INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)
Dundigal, Hyderabad-500043

INFORMATION TECHNOLOGY

TUTORIAL QUESTION BANK

Course Title	**CLOUD COMPUTING**				
Course Code	AIT007				
Programme	B.Tech				
Semester	VII	IT			
Course Type	Core				
Regulation	**IARE - R16**				
Course Structure	**Theory**			**Practical**	
	Lectures	**Tutorials**	**Credits**	**Laboratory**	**Credits**
	3	1	4	3	2
Chief Coordinator	Mr. A Praveen, Assistant Professor				
Course Faculty	Mr. A Praveen, Assistant Professor				

COURSE OBJECTIVES:

The course should enable the students to:	
I	Understand the concepts of cloud computing for developing the cloud applications
II	Understand task scheduling algorithms and virtualization
III	Analyze the security issues in cloud environments
IV	Gain knowledge in the broad perceptive of cloud architecture and model
V	Analyze and understand the importance of various applications of cloud computing

COURSE OUTCOMES (COs):

CO 1	Understand the concept of cloud computing and challenges
CO 2	Determine the cloud models with applications
CO 3	Analyse an ability to identify and evaluate the requirements of software product
CO 4	Understand the cloud resource management and scheduling
CO 5	Understand security issues and solve by clearing risks with security

COURSE LEARNING OUTCOMES (CLOs):

AIT007.01	Define cloud computing and related concepts
AIT007.02	Understand the key dimensions of the challenges of Cloud Computing
AIT007.03	Understand the cloud services of Amazon, Google, Azure online services.
AIT007.04	Develop the applications developments of Amazon web services
AIT007.05	Understand the Cloud architecture and programming model
AIT007.06	Describe the compute intensive model and date intensive model
AIT007.07	Determine the map reducing in cloud
AIT007.08	Describe the graph processing
AIT007.09	Determine programming models of Pregl and other big data
AIT007.10	Understanding the cloud resource virtualization
AIT007.11	Describe the Emulation of CRV
AIT007.12	Determine the application virtualization, applying virtualization
AIT007.13	Understanding the Cloud Resource Management and Scheduling
AIT007.14	Determine cloud scheduling subject to deadlines
AIT007.15	Describe fairing
AIT007.16	Understand the resource management and application scaling
AIT007.17	Describe the Cloud Security i.e., Risks, Privacy and Privacy impacts assessments
AIT007.18	Understand the Compliance issues
AIT007.19	Determine the how standards deal with cloud services and virtualization
AIT007.20	Describe compliance for the cloud provider vs compliance for the customer.

TUTORIAL QUESTION BANK

UNIT- I				
SYSTEM MODELING, CLUSTERING AND VIRTUALIZATION				
Part - A (Short Answer Questions)				
S No	**QUESTIONS**	**Blooms Taxonomy Level**	**Course Outcomes**	**Course Learning Outcomes (CLOs)**
1	Define scalability.	Remember	CO 1	AIT007.01
2	Define parallel computing.	Understand	CO 1	AIT007.01
3	What is distributed computing	Remember	CO 1	AIT007.02
4	What is HPC?	Remember	CO 1	AIT007.02
5	What is HTC?	Remember	CO 1	AIT007.03
6	Define Centralized Computing.	Remember	CO 1	AIT007.03
7	What is parallel computing?	Remember	CO 1	AIT007.03
8	Define cloud computing.	Remember	CO 1	AIT007.03
9	Define Internet of Things.	Remember	CO 1	AIT007.03
10	What is Multi-core CPU?	Remember	CO 1	AIT007.03
11	What is Many-core GPU?	Remember	CO 1	AIT007.03
12	Define GPU Computing.	Remember	CO 1	AIT007.03
13	What is Virtual Machine?	Understand	CO 1	AIT007.03
14	What is Hypervisor?	Understand	CO 1	AIT007.03
15	Define cluster computing.	Remember	CO 1	AIT007.03
16	Define grid computing.	Understand	CO 1	AIT007.01
17	Define IaaS.	Remember	CO 1	AIT007.02
18	Define PaaS.	Remember	CO 1	AIT007.02
19	Define SaaS.	Remember	CO 1	AIT007.03
20	List various cloud deployment models.	Remember	CO 1	AIT007.03
Part - B (Long Answer Questions)				
1	Discuss in detail about HPC and HTC?	Understand	CO 1	AIT007.02
2	List and explain the various computing paradigm distinctions in detail?	Understand	CO 1	AIT007.02
3	What are the main objectives of HPC and HTC? Explain.	Understand	CO 1	AIT007.02
4	Discuss in detail the degrees of parallelism.	Understand	CO 1	AIT007.02
5	Discuss in detail the applications of HPC and HTC?	Understand	CO 1	AIT007.02
6	Explain the various technologies used for network-based systems.	Understand	CO 1	AIT007.03
7	Discuss the Power Efficiency of the GPU over CPU.	Understand	CO 1	AIT007.03
8	Write short notes on memory, storage and wan.	Understand	CO 1	AIT007.03
9	Explain the three VM architecture compared with the traditional physical machine with neat sketch.	Understand	CO 1	AIT007.03
10	Explain about data center virtualization for cloud computing	Understand	CO 1	AIT007.03
11	Discuss in detail about clusters of cooperative computers.	Understand	CO 1	AIT007.03
12	Explain about grid computing infrastructure with neat sketch.	Understand	CO 1	AIT007.03
13	What are the different types of computing as service offered by cloud	Remember	CO 1	AIT007.02
14	Discuss the various deployment models offered by clouds.	Remember	CO 1	AIT007.02
15	Explain software environments for distributed systems and clouds.	Remember	CO 1	AIT007.03
16	System scaling can increase or decrease resources depending on different practical factors? Explain Dimensions of Scalability	Remember	CO 1	AIT007.03
17	What are the four operational layers of distributed computing systems? Discuss	Remember	CO 1	AIT007.02
Part - C (Problem Solving and Critical Thinking Questions)				
1	What are the three computing paradigms for cloud computing	Understand	CO 1	AIT007.02
2	Draw a neat graph for hype cycle for emerging technologies	Understand	CO 1	AIT007.02
3	Sketch a three cloud service models in a cloud landscape of major providers	Understand	CO 1	AIT007.02
4	Explain in detail about evaluation of SOA	Understand	CO 1	AIT007.03
5	Explain in detail about evaluation of SOA	Understand	CO 1	AIT007.03
6	Explain about parallel and distributed programming models	Understand	CO 1	AIT007.03
7	Discuss GPU clusters for massive parallelism	Understand	CO 1	AIT007.03

8	Discuss about Tianhe-1A: The world fastest supercomputer in 2010	Understand	CO 1	AIT007.03
9	Discuss about Cray XT5 Jaguar: The Top supercomputer in 2009	Understand	CO 1	AIT007.03
10	Discuss about IBM Roadrunner: The Top supercomputer in 2008	Understand	CO 1	AIT007.03
	UNIT-II			
	VIRTUAL MACHINES AND VIRTUALIZATION OF CLUSTERS AND DATA CENTERS			
	Part – A (Short Answer Questions)			
1	Define virtualization.	Understand	CO 2	AIT007.05
2	What are the various levels of virtualization?	Understand	CO 2	AIT007.07
3	Define Container.	Understand	CO 2	AIT007.05
4	What is VMM?	Understand	CO 2	AIT007.07
5	What are the disadvantages of hardware level virtualization?	Remember	CO 2	AIT007.05
6	What are the advantages and disadvantages of OS Extensions	Understand	CO 2	AIT007.05
7	Define Hyper call.	Remember	CO 2	AIT007.07
8	Define Software Trap.	Understand	CO 2	AIT007.05
9	Define Domain.	Understand	CO 2	AIT007.09
10	Define page table.	Understand	CO 2	AIT007.07
11	Define kernel.	Remember	CO 2	AIT007.09
12	What are the various types of kernels?	Remember	CO 2	AIT007.05
13	What is Xen Architecture?	Understand	CO 2	AIT007.05
14	What is Para-Virtualization?	Understand	CO 2	AIT007.05
15	What are the disadvantages of Para-Virtualization?	Understand	CO 2	AIT007.05
16	Define KVM.	Remember	CO 2	AIT007.05
17	Define Memory Virtualization.	Understand	CO 2	AIT007.05
18	Define Virtual memory.	Remember	CO 2	AIT007.07
19	Define Machine Memory.	Understand	CO 2	AIT007.05
20	Define Green Computing.	Understand	CO 2	AIT007.09
21	Define template.	Understand	CO 2	AIT007.07
22	What is Memory Migration?	Remember	CO 2	AIT007.09
23	What is Smart Copying?	Remember	CO 2	AIT007.05
	Part - B (Long Answer Questions)			
1	Discuss in detail various levels of ritualization implementation with neat sketch.	Understand	CO 2	AIT007.05
2	What are the various requirements for a VMM? Explain.	Understand	CO 2	AIT007.07
3	Why OS Level Virtualization? Explain.	Understand	CO 2	AIT007.07
4	List and explain the advantages and disadvantages of OS Extensions.	Understand	CO 2	AIT007.07
5	Discuss in detail about Hypervisor architecture.	Understand	CO 2	AIT007.09
6	Discuss in detail about Xen Architecture.	Understand	CO 2	AIT007.09
7	Explain binary translation with full virtualization.	Understand	CO 2	AIT007.05
8	Explain para-virtualization with compiler support.	Understand	CO 2	AIT007.09
9	Discuss in detail about CPU virtualization.	Understand	CO 2	AIT007.09
10	What is Memory virtualization.? Discuss.	Understand	CO 2	AIT007.09
11	What is I/O Virtualization.? Explain	Understand	CO 2	AIT007.05
12	With neat sketch explain in detail about virtual hierarchy.	Understand	CO 2	AIT007.07
13	Discuss in detail about Physical versus Virtual Clusters.	Understand	CO 2	AIT007.05
14	Explain the Live migration process of a VM from one host to another.	Understand	CO 2	AIT007.09
15	Write short notes on File System Migration, Smart Copying, Network Migration, Memory Migration	Understand	CO 2	AIT007.09
	Part - C (Problem Solving and Critical Thinking Questions)			
1	Explain cloud computing architecture and cloud components?	Understand	CO 2	AIT007.07
2	Explain the NIST reference architecture of cloud computing in detail?	Understand	CO 2	AIT007.07
3	Explain risk from multi tenancy environment. How IDS can be used in environment?	Understand	CO 2	AIT007.09
4	Discuss SAAS, PAAS and IAAS and compare them?	Understand	CO 2	AIT007.09
5	Explain Information and Data Model for Virtual machine.	Understand	CO 2	AIT007.09
6	How does cloud architecture overcome the difficulties faced by traditional architecture? What are the three differences that separate out cloud architecture from the tradition one?	Understand	CO 2	AIT007.05

7	Explain the infrastructure of Grid computing in detail?	Understand	CO 2	AIT007.05
8	Explain multithreading model in detail?	Understand	CO 2	AIT007.09
	UNIT –III			
	CLOUD PLATFORM ARCHITECTURE			
	Part - A (Short Answer Questions)			
1	What is Public Cloud?	Remember	CO 3	AIT007.13
2	What is Private Cloud?	Remember	CO 3	AIT007.13
3	What is Hybrid Cloud?	Understand	CO 3	AIT007.13
4	What is the difference between Data Centers and Super Computers?	Remember	CO 3	AIT007.13
5	List out cloud design objectives	Remember	CO 3	AIT007.13
6	Give neat sketch for generic cloud architecture	Understand	CO 3	AIT007.13
7	What are the different cloud architecture layers?	Understand	CO 3	AIT007.13
8	List out various architectural design challenges	Remember	CO 3	AIT007.13
9	What are the various functional modules of GAE?	Understand	CO 3	AIT007.13
10	List various Amazon Web Services	Remember	CO 3	AIT007.13
11	What are the various services provided by MS-Azure?	Understand	CO 1	AIT007.03
8	What are the various data and software protection techniques?	Understand	CO 3	AIT007.15
9	Define Service-Oriented Architecture.	Remember	CO 3	AIT007.15
10	Expand WSDL, UDDI, SOAP	Remember	CO 3	AIT007.11
11	Define Web Service	Understand	CO 3	AIT007.11
12	What are the three layers of Enterprise Multitier Architecture	Remember	CO 3	AIT007.11
13	Give the structure of Enterprise Multitier Architecture.	Remember	CO 3	AIT007.11
14	Define OGSA Grid.	Understand	CO 3	AIT007.11
15	List the seven broad areas of OGSA architecture.			
	Part – B (Long Answer Questions)			
1	Explain the basic architecture of the types of clouds and their functionality with neat sketch.	Understand	CO 3	AIT007.13
2	Discuss in detail about ecosystem for private clouds with a neat sketch.	Understand	CO 3	AIT007.13
3	Discuss in detail about Infrastructure-as-a-Service (IaaS)	Understand	CO 3	AIT007.13
4	Explain about generic cloud architecture with neat diagram.	Understand	CO 3	AIT007.13
5	Explain the layered architectural development of the cloud platform for IaaS, PaaS and SaaS applications over the internet.	Understand	CO 3	AIT007.13
6	Discuss in detail about cloud architectural design challenges.	Understand	CO 3	AIT007.13
7	Explain in detail about Amazon Web Services offerings.	Understand	CO 3	AIT007.13
8	Explain in detail about MS-Windows Azure Platform for cloud computing.	Understand	CO 3	AIT007.13
9	Discuss in detail about Inter-Cloud Resource Management	Understand	CO 3	AIT007.13
10	What are the various Resource Provisioning Methods? Explain.	Understand	CO 3	AIT007.13
11	Discuss in detail about Virtual Machine Creation & Management	Understand	CO 3	AIT007.13
7	List and explain the protection schemes to secure public clouds and data centers	Understand	CO 3	AIT007.15
8	Discuss the security measures at various cloud service levels with neat sketch.	Understand	CO 3	AIT007.15
9	Explain about Enterprise Multitier Architecture in detail.	Understand	CO 3	AIT007.15
10	Explain about OGSA architecture in detail.	Understand	CO 3	AIT007.15
11	Discuss in detail about Message-Oriented Middleware	Understand	CO 3	AIT007.11
	Part - C (Problem Solving and Critical Thinking Questions)			
1	Explain in detail about VM provisioning process	Understand	CO 3	AIT007.13
2	Sketch a neat diagram for a deployment scenario network with	Understand	CO 3	AIT007.13
3	Explain VM life cycle and VM monitoring	Understand	CO 3	AIT007.13
4	Write about infrastructure enabling technology	Understand	CO 3	AIT007.13
5	Write about RVWS design in detail	Understand	CO 3	AIT007.13
6	List out the technologies for data security in cloud computing	Understand	CO 3	AIT007.13
7	Explain in detail about automatic and selection process	Understand	CO 3	AIT007.15
8	Discuss in detail about Aneka Cloud Platform	Understand	CO 3	AIT007.15
9	Explain in detail about hybrid cloud implementation.	Understand	CO 3	AIT007.15
10	Discuss the Capacity Management to meet SLA Commitments.	Understand	CO 3	AIT007.11

	UNIT -IV			
CLOUD PROGRAMMING AND SOFTWARE ENVIRONMENTS				
Part – A (Short Answer Questions)				
1	List the important Cloud Platform Capabilities	Remember	CO 4	AIT007.16
2	List the various Infrastructure cloud features	Remember	CO 4	AIT007.16
3	What are the various Platform features supported by Clouds	Remember	CO 4	AIT007.16
4	Define Queuing services	Remember	CO 4	AIT007.16
5	Define a parallel and distributed program.	Understand	CO 4	AIT007.16
6	List out the system issues for running a typical parallel program in either a parallel or a distributed manner.	Remember	CO 4	AIT007.16
7	What is Hadoop?	Understand	CO 4	AIT007.16
8	What are the two runtime software environments developed by Microsoft?	Understand	CO 4	AIT007.16
9	Expand GAE and GFS.	Understand	CO 4	AIT007.16
10	List out the technical benefits of cloud computing	Understand	CO 4	AIT007.16
Part – B (Long Answer Questions)				
1	What are the several advantages of MapReduce over traditional implementations for many task problems?	Understand	CO 4	AIT007.16
2	Discuss in detail the system issues for running a typical parallel program in either a parallel or a distributed manner.	Understand	CO 4	AIT007.16
3	Discuss in detail about MapReduce framework.	Understand	CO 4	AIT007.16
4	Explain about the architecture of MapReduce in Hadoop	Understand	CO 4	AIT007.16
5	Explain about Data flow in running a MapReduce job at various task trackers using the Hadoop library.	Understand	CO 4	AIT007.16
6	Discuss about Dryad and DryadLINQ environments from Microsoft	Understand	CO 4	AIT007.16
7	Explain in detail the Mapping Applications to Parallel and Distributed Systems	Understand	CO 4	AIT007.16
8	Discuss in detail the Programming environment for Google AppEngine with a neat sketch.	Understand	CO 4	AIT007.16
9	Describe the Architecture of Google File System (GFS).	Understand	CO 4	AIT007.16
10	Discuss Data mutation sequence in GFS with a neat sketch.	Understand	CO 4	AIT007.16
11	How Programming is implemented on Amazon EC2? Explain with neat sketch and tables.	Understand	CO 4	AIT007.19
12	Explain about Amazon Simple Storage Service (S3)	Understand	CO 4	AIT007.16
13	Write short notes on i. Amazon Elastic Block Store (EBS) ii. SimpleDB	Understand	CO 4	AIT007.16
14	Explain the features of the Azure cloud platform with a neat sketch.	Understand	CO 4	AIT007.16
15	Discuss in detail about SQLAzure's i. Azure Tables ii. SQLAzure Data Services	Understand	CO 4	AIT007.16
Part – C (Problem Solving and Critical Thinking)				
1	Explain the Eucalyptus architecture for VM image management with neat sketch	Understand	CO 4	AIT007.16
2	Explain Nimbus cloud infrastructure with neat sketch	Understand	CO 4	AIT007.16
3	Explain about OpenNebula architecture and its main components with neat sketch.	Understand	CO 4	AIT007.16
4	Explain the Sector/Sphere system architecture with neat sketch.	Understand	CO 4	AIT007.16
5	Explain about OpenStack Nova system architecture with neat sketch.	Understand	CO 4	AIT007.19
6	Discuss the Architecture and components of Aneka with neat sketch.	Understand	CO 4	AIT007.19
7	What are the three types of capabilities offered by Aneka which are essential for clouds and their applications	Understand	CO 4	AIT007.20
	CLOUD RESOURCE MANAGEMENT AND SCHEDULING			
Part - A (Short Answer Questions)				
1	Define cloud policy.	Understand	CO 5	AIT007.21
2	Define cloud mechanism.	Remember	CO 5	AIT007.22
3	List various Cloud resource management (CRM) policies.	Understand	CO 5	AIT007.21
4	What is admission control?	Remember	CO 5	AIT007.21
5	What is capacity allocation?	Remember	CO 5	AIT007.21
6	Define load balancing.	Remember	CO 5	AIT007.22
7	List the mechanisms for the implementation of resource management policies.	Understand	CO 5	AIT007.22
8	Draw the structure of cloud controller	Understand	CO 5	AIT007.21
9	Draw the structure of a two-level cloud controller	Understand	CO 5	AIT007.21
10	List out cloud scheduling algorithms for best effort applications	Understand	CO 5	AIT007.22
Part - B (Long Answer Questions)				

1	Explain in detail about cloud resource management (CRM) policies.	Understand	CO 5	AIT007.21
2	Explain in detail the mechanisms for the implementation of cloud resource management policies.	Understand	CO 5	AIT007.21
3	Discuss the structure of a cloud controller with neat sketch.	Understand	CO 5	AIT007.21
4	Discuss the structure of a two-level cloud controller.	Understand	CO 5	AIT007.21
5	Explain about the utility-based model for cloud-based web services.	Understand	CO 5	AIT007.22
6	Discuss in detail about Resource bundling combinatorial auctions in cloud computing.	Understand	CO 5	AIT007.22
7	What are the desirable properties of a pricing algorithm? Explain.	Understand	CO 5	AIT007.21
8	Discuss in detail about Start-time fair queuing.	Understand	CO 5	AIT007.21
9	Explain in detail about Borrowed virtual time in cloud computing.	Understand	CO 5	AIT007.21
10	Discuss in detail about Cloud scheduling subject to deadlines	Understand	CO 5	AIT007.21
11	Discuss in detail about various scheduling algorithms in cloud computing.	Understand	CO 5	AIT007.22
12	Explain about the applications of control theory to cloud resource allocation	Understand	CO 5	AIT007.22
Part – C (Problem Solving and Critical Thinking)				
1	Write about a need for cloud mashups	Understand	CO 5	AIT007.21
2	Write about cloud contracting models	Understand	CO 5	AIT007.22
3	Write about quality of service and value composition	Understand	CO 5	AIT007.21
4	Explain about common change management models (CMMM)	Understand	CO 5	AIT007.22
5	Explain about common change management models	Understand	CO 5	AIT007.23
6	Explain about a framework to comprehend the competitive environment	Understand	CO 5	AIT007.23

Prepared by:
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