CLOUD COMPUTING (CS714PE)
COURSE PLANNER

I. COURSE OVERVIEW:

Cloud Computing is a large scale distributed computing paradigm which has become a driving force for information technology over the past several years. The exponential growth data size in scientific instrumentation/simulation and social media has triggered the wider use of cloud computing services. We will explore solutions and learn design principles for building large network based systems to support both compute and data intensive computing across geographically distributed infrastructure.

II. PREREQUISITE:

- A course on "Computer Networks".
- A course on "Operating Systems".
- A course on "Distributed Systems".

III. COURSE OBJECTIVES:

1	This course provides an insight into cloud computing
2	Topics covered include- distributed system models, different cloud service models, service-oriented architectures, cloud programming and software environments, resource management.

IV. COURSE OUTCOMES:

Course Outcomes	Description	Bloom's Taxonomy Levels
CO1	Understand the concepts of computing paradigms	L2:Understand
CO2	Ability to understand the concepts of cloud computing and Deployment Models	L2:Understand
CO3	Ability to understand various service of a network connectivity and managing cloud.	L4:Analyzing
CO4	Understanding cloud service providers.	L2:Understand
CO5	Understand the concepts of real time applications.	L3:Apply

V. HOW PROGRAM OUTCOMES ARE ASSESSED:

Program Outcomes (PO)		Level	Proficiency assessed by
PO1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems related to Computer Science and Engineering.	**2.8**	Lectures, Assignments, Exams
PO2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems related to Computer Science and	**1.8**	Lectures, Assignments, Exams

	Engineering and reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.		
PO3	**Design/development of solutions**: Design solutions for complex engineering problems related to Computer Science and Engineering and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.	**1.6**	Lectures, Assignments, Exams
PO4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.	**1.8**	Lectures, Assignments, Exams
PO5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.	**1.6**	Lectures, Assignments, Exams
PO6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the Computer Science and Engineering professional engineering practice.	---	---
PO7	**Environment and sustainability**: Understand the impact of the Computer Science and Engineering professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.	---	--
PO8	**Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.	---	--
PO9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.	**1**	Assignments, Exams

PO10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.	**1**	Lectures, Assignments, Exams
PO11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.	**---**	--
PO12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.	**1**	Research

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High) - : None

VI. HOW PROGRAM SPECIFIC OUTCOMES ARE ASSESSED:

Program Specific Outcomes (PSO)		**Level**	**Proficiency assessed by**
PSO 1	**Foundation of mathematical concepts:** To use of mathematical methodologies to crack problem using suitable mathematical analysis, data structure and suitable algorithm.	---	---
PSO 2	**Foundation of Computer System:** The ability to interpret the fundamental concepts and methodology of computer systems. Students can understand the functionality of hardware and software aspects of computer systems.	**1.6**	Lectures, Assignments, Exams
PSO 3	**Foundations of Software development:** The ability to grasp the software development lifecycle and methodologies of software systems. Possess competent skills and knowledge of software design process. Familiarity and practical proficiency with a broad area of programming concepts and provide new ideas and innovations towards research.	**1.8**	Lectures, Assignments, Exams

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High) - : None

VII. SYLLABUS:

UNIT-I: Computing Paradigms: High-Performance Computing, Parallel Computing, Distributed Computing, Cluster Computing, Grid Computing, Cloud Computing, Bio computing, Mobile Computing, Quantum Computing, Optical Computing, Nano computing.

UNIT-II:Cloud Computing Fundamentals: Motivation for Cloud Computing, The Need for Cloud Computing, Defining Cloud Computing, Definition of Cloud computing, Cloud Computing Is a Service, Cloud Computing Is a Platform, Principles of Cloud computing, Five Essential Characteristics, Four Cloud Deployment Models

UNIT-III: Cloud Computing Architecture and Management: Cloud architecture, Layer, Anatomy of the Cloud, Network Connectivity in Cloud Computing, Applications on the Cloud, Managing the Cloud, Managing the Cloud Infrastructure, Managing the Cloud Application, Migrating Application to Cloud, Phases of Cloud Migration Approaches for CloudMigration.

UNIT-IV: Cloud Service Models: Infrastructure as a Service, Characteristics of IaaS. Suitability of IaaS, Pros and Cons of IaaS, Summary of IaaS Providers, Platformas a Service, Characteristics of PaaS, Suitability of PaaS, Pros and Cons of PaaS, Summary of PaaS Providers, Software as a Service, Characteristics of SaaS, Suitability of SaaS, Pros and Cons of SaaS, Summary of SaaS Providers, Other Cloud Service Models.

UNIT-V:Cloud Service Providers: EMC, EMC IT, Captiva Cloud Toolkit, Google, Cloud Platform, Cloud Storage, Google Cloud Connect, Google Cloud Print, Google App Engine, Amazon Web Services, Amazon Elastic Compute Cloud, Amazon Simple Storage Service, Amazon Simple Queue ,service, Microsoft, Windows Azure, Microsoft Assessment and Planning Toolkit, SharePoint, IBM, Cloud Models, IBM Smart Cloud, SAP Labs, SAP HANA Cloud Platform, Virtualization Services Provided by SAP, Sales force, Sales Cloud, Service Cloud: Knowledge as a Service, Rack space, VMware, Manjra soft, Aneka Platform

TEXT BOOKS:

1. Essentials of cloud Computing: K. Chandrasekhran, CRC press, 2014

REFERENCES:

1.Cloud Computing: Principles and Paradigms by RajkumarBuyya, James Broberg and Andrzej M. Goscinski, Wiley,2011.

2.Distributed and Cloud Computing, Kai Hwang, Geoffery C. Fox, Jack J. Dongarra, Elsevier,2012.

3.Cloud Security and Privacy: An Enterprise Perspective on Risks and Compliance, Tim Mather, SubraKumaraswamy, ShahedLatif, O'Reilly, SPD,rp2011.

VIII. LESSON PLAN:

S.No	UNIT	Week	Topics To be Covered	Link for PPT	Link for PDF	Course Learning Outcome	Teaching Aids	
1	I	1	**UNIT-I:Computing Paradigms:** High-Performance Computing, Parallel Computing	https://drive.google.com/drive/folders/1EXzoiUnZVkUUWPKpm_1cSUzaj7uwM5zL	https://drive.google.com/drive/folders/1EXzoiUnZVkUUWPKpm_1cSUzaj7uwM5zL	**Understand:** Performance Of Computing, Parallel Computing	CHALK &BOARD / PPT Presentation	T1
2			Distributed Computing, Cluster Computing			**Explain:** Distributed Computing, Cluster Computing		T1
3			Grid Computing			**Define:** Grid		T1

						Computing		
			Students Presentation					
4		2	Cloud Computing			**Understand:** Cloud Computing		T1
5			Bio Computing			**Describe:** Bio Computing		T1
6			Mobile Computing,Quantum Computing			**Describe:** Mobile Computing,Understand: Quantum Computing		T1
7		3	Optical Computing			**Define:** Optical Computing		T1
8			Nano Computing			**Understand:** Nano Computing		T1
			Students Presentation					
9								
10	**II**	4	**UNIT-II:Cloud Computing Fundamentals** : Motivation For Cloud Computing,	https://drive.google.com/drive/folders/1EXzoiUnZVkUUWPKpm_1cSUzaj7uwM5zL	https://drive.google.com/drive/folders/1EXzoiUnZVkUUWPKpm_1cSUzaj7uwM5zL	**Understand:** Cloud Computing Techinques	CHALK &BOARD / PPT Presentation	T1
11			The Need For Cloud Computing					T1
12			Defining Cloud Computing			**Define**: Cloud Computing		T1
			Students Presentation					
13		5	Definition Of Cloud Computing			**Describe:** Cloud Computing		T1
14			Cloud Computing Is A Service,Cloud Computing Is A Platform			**Understand:** Services Of Cloud,Define: Cloud As A Platform		T1
15			Principles Of Cloud Computing			**Describe**: Principles Of Cloud Computing		T1
16		6	Five Essential Characteristics			**Describe**:Characteristics		T1
			Students Presentation					
17			Four Cloud Deployment Models			**Describe:** Cloud Deployment Models		T1
18			** Virtual Machines and Virutualization Clusuters and Data centers,** Data			**Understand:**Virtualization,Examine:security of cloud		T1

			Security in the cloud					
19	III	7	**UNIT-III:Cloud Computing Architecture And Management:** Cloud Architecture,	https://drive.google.com/drive/folders/1EXzoiUnZVkUUWPKpm_1cSUzaj7uwM5zL	https://drive.google.com/drive/folders/1EXzoiUnZVkUUWPKpm_1cSUzaj7uwM5zL	**Understand: :** Cloud Architecture & Layers	CHALK &BOARD / PPT Presentation	T1
			Students Presentation					
20			Cloud Layer,Anatomy Of The Cloud			Understand: : Cloud Layer,Describe: Structure Of Cloud		T1
21			Network Connectivity In Cloud Computing			**Analyze:** Cloud Network		T1
22		8	Applications On The Cloud			**List:** Applications On Cloud		T1
			Students Presentation					
23			Managing The Cloud,Managing The Cloud Infrastructure			**Examine:** Management Of Cloud,Examine: Management Of Cloud Infrastucture		T1
24			Managing The Cloud Application,			**Examine:** Management Of Cloud Applications		T1
11/8/2021-11/13/2021 MID TERM-I								
25		10	Migrating Application To Cloud,Phases Of Cloud Migration	https://drive.google.com/drive/folders/1EXzoiUnZVkUUWPKpm_1cSUzaj7uwM5zL	https://drive.google.com/drive/folders/1EXzoiUnZVkUUWPKpm_1cSUzaj7uwM5zL	**Motive: Migrating Applications To Cloud,Categorize:** Phases Of Cloud Migration	CHALK &BOARD / PPT Presentation	T1
			Students Presentation					
26			Approaches For Cloud Migration.			**Analyze:** Approaches For Cloud Migration.		T1
27			***Tutorial/Bridge Class # II***					
28	IV	11	**UNIT-IV :Cloud Service Models:** Infrastructure As A Service			**Understand:** Infrastructure As A Service	CHALK &BOARD / PPT Presentation	T1
29			Characteristics Of Iaas. Suitability Of			**Describe**: Characteristics Of		T1

			Iaas,Pros And Cons Of Iaas, Summary Of Iaas Providers			Iaas,Describe: Pros And Cons Of Iaas		
30			Characteristics Of Paas, Suitability Of Paas			**Describe**: Characteristics Of Paas.		T1
31		12	Pros And Cons Of Paas,Summary Of Paas Providers			**Describe**: Pros And Cons Of Paas,Summarize: Paas Providers		T1
32			Software As A Service			**Understand:** Software As A Service		T1
			Students Presentation					
33			Characteristics Of Saas Suitability Of Saas			**Describe**: Characteristics Of Paas.		T1
34		13	Pros And Cons Of Saas,Summary Of Saas Providers			**Describe**: Pros And Cons Of Paas,Summarize: Paas Providers		T1
35			Other Cloud Service Models			**Summarize:** Cloud Service Models		T1
			Students Presentation	-	-			
36			**MOCK Test-II,Bridge Class-III**					
37	**V**	14	**UNIT-V:Cloud Service Providers:** EMC, EMC IT, Captiva Cloud Toolkit	https://drive.google.com/drive/folders/1EXzoiUnZVkUUWPKpm_1cSUzaj7uwM5zL	https://drive.google.com/drive/folders/1EXzoiUnZVkUUWPKpm_1cSUzaj7uwM5zL	**Model :** EMC, EMC IT, Captiva Cloud Toolkit	CHALK &BOARD / PPT Presentation	T1
38			Google, Cloud Platform			**Make Use Of :** Google, Cloud Platform		T1
39			Cloud Storage,Google Cloud Connect			**Make Use Of :** Cloud Storage,Utilize : Google Cloud Connect		T1
			Students Presentation					
40		15	Google Cloud Print,Google App Engine,			**Utilize :** Google Cloud Print,Google App Engine,		T1
41			Amazon Web Services			**Utilize :** Amazon Web Services		T1
42			Amazon Simple Storage Service,Amazon			**Make Use Of :** Amazon Elastic Compute Cloud		T1

			Elastic Compute Cloud					
			Students Presentation					
43		16	Amazon Simple Queue Service,Microsoft, Windows Azure			**Make Use Of :** Amazon Simple Storage Service, Amazon Simple Queue,Choose : Microsoft, Windows Azure		T1
44			Microsoft Assessment And Planning Toolkit,Sharepoint, IBM ,Cloud Models, IBM Smart Cloud			**Utilize :** Microsoft Assessment And Planning Toolkit,Develop : Cloud Models, IBM Smart Cloud		T1
45			SAP Labs, SAP HANA Cloud Platform			**Construct :** SAP Labs, SAP HANA Cloud Platform		
			Students Presentation					
46		17	Virtualization Services Provided By SAP, Sales Force			**Make Use Of :** Virtualization Services Provided By SAP, Sales Force, Sales Cloud, Service		T1
			Sales Cloud,Service Cloud: Knowledge As A Service			**Utilize:**Sales Cloud, Service,Service Cloud		
47			Rack Space, Vmware, Manjra Soft, Aneka Platform			**Utilize :** Rack Space, Vmware, Manjra Soft, Aneka Platform		T1
48		18	**01/10/2022-01/18/2022**			**MID TERM-II**		

NPTEL Web Course:

1. http://nptel.ac.in/courses/106105167/

NPTEL Video Course:

1. http://nptel.ac.in/courses/106105167/

IX. Mapping Course Outcomes Leading to the Achievement of Program Outcomes and Program Specific Outcomes:

Course Outcomes	Program Outcomes												Program Specific Outcomes		
CO	PO 1	PO 2	PO 3	PO 4	PO5	PO 6	PO 7	PO8	PO9	PO 10	PO 11	PO12	PSO1	PSO2	PSO3
CO1	3	1	1	2	1	-	-	-	1	1	-	1	-	2	1
CO2	3	2	1	2	2	-	-	-	1	1	-	1	-	2	2
CO3	3	3	2	2	2	-	-	-	1	1	-	1	-	1	2
CO4	2	1	2	1	1	-	-	-	1	1	-	1	-	2	1
CO5	3	2	2	2	2	-	-	-	1	1	-	1	-	1	3
AVG	2.8	1.8	1.6	1.8	1.6	-	-	-	1	1	-	1	-	1.6	1.8

X. QUESTION BANK (JNTUH) :

UNIT I

Long Answer Questions

S.No	Question	Bloom's Taxonomy Level	Course Outcomes
1	Why is it necessary to understand the various computing paradigms?	Understand	CO1
2	Compare grid computing with electric power grid	Compare	CO1
3	Will mobile computing play a dominant role in the future? Discuss	Knowledge	CO1
4	How are distributed computing and network computing different or similar?	Compare	CO1
5	How may nano computing shape future devices?	Understand	CO1

Short Answer Questions

S.No	Question	Bloom's Taxonomy Level	Course Outcomes
1	What is Cluster computing ?	Understand	CO1
2	What is Biocomputing ?	Understand	CO1
3	What is Quantum computing ?	Understand	CO1
4	What is Optical computing ?	Understand	CO1
5	What is High-Performance computing ?	Knowledge	CO1

UNIT II

Long Answer Questions-

S.No	Question	Bloom's Taxonomy Level	Course Outcomes
1	What is cloud computing? Why is it needed?	Understand	CO2
2	Describe a real-life example to illustrate the concepts behind cloud computing.	Describe	CO2

3	Distinguish between the definition so cloud computing is a service and cloud computing is a platform	Distinguish	CO3
4	What are the service offering models of the cloud?	Understand	CO3
5	What are the deployment models of the cloud?	Understand	CO2

Short Answer Questions-

S.No	Question	Bloom's Taxonomy Level	Course Outcomes
1	Define cloud computing.	Understand	CO2
2	What are the 5-4-3 Principles of Cloud computing?	Knowledge	CO2
3	List the Five Essential Characteristics of Cloud computing	Knowledge	CO3
4	Give the NIST Definition of Cloud Computing	Knowledge	CO2
5	What is Deployment Model in Cloud Computing ?	Understand	CO2

UNIT III

Long Answer Questions-

S.No	Question	Bloom's Taxonomy Level	Course Outcomes
1	How is cloud anatomy different from cloud architecture?	Compare	CO2
2	What are the two different management classifications?	Classify	CO3
3	Describe several approaches of cloud migration.	Describe	CO3
4	What are the drawbacks of a web application?	Knowledge	CO2
5	Explain the pay-as-you-go paradigm.	Explain	CO1

Short Answer Questions-

S.No	Question	Bloom's Taxonomy Level	Course Outcomes
1	What is server consolidation?	Knowledge	CO2
2	What are the unique properties of cloud applications?	Knowledge	CO2
3	What is public cloud access networking?	Analyze	CO3
4	List the phases of cloud migration.	List	CO3
5	What is elasticity	Understand	CO1

UNIT IV

Long Answer Questions-

S.No	Question	Bloom's Taxonomy Level	Course Outcomes
1	Write short notes on end user and service provider responsibilities of cloud service models with a suitable diagram.	Summarize	CO4
2	Write short notes on the deployment and delivery of cloud service models with a neat diagram.	Summarize	CO2

3	Explain in detail about the overview of IaaS, PaaS, and SaaS with suitable diagrams.	Explain	CO4
4	Write short notes on the characteristics of IaaS, PaaS, and SaaS.	Summarize	CO4
5	Explain the suitability of different cloud service models.	Explain	CO4

Short Answer Questions-

S.No	Question	Bloom's Taxonomy Level	Course Outcomes
1	What is cloud service model?	Understand	CO3
2	Define Infrastructure as a Service(IaaS).	Explain	CO4
3	Define Platform as a Service(PaaS).	Explain	CO4
4	Define Software as a Service(SaaS).	Explain	CO4
5	List the Other Cloud Service Models.	Show	CO4

UNIT V

Long Answer Questions-

S.No	Question	Bloom's Taxonomy Level	Course Outcomes
1	What do you mean by cloud service provider? Which are the major cloud service providers?	Identify	CO4
2	List the tools /services provided by Microsoft and explain them in brief.	Model	CO5
3	What is Google Cloud Print? What are its advantages?	Make use of	CO5
4	Explain SAP HANA Cloud in brief.	Make use of	CO5
5	What are the services offered by EMC IT? Explain.	Make use of	CO5
6	Explain the services provided by IBM Smart Cloud.	Make use of	CO4
7	What are the support services offered by Amazon Web Services? Explain.	Utilize	CO5
8	What do you mean by *Knowledge as a Service*? Which company pro- vides this service? Explain.	Utilize	CO4
9	Explain the features of Aneka.	Knowledge	C05
10	What is vCloud? Explain in brief.	Knowledge	CO5

Short Answer Questions-

S.No	Question	Bloom's Taxonomy Level	Course Outcomes
1	What is cloud service?	Knowledge	CO4
2	What is cloud service provider	Knowledge	CO4
3	What are SAP Labs?	Knowledge	CO5
4	What is Sales force?	Knowledge	CO5
5	What is Rackspace Cloud?	Knowledge	CO5

XI OBJECTIVE QUESTIONS:

UNIT I

1)A paradigm of multiple autonomous computers, having a private memory, communicating through a computer network, is known as

a. **Distributed computing** b**.**Cloud computing c.Centralized computing d.Parallel computing

2)_____ is a paradigm of distributed computing to provide the customers on-demand, utility based Computing service.

a. Remote Sensing b.Remote Invocation c.**Cloud Computing d.**Private Computing

3) Quantum computing is _____ than classical computing.

a. Faster b. Slower c. **Different** d. Conventional

4)Most of the cloud architectures are built on this type of architecture.

a. Skeleton b.**grid c.**linear d.template

5)Which computing system uses the photons in visible light or infrared beams.

a. Electrical power Grid c.Qauntum Computing

b. **Optical Computing** d**.**Nano Computing

Fill in the blanks

1) **Paradigm** conveys that there is a set of practices to be followed to accomplish a task

2) **High Performance** systems are normally found in those applications where it is required to use or solve scientific problems.

3)The individual computers in a cluster can be referred to as **Computing nodes**

4) **Message passing interface(MPI)** implementation is installed to allow programs to run across all nodes simultaneously.

5) **Quantum** computers are millions of times faster than even our most powerful supercomputers today.

UNIT-2:

1)What is Cloud Computing replacing?

a. Corporate data centers c.Expensive personal computer hardware

b. Expensive software upgrades d.**All of the above**

2)"Cloud" in cloud computing represents what?

a. Wireless b.Hard drives c.People d.**Internet**

3)Which of these should a company consider before implementing cloud computing technology?

a. Employee satisfaction c.Potential cost reduction

b. Information sensitivity d.**All of the above**

4)In this type of cloud, an organization rents cloud services from cloud providers on-demand basis.

a. Private b.**Public** c**.**Protected d.Hybrid

5)Which of the following is a deployment model?

a. public b.private c.hybrid d.**All of the above**

Fill in the Blanks:

1) Flickr allows us to easily access our images no matter where we are or what type of device we are using.

2)The **world Wide Web** can be considered as the operating system for all our Internet-based applications.

3)When we store data on or run a program from the local computer's hard drive, that is called **local storage and computing**

4) **Platform** is the support on which applications run or give results to the users.

5) **Deployment models** describe the ways with which the cloud services can be made available to its customers.

UNIT-3:

1)_____ describes a cloud service that can only be accessed by a limited amount of people.

a. Data center b.**Private cloud c.**Virtualization d.Public cloud

2)_____ is the feature of cloud computing that allows the service to change in size or volume in order to meet a user's needs.

a. **Scalability** b**.**Virtualization c.Security d.Cost-savings

3)Which of the following is not a layer in the cloud architecture?

a. User/Client Layer b.Network Layer c.**Software Layer d.**Hardware Resource Layer

4) In the case of a private cloud, the connectivity may be provided by

a. **LAN** b**.**MAN c.WAN d.None

5)How does Cloud computing change the relationship between provider and customer?

a. Increased focus on service level agreements (SLAs)
b. Less compliance to standards
c. Less focus on service level agreements (SLAs)
d. More focus on training

Fill in the Blanks

1. Cloud Management is important because of the **quality of service (QoS)** factors that are involved in the cloud.
2. **Cloud anatomy** can be simply defined as the structure of the cloud.
3. **Elasticity** allows the cloud providers to efficiently handle the number of users.
4. **Postmigration** tests are conducted to ensure that migration has been successful.
5. **Consolidation** would reduce the energy consumption and in some cases would increase the performance of the cloud.

UNIT-4:

1) _____ services are provided by the service provider on an on-premise or dedicated or hosted cloud infrastructure.

a. IaaS b. **PaaS** **c.**SaaS d.UIaaS

2)These cloud services are of the form of utility computing i.e. the _____ uses these services pay-as-you-go model.

a. Cloud providers b.Clients c.End users d.**Cloud users**

3)Which one of these is not a cloud computing pricing model?

a. Free b.Pay Per Use c.Subscription d.**Ladder e.**Perpetual License

4)Which of these is not a major type of cloud computing usage?

a. **Hardware as a Service** **c.**Platform as a Service
b. Software as a Service d.Infrastructure as a Service

5)Which of the following is best known service model ?

a. IaaS b.PaaS c.SaaS d.**All of the above.**

Fill in the Blanks:

1. Since the SaaS application is shared between many end users, there is a possibility of **Data leakage .**
2. The **hybrid cloud** is any combination of the public, private, and community clouds.
3. Technology **virtualization** is used to provide the virtual resources.
4. **Resource utilization** is the most important criteria to succeed in the IT business.
5. PaaS providers allow the developer to synchronize their **local IDE** with the PaaS services.

UNIT 5

1) _____ provides applications and tools in a service model for business enablement.

a. IaaS b.PaaS c.**SaaS** d.UIaaS

2)What is the truth about an application service provider?

a. It offers Computer Infrastructure c.**It offers Software as service.**

b. It offers Internet as service d.It offers Metered service to the customer.

3)Which of the following is not a cloud stakeholder?

a. Cloud providers b.**Clients** c.End users d.Cloud users

4)Which of these companies is not a leader in cloud computing?

a. Google b.Amazon c.**Blackboard** d. Microsoft

5)Which is not a major cloud computing platform?

a. Google 101 b.**IBM Deep blue** c.Microsoft Azure d.Amazon EC2

Fill in the Blanks

1. **SQS** makes it simple and cost effective to decouple the components of a cloud application
2. Using **Captiva Cloud Toolkit** developers can quickly create a working scan-enabled web-based business application in as early as 1 week.
3. Google Cloud Storage is a **RESTful** online file storage web service for storing and accessing one's data on Google's infrastructure
4. **Google App Engine** lets the user run web applications on Google's infrastructure.
5. **Manjrasoft** is one of the nonmajor providers of cloud services.

XII WEBSITES:

1) *cloudplatform.googleblog.com*
2) *computer.org/cloud-computing*
3) *itworld.com/category/cloud-c*

XIII EXPERT DETAILS:

K. Chandrasekaran, Anthony T.Velte, John W. Rittinghouse, RajkumarBuyya

XIV JOURNALS:

1. *International Journal of Next-Generation Computing (IJNGC)*
2. *International Journal of Cloud Computing and Services Science*
3. *International Journal of Cloud Applications and Computing (IJCAC)*

XV LIST OF TOPICS FOR STUDENT SEMINARS:

1) Aneka System
2) Comet Cloud
3) T-Systems
4) Green Computing
5) Hybrid Computing

XVI CASE STUDIES / SMALL PROJECTS

1. Data Security in the Cloud
2.Legal Issues in Cloud computing
3.Achieving Production Readiness for Cloud Services