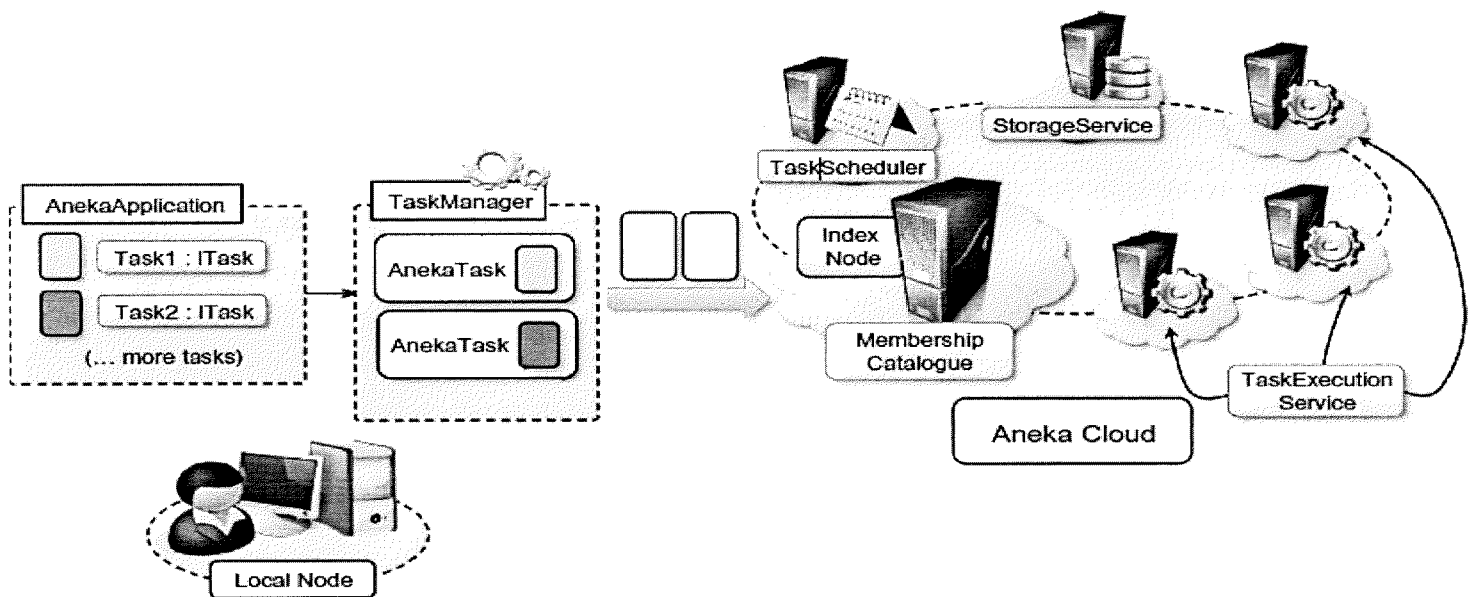 - o Parameter Sweep applications
  - o Workflows

mportant classes and Interfaces in Aneka Task Programming

lamespace – Aneka.Tasks.dll

mportant classes – AnekaApplication, TaskManager, AnekaTask

mportant Interface – Aneka.Tasks.ITask

ne┗ऀ Task Programming Model Scenario

Roll No.

Instructions:
(i)   *Read the question properly and answer accordingly.*
(ii)   *Question paper consists of 3 parts.*

Part A [Memory Recall Questions]

Answer all the Questions. Each Question carries 02 marks.   **(10Qx2M=20M)**

Fill in the missing details.

1. Information technology departments are most likely to have responsibility for _____
                                                        (C.O.No.1) [Knowledge]

2. You have been asked to deploy a new information technology system for your organization. At a minimum, _____ components would be part of the IT system
                                                        (C.O.No.1) [Knowledge]

3. _____ are disadvantages of the traditional IT on-premise deployment model?
                                                        (C.O.No.1) [Knowledge]

4. An enterprise computer system is _____   (C.O.No.1) [Knowledge]

5. _____ is an example of virtual machine that can be installed on a Windows 10 system   (C.O.No.4) [Comprehension]

6. _____ is the primary area of concern in cloud computing?   (C.O.No.3) [Knowledge]

7. _____ are characteristics applicable to Cloud Computing?
                                                        (C.O.No.1) [Knowledge]

8. A service that lays focus on hardware follows the _____ as a Service model
(C.O.No.1) [Knowledge]

9. The _____ cloud infrastructure is operated for the exclusive use of an organization.
(C.O.No.1) [Knowledge]

10. _____ is an example of distributed file system for data storage and processing
(C.O.No.2) [Knowledge]

Part B [Thought Provoking Questions]

Answer all the Questions. Each Question carries 08 marks   **(5Qx8M=40M)**

11. List the benefits of Cloud Computing   (C.O.No.1) [Knowledge]

12. Explain the concept of distributed system, and list down the types of distributed systems
(C.O.No.1) [Knowledge]

13. Explain with graphical representation, the two types of hypervisors.

(C.O.No.1) [Knowledge]

14. Explain the Gartner list of seven security issues for Cloud computing vendor

(C.O.No.3) [Comprehension]

15. Explain in detail the different Cloud Computing models   (C.O.No.1) [Knowledge]

Part C [Problem Solving Questions]

Answer both the Questions. Each Question carries 10 marks.   **(2Qx10M=20M)**

16. List and explain any 3 Cloud computing platforms and technologies
(C.O.No.1) [Comprehension]

17. (a) Draw the Cloud Computing Reference model.
    (b) Describe the different layers in the Reference model
(C.O.No.1) [Comprehension]

SCHOOL OF ENGINEERING

Semester: 7 SEM

Course Code: CSE 306

Course Name: CLOUD COMPUTING

Date: 20-12-2019

Time: 3 HR

Max Marks: 80

Weightage: 40%

Extract of question distribution [outcome wise & level wise]

Q.NO.	C.O.NO	Unit/Module Number/Unit /Module Title	Memory recall type [Marks allotted] Bloom's Levels		Thought provoking type [Marks allotted] Bloom's Levels		Problem Solving type [Marks allotted]			Total Marks
			K		C		A			
1 - 10	1, 2, 3, 4	M1, M2, M3, M4	2*9		2*1					20
11	1	M1	8							8
12	1, 2	M1, M2	8							8
13	1	M1	8							8
14	3	M3			8					8
15	1	M1	8							8
16	1	M4			10					10
17	1	M1			10					10
	Total Marks		50		30					80

K =Knowledge Level   C = Comprehension Level, A = Application Level

Note: While setting all types of questions the general guideline is that about 60%

Of the questions must be such that even a below average students must be able to attempt, About 20% of the questions must be such that only above average students must be able to attempt and finally 20% of the questions must be such that only the bright students must be able to attempt.

I hereby certify that all the questions are set as per the above guidelines.

Faculty Signature:

Reviewer Commend:

Annexure- II: Format of Answer Scheme

SCHOOL OF ENGINEERING

SOLUTION

Part A   (10Q x 1M = 10 Marks)

Q No	Solution	Scheme of Marking	Max. Time required for each Question
1	Managing the technology infrastructure for an organization	2 marks	2 min
2	Compute, storage, network, software	2 marks	3 min
3	Large upfront cost, lack of elasticity, large number of	2 marks	3 min

	staff to manage the equipment		
4	A large computer system called a server, that runs Linux, Windows, or UNIX	**2 marks**	**3 min**
5	One of Oracle VM Virtualbox, VMware Workstation, Hyper V	**2 marks**	**2 min**
6	Security	**2 marks**	**2 min**
7	Utility type of delivery, elasticity, low barrier to entry	**2 marks**	**3 min**
8	IaaS	**2 marks**	**1 min**
9	Private	**2 marks**	**1 min**
10	One of Lustre file system, IBM General Parallel File System (GPFS), Google File System (GFS), Amazon Simple Storage Service (S3)	**2 marks**	**3 min**

Part B   (5Q x 8M = 40Marks)

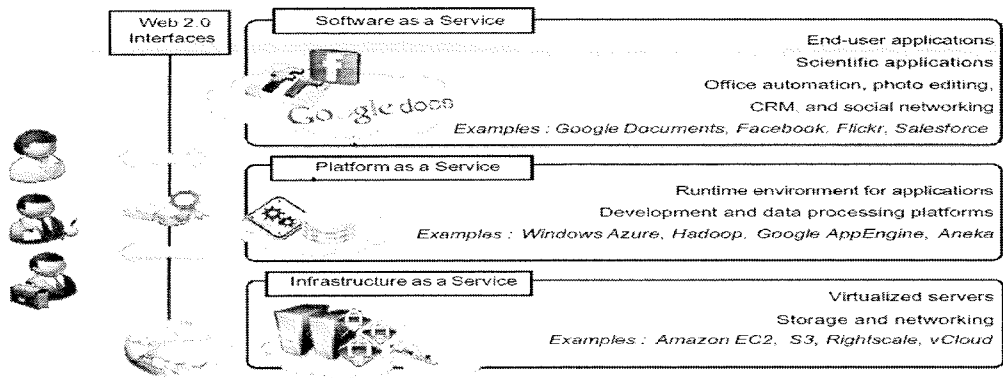| Q No	Solution	Scheme of Marking	Max. Time required for each Question
11	a. No up-front commitments b. On-demand access c. Nice pricing d. Simplified application acceleration and scalability e. Efficient resource allocation f. Energy efficiency	**8 marks**	10 min

12	A distributed system is a collection of independent computers that appears to its users as a single coherent system. Mainframes - Used for bulk data processing tasks involving online transactions, ERP, Supercomputers Clusters - Cheap machines connected by high-bandwidth network Grid computing - Appeared in 90s, Users can consume resources as utilities such as power, gas and water. Cloud computing - Large datacenters hosted by single organization, have infinite virtual capacity and tolerant to failures, pay-per-use basis	**8 marks**	15 min
13	Hypervisor is the *most important component* within the Virtualization layer. A hypervisor is a function which abstracts / isolates the operating systems and applications from the underlying computer hardware. A hypervisor is sometimes also called a **Virtual Machine Manager (VMM)**. 	**8 marks**	20 min
14	The technology analyst and consulting firm Gartner lists seven security issues for Cloud computing vendor are ➤ Privileged user access: Inquire about who has specialized access to data, and about the hiring and management of such administration ➤ Regulatory Compliance: Make sure that ➤ Data Location: Does the provider allow for any control over the location of data? ➤ Data Segregation: Make sure that encryption is applicable at all stages, and that these encryption schemes were designed and tested by experienced professionals. ➤ Recovery: Find out what will happen to data in the case of a disaster. Do they offer complete restoration? If so, how long would that take? ➤ Investigative support: does the vendor have the ability to investigate any inappropriate or illegal activity? ➤ Long-term viability: What will happen to data if the company goes out of business? How will data be returned, and in what format.	**8 marks**	12 min

15	a. **Public Cloud** - A model where services are offered over the Internet that is open for public use, on a pay-per-usage basis. b. **Private Cloud** - A model where the services are offered to a single organization. c. **Hybrid Cloud** - A model that is a mix of both the private and public clouds. d. **Community Cloud** - Is an infrastructure shared by several organizations supporting a specific community.	**8 marks**	10 min

Part C   (2Q x 10M = 20Marks)

Q No	Solution	Scheme of Marking	Max. Time required for each Question
16	Amazon Web Services (AWS) Offers comprehensive cloud IaaS services. AWS is known for its compute and storage on demand services, namely EC2 and S3. EC2 instances are deployed either by using AWS console or WS API S3 is organized into buckets – container of objects stored in binary form range of services: networking support, caching systems, DNS, database support and so on. Google AppEngine Scalable runtime environment for executing scalable and high performance web applications These services include: in-memory caching, scalable data storage, job queues. Developers can build and test applications on their own machine by using AppEngine SDK Languages supported are – Python, Java and Go Microsoft Azure Is a cloud operating system and a platform for developing applications Runtime environment for web applications and distributed applications Applications are organized as roles: Web role, worker role, Virtual machine role Also supports storage, networking, caching and content delivery and others	**10 marks**	20 min
17	Refer diagram and explanation provided below:	**10 marks**	20 min

FIGURE 1.5

The Cloud Computing Reference Model.

The Cloud Computing Reference Model organizes the wide range of cloud computing services into a layered view that walks the computing stack from bottom to top.

At the base of the stack, Infrastructure-as-a-Service solutions deliver infrastructure on demand in the form of virtual hardware, storage, and networking. Virtual hardware is utilized to provide compute on demand in the form of virtual machine instances. Virtual storage is delivered in the form of raw disk space or object store.

Platform-as-a-Service solutions are the next step in the stack. They deliver scalable and elastic runtime environments on demand and host the execution of applications. These services are backed by a core middleware platform that is responsible for creating the abstract environment where applications are deployed and executed.

At the top of the stack, Software-as-a-Service solutions provide applications and services on demand.