INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)
Dundigal, Hyderabad -500 043

COMPUTER SCIENCE AND ENGINEERING

TUTORIAL QUESTION BANK

Course Title	**CLOUD APPLICATION DEVELOPMENT**				
Course Code	ACS011				
Programme	B.Tech				
Semester	VII	CSE			
Course Type	Core				
Regulation	IARE - R16				
Course Structure	Theory			Practical	
	Lectures	Tutorials	Credits	Laboratory	Credits
	3	1	4	3	2
Chief Coordinator	Dr. D Kishore Babu, Associate Professor				
Course Faculty	Mr. P Anjaiah, Assistant Professor Mr. C Praveen Kumar, Assistant Professor Ms. B Vijaya Durga, 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:

CO 1	Understand the concept of cloud computing and challenges
CO 2	Determine the cloud models with applications
CO 3	Analyze 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):

At the end of the course the students are able to:

ACS011.01	Define cloud computing and related concepts
ACS011.02	Understand the key dimensions of the challenges of Cloud Computing
ACS011.03	Understand the cloud services of Amazon, Google, Azure online services.
ACS011.04	Develop the applications developments of Amazon web services
ACS011.05	Understand the Cloud architecture and programming model
ACS011.06	Describe the compute intensive model and date intensive model
ACS011.07	Determine the map reducing in cloud
ACS011.08	Describe the graph processing
ACS011.09	Determine programming models of pregl and other big data
ACS011.10	Understanding the cloud resource virtualization
ACS011.11	Describe the Emulation of CRV
ACS011.12	Determine the application virtualization, applying virtualization
ACS011.13	Understanding the Cloud Resource Management and Scheduling
ACS011.14	Determine cloud scheduling subject to deadlines
ACS011.15	Describe fairing
ACS011.16	Understand the resource management and application scaling
ACS011.17	Describe the Cloud Security i.e., Risks, Privacy and Privacy impacts assessments
ACS011.18	Understand the Compliance issues
ACS011.19	Determine the how standards deal with cloud services and virtualization
ACS011.20	Describe compliance for the cloud provider vs compliance for the customer.

TUTORIAL QUESTION BANK

S No	QUESTION	Blooms taxonomy level	Course Outcomes	Course Learning Outcomes (CLOs)
	UNIT - I **INTRODUCTION AND CLOUD APPLICATION DEVELOPMENT**			
	Part - A (Short Answer Questions)			
1	Define cloud computing.	Remember	CO 1	ACS011.1
2	What hat are the characteristics of cloud computing?	Understand	CO 1	ACS011.1
3	Discuss the benefits of cloud computing	Understand	CO 1	ACS011.1
4	What are the various challenges faced by cloud computing?	Understand	CO 1	ACS011.1
5	What are the various cloud service models?	Understand	CO 1	ACS011.2
6	List the various cloud deployment models.	Remember	CO 1	ACS011.1
7	Illustrate the types of cloud computing.	Remember	CO 1	ACS011.2
8	What is grid computing?	Remember	CO 1	ACS011.2
9	What is utility computing?	Remember	CO 1	ACS011.2
10	Define cluster computing?	Remember	CO 1	ACS011.2
11	List the types of cloud service providers.	Understand	CO 1	ACS011.2
12	What is Amazon web services?	Remember	CO 1	ACS011.2
13	What is Google cloud platform?	Remember	CO 1	ACS011.1
14	What is Microsoft Azure?	Remember	CO 1	ACS011.2
15	What is Open-Source cloud?	Understand	CO 1	ACS011.1
16	What is Service Level Agreement?	Understand	CO 1	ACS011.2
17	List out the various applications of cloud computing.	Understand	CO 1	ACS011.2
18	Draw the cloud computing stack	Understand	CO 1	ACS011.2
19	List various Open-Source clouds?	Remember	CO 1	ACS011.2
20	Illustrate various features of a cloud	Remember	CO 1	ACS011.2
	Part - B (Long Answer Questions)			
1	Describe cloud architecture in detail with neat sketch.	Remember	CO 1	ACS011.1
2	Define Cloud Computing. Describe characteristics, benefits, challenges of cloud computing	Understand	CO 1	ACS011.1
3	Explain in brief about various cloud service models with neat sketch.	Remember	CO 1	ACS011.2
4	Describe in detail about software as a service (SaaS) in detail.	Remember	CO 1	ACS011.2
5	Explain in detail about platform as a service (PaaS) in detail.	Understand	CO 1	ACS011.2
6	What is Infrastructure as a Service (IaaS). Explain with neat sketch.	Remember	CO 1	ACS011.2
7	List and explain various applications of cloud computing.	Understand	CO 1	ACS011.2
8	List and explain the various cloud deployment models with neat diagram.	Understand	CO 1	ACS011.1
9	What is Public cloud? Explain the benefits and disadvantages of public cloud.	Understand	CO 1	ACS011.1
10	What is Private cloud? Explain the advantages and disadvantages of public cloud.	Remember	CO 1	ACS011.1
11	Discuss Hybrid cloud and explain the advantages and disadvantages of Hybrid cloud.	Understand	CO 1	ACS011.1
12	Describe the Community cloud and explain the advantages and disadvantages of Community cloud?	Remember	CO 1	ACS011.2
13	What are the technologies working behind the cloud computing platforms making cloud computing flexible, reliable, and usable?	Remember	CO 1	ACS011.2

14	Discuss Identity as a Service (IDaaS) in detail with neat sketch?	Understand	CO 1	ACS011.2
15	What is Network as a Service (NaaS)? Explain in detail with neat sketch.	Remember	CO 1	ACS011.2
16	Describe the Public cloud, Private cloud and Hybrid cloud with an example		CO 1	ACS011.1
17	List the Applications of cloud computing		CO 1	ACS011.1
18	Explain in detail about Amazon		CO 1	ACS011.2
19	Describe in detail about Healthcare in cloud computing		CO 1	ACS011.2
20	What is SLA? Explain with an example		CO 1	ACS011.2
Part – C (Problem Solving and Critical Thinking Questions)				
1	Do you believe that the homogeneity of large-scale distributed systems is an advantage? Discuss the reasons for your answer. What aspects of hardware homogeneity are the most relevant in your view, and why? What aspects of software homogeneity do you believe are the most relevant, and why?	Remember	CO 1	ACS011.2
2	Peer-to-peer systems and clouds share a few goals but not the means to accomplish them. Compare the two classes of systems in terms of architecture, resource management, scope, and security.	Understand	CO 1	ACS011.2
3	Compare the three cloud computing delivery models, SaaS, PaaS, and IaaS, from the point of view of application developers and users. Discuss the security and the reliability of each model. Analyze the differences between PaaS and IaaS	Remember	CO 1	ACS011.2
4	Over provisioning is the reliance on extra capacity to satisfy the needs of a large community of users when the average-to-peak resource demand ratio is very high. Give an example of a large-scale system using over provisioning and discuss whether over provisioning is sustainable in that case and what its limitations are. Is cloud elasticity based on over provisioning sustainable? Give arguments to support your answer	Understand	CO 1	ACS011.2
5	Discuss the possible solution for stabilizing cloud services mentioned in inspired by BGP (Border Gateway Protocol) routing	Remember	CO 1	ACS011.2
6	An organization debating whether to install a private cloud or to use a public cloud (e.g., the AWS) for its computational and storage needs asks for your advice. What information will you require to come to your recommendation, and how will you use each one of the following items? (a) The description of the algorithms and the type of the applications the organization will run; (b) the system software used by these applications; © the resources needed by each application; (d) the size of the user population (e) the relative experience of the user population; and (f) the costs involved.	Remember	CO 1	ACS011.2
7	A university is debating the question in Problem 7. What will be your advice, and why? Should software licensing be an important element of the decision	Understand	CO 1	ACS011.3
8	An IT company decides to provide free access to a public cloud dedicated to higher education. Which one of the three cloud computing delivery Models, SaaS, PaaS, or IaaS, should it embrace, and why? What Applications would be most beneficial for the students? Will this solution have an impact on distance learning? Why or why not	Remember	CO 1	ACS011.2
9	Mobile devices could benefit from cloud computing; explain the reasons you think that this statement is true or provide arguments supporting the contrary. Discuss several cloud applications for mobile devices, then explain which one of the three cloud computing delivery models, SaaS, PaaS, or IaaS, would be used by each one of the applications and why.	Remember	CO 1	ACS011.3
10	An increasing number of organizations in industry and business sectors adopt cloud systems. Answer the questions regarding cloud computing	Understand	CO 1	ACS011.3

UNIT – II CLOUD ARCHITECTURE, PROGRAMMING MODEL				
Part – A (Short Answer Questions)				
1	What is NIST model in cloud computing	Remember	CO 2	ACS011.4
2	What is the cloud computing reference architecture	Remember	CO 2	ACS011.3
3	Explain what is the use of defining cloud architecture	Understand	CO 2	ACS011.3
4	What is the 3 tier architecture	Remember	CO 2	ACS011.3
5	What is multi tier application architecture	Remember	CO 2	ACS011.3
6	What are the advantages of cloud architecture	Remember	CO 2	ACS011.3
7	What is the business benefits involved in cloud Architecture	Understand	CO 2	ACS011.3
8	Explain how does the Quality of service is being maintained in the cloud architecture	Understand	CO 2	ACS011.3
9	What are the different roles defined by cloud architecture	Remember	CO 2	ACS011.3
10	Explain what are the major building blocks of cloud architecture	Remember	CO 2	ACS011.3
11	Explain Infrastructure as a service	Remember	CO 2	ACS011.3
12	Explain Platform as a service	Understand	CO 2	ACS011.4
13	Explain Software as a service	Understand	CO 2	ACS011.4
14	What are the different components required by cloud architecture	Remember	CO 2	ACS011.4
15	What are the different phases involves in cloud architecture	Remember	CO 2	ACS011.4
16	What is the relationship between SOA and cloud architecture	Understand	CO 2	ACS011.4
17	What are the different cloud service models in cloud architecture	Understand	CO 2	ACS011.4
18	What are the building blocks in Cloud Computing Architecture	Remember	CO 2	ACS011.4
19	What is meant by Single-site architecture	Remember	CO 2	ACS011.4
20	What is redundant and non redundant in cloud computing	Understand	CO 2	ACS011.4
Part - B (Long Answer Questions)				
1	Explain about multi-cloud versus hybrid cloud and show the	Understand	CO 2	ACS011.3
2	Explain the difference between vertical scale up and Horizontal scale out	Remember	CO 2	ACS011.4
3	Mention the basic difference between Non-redundant three - tier architectures and Redundant three-tier architectures	Remember	CO 2	ACS011.4
4	Explain about the challenges for cloud computing	Understand	CO 2	ACS011.4
5	What is data intensive computing? explain about parallel computing architecture	Understand	CO 2	ACS011.3
6	What is the difference between distributed computing and parallel computing	Understand	CO 2	ACS011.3
7	Explain the features of Apache zookeeper and Benefits of Apache Zookeeper	Remember	CO 2	ACS011.4
8	Write about the Various architectural styles for cloud applications.	Remember	CO 2	ACS011.4
9	What is data intensive computing? And explain about parallel computing architecture	Remember	CO 2	ACS011.3
10	What are the three differences that separate out cloud architecture from the tradition one	Understand	CO 2	ACS011.4
11	How does cloud architecture overcome the difficulties faced by traditional architecture?	Remember	CO 2	ACS011.3
12	How does cloud architecture provide performance transparency and automation	Understand	CO 2	ACS011.4
13	Describe the advantages of three tier architecture over 2 tier architecture?	Understand	CO 2	ACS011.4
14	Explain about the cloud computing infrastructure for data intensive applications	Understand	CO 2	ACS011.4
15	What is the difference between single, multi, hybrid cloud site	Remember	CO 2	ACS011.3

16	Explain the multi tier architectures with an example	Understand	CO 2	ACS011.4
17	Explain about the architectural styles of cloud applications with an example	Remember	CO 2	ACS011.3
18	What is data intensive?	Understand	CO 2	ACS011.4
19	Explain the hybrid cloud site	Remember	CO 2	ACS011.3
20	Explain the programming model	Understand	CO 2	ACS011.4
	Part – C (Problem Solving and Critical Thinking)			
1	How basic cloud architecture looks like? And write tips for managing your multi-cloud environment with and real time example?	Understand	CO 2	ACS011.4
2	Deploying a multi-tenant application across multiple cloud platforms can be very challenging. Explain the solution by using 6 multi-cloud architecture designs for an effective cloud strategy	Remember	CO 2	ACS011.4
3	Write a case study on how-to: use apache zookeeper to build distributed apps and describe how Zookeeper works	Understand	CO 2	ACS011.4
4	Write a case study on Hadoop distributed file system used in cloud Computing.	Remember	CO 2	ACS011.4
5	Explain the how the Zookeeper works in A Real World environment with example.	Understand	CO 2	ACS011.4
6	This problem refers to the redundancy technique. Assume that when a node fails, it takes 10 seconds to diagnose the fault and another 30 seconds for the workload to be switched over.	Remember	CO 2	ACS011.4
7	Assume a sequential computer has 512 MB of main memory and enough disk space. The disk read/write bandwidth for a large data block is 1 MB/second	Remember	CO 2	ACS011.4
8	Compare the latest Top 500 list with the Top 500 Green List of HPC systems. Discuss a few top winners and losers in terms of energy efficiency in power and cooling costs. Reveal the green energy winners' stories and report their special design features, packaging, cooling, and management Policies that make them the winners. How different are the ranking orders in the two lists? Discuss their causes and implications based on publicly reported data	Understand	CO 2	ACS011.4
9	This problem is related to the use of MOSIX for cluster computing. Check with the open literature on current features that have been claimed by designers and developers in supporting Linux clusters, GPU clusters, multiclusters, and even virtualized clouds. Discuss the advantages and shortcomings from the user's perspective.	Remember	CO 2	ACS011.4
10	Assume that each server has an MTTF of 200 days and an MTTR of five days. The disk has an MTTF of 800 days and an MTTR of 20 days. In addition, each server is shut down for maintenance for one day every week, during which time that server is considered unavailable. Only one server is shut down for maintenance at a time. The failure rates cover both natural failures and scheduled maintenance. The SCSI bus has a failure rate of 2 percent. The servers and the disk fail independently. The disk and SCSI bus have no scheduled shutdown. The client machine will never fail	Understand	CO 2	ACS011.4
	UNIT-III **CLOUD RESOURCE VIRTUALIZATION**			
	Part - A (Short Answer Questions)			
1	What is Cloud resource virtualization	Remember	CO 3	ACS011.5
2	Define virtualization	Understand	CO 3	ACS011.5
3	What is the need of virtualization	Understand	CO 3	ACS011.5
4	Write a note on virtual machine stored	Understand	CO 3	ACS011.5

5	What are the 3 types of virtualization techniques	Understand	CO 3	ACS011.5
6	How can we create virtualization	Understand	CO 3	ACS011.5
7	What are the advantages and disadvantages of using a virtual machine?	Remember	CO 3	ACS011.5
8	What is difference between cloud and virtualization?	Remember	CO 3	ACS011.5
9	What are the functions of cloud computing possible without Virtualization?	Understand	CO 3	ACS011.5
10	What is virtualization CPU?	Remember	CO 3	ACS011.5
11	How can we install Hyper V on a virtual machine?	Understand	CO 3	ACS011.5
12	What is a virtual machine and how does it work	Understand	CO 3	ACS011.5
13	State the benefits of using binary translation in cloud computing?	Understand	CO 3	ACS011.5
14	What is platform virtualization	Remember	CO 3	ACS011.6
15	How can you generate Web application	Remember	CO 3	ACS011.6
16	What is Network Virtualization	Understand	CO 3	ACS011.5
17	How Virtual Machines work	Remember	CO 3	ACS011.5
18	List common methods for primary function	Remember	CO 3	ACS011.6
19	Define VM for x86	Understand	CO 3	ACS011.6
20	How hypervisor plays an important role in cloud computing	Understand	CO 3	ACS011.5
Part – B (Long Answer Questions)				
1	Explain briefly about Cloud resource virtualization?	Understand	CO 3	ACS011.5
2	Describe virtualization? Types of virtualization techniques?	Remember	CO 3	ACS011.5
3	Define virtual machine monitor? and hypervisor - virtual machine basics?	Remember	CO 3	ACS011.6
4	Explain briefly about desktop and application virtualization?	Understand	CO 3	ACS011.6
5	Explain how process vs system virtual machines?	Remember	CO 3	ACS011.6
6	Explain briefly about desktop and application?	Understand	CO 3	ACS011.6
7	Describe basics of virtual machine	Remember	CO 3	ACS011.6
8	Define process in cloud computing	Remember	CO 3	ACS011.6
9	Explain system virtual machines	Understand	CO 3	ACS011.5
10	Explain Para virtualization ideal? Explain full virtualization?	Understand	CO 3	ACS011.6
11	Explain with an example to generate the intermediate code for the flow of control statements?	Remember	CO 3	ACS011.6
12	Describe the difference between full virtualization and Paravirtualization	Understand	CO 3	ACS011.6
13	Explain translation for VM host?	Understand	CO 3	ACS011.6
14	Write about virtual machine and how does it work?	Understand	CO 3	ACS011.6
15	Explain the binary translation in virtualization?	Remember	CO 3	ACS011.5
16	Explain briefly syntax and features of high level language?	Remember	CO 3	ACS011.6
17	Explain trusted virtual machine monitor	Remember	CO 3	ACS011.6
18	Describe Hardware virtual machine	Understand	CO 3	ACS011.5
19	Write about Para virtual machine	Remember	CO 3	ACS011.6
20	Explain Virtual machine security	Understand	CO 3	ACS011.5
Part – C (Problem Solving and Critical Thinking)				
1	Discuss Virtualization Middleware for Scientific Cloud Computing in Open Source Offerings, Do we have to think of consciousness from metaphysical perspective	Understand	CO 3	ACS011.6
2	Identify a hybrid cloud allows a company to maintain critical, confidential data and money on the new resources	Remember	CO 3	ACS011.6

3	The VMs practically share all resources of the virtual infrastructure including virtual switch	Understand	CO 3	ACS011.6
4	Identify the milestones in the evolution of operating systems during the half century from 1960 to 2010 and comment on this statement from [308]: "VMMs give operating system developers another opportunity to develop functionality no longer practical in today's complex and ossified operating systems, where innovation moves at a geologic pace	Understand	CO 3	ACS011.6
5	several operating systems, including Linux, Minix, NetBSD,FreeBSD, NetWare, and OZONE, can operate as paravirtualized Xen guest operating systems running on x86, x86-64, Itanium, and ARM architectures, whereas VMware EX Server supports full virtualization of x86 architecture. Analyze how VMware provides the functions.	Understand	CO 3	ACS011.6
6	Discuss Virtualization simplifies the use of resources, isolates users from one another, and supports replication and mobility, but exacts a price in terms of performance and cost. Analyze each one of these aspects for (i) memory virtualization, (ii) processor virtualization, and(iii) virtualization of a communication channel	Remember	CO 3	ACS011.6
7	Explain about Virtualization of the processor combined with virtual Memory management poses multiple challenges. Analyze the interaction of interrupt handling and paging	Understand	CO 3	ACS011.6
8	Describe the approaches used to exchange data among the domains of Xen and design experiments to compare the performance of data communication between the domains. This is designed to familiarize you with the Xen programming environment. It may require a longer period of time to port the Xen code, implement the application code, perform the experiments, collect the performance data, and interpret the results	Understand	CO 3	ACS011.6
9	Design an experiment to analyze the performance of Xen live migration for I/O read-intensive applications. The performance merits include the time consumed by the precopy phase, the downtime, the time used by the pull phase, and the total migration time.	Remember	CO 3	ACS011.6
10	Design a large-scale virtual cluster system. This problem may require three students to work together for a semester. Assume that users can create multiple VMs at one time. Users can also manipulate and configure multiple VMs at the same time. Common software such as OS or libraries are preinstalled as templates. These templates enable users to create a new execution environment rapidly. Finally, you can assume that users have their own profiles which store the identification of data blocks	Understand	CO 3	ACS011.6
	UNIT-IV **CLOUD RESOURCE MANAGEMENT AND SCHEDULING** **Part – A (Short Answer Questions)**			
1	Write about fair queuing.	Remember	CO 4	ACS011.7
2	Define Resource bundling	Understand	CO 4	ACS011.7
3	Distinguish hard deadlines from soft deadlines	Remember	CO 4	ACS011.7
4	What is the meaning of Mapping a computation?	Remember	CO 4	ACS011.7
5	Define Elasticity	Understand	CO 4	ACS011.7
6	Draw a two-level control architecture	Remember	CO 4	ACS011.7
7	What is Scalability?	Understand	CO 4	ACS011.7
8	What does Map Reduce mean?	Remember	CO 4	ACS011.7
9	What is scaling mode of resource management	Understand	CO 4	ACS011.8
10	List out the Scheduling Policies.	Understand	CO 4	ACS011.7
11	Define context switch allowance.	Remember	CO 4	ACS011.8
12	What is Scaling	Understand	CO 4	ACS011.7
13	What is the need of scheduling among clouds?	Understand	CO 4	ACS011.7

14	Define scheduling in cloud	Remember	CO 4	ACS011.8
15	Distinguish between Policies and mechanisms	Remember	CO 4	ACS011.9
16	What is borrowed virtual time	Remember	CO 4	ACS011.7
17	Why we need deadlines for cloud scheduling	Understand	CO 4	ACS011.8
18	What is the map reduce	Understand	CO 4	ACS011.7
19	How resource management will affect the cloud	Remember	CO 4	ACS011.8
20	What is resource bundling	Remember	CO 4	ACS011.7
Part – B (Long Answer Questions)				
1	Explain Policies and mechanisms for resource management	Remember	CO 4	ACS011.7
2	Explain in detail about Resource bundling.	Remember	CO 4	ACS011.7
3	Write about Borrowed virtual time.	Understand	CO 4	ACS011.8
4	Explain Fair queuing with an example	Remember	CO 4	ACS011.9
5	Write about Cloud scheduling subject to deadlines.	Remember	CO 4	ACS011.10
6	Explain in detail about Scheduling Map Reduce	Remember	CO 4	ACS011.8
7	Write about Resource management.	Understand	CO 4	ACS011.10
8	Explain about dynamic application scaling	Understand	CO 4	ACS011.9
9	Discuss various applications subject to deadlines.	Remember	CO 4	ACS011.7
10	Distinguish between fair queuing and start time fair queuing	Understand	CO 4	ACS011.7
11	Discuss in detail about combinatorial	Remember	CO 4	ACS011.7
12	Explain in detail about application scaling.	Understand	CO 4	ACS011.8
13	Discuss resource Management and Dynamic Application Scaling	Understand	CO 4	ACS011.7
14	Explain in detail about combinatorial Auctions for Cloud Resources	Remember	CO 4	ACS011.7
15	Write about Stability of a Two-Level Resource Allocation Architecture	Understand	CO 4	ACS011.7
16	Discuss Scheduling Algorithms for Computing Clouds	Remember	CO 4	ACS011.7
17	Explain in detail about Scheduling in cloud computing	Understand	CO 4	ACS011.8
18	Explain in detail about Cloud scheduling subject to deadlines	Understand	CO 4	ACS011.7
19	Write about Task Characterization and Deadlines	Remember	CO 4	ACS011.7
20	Explain in detail about scheduling algorithm	Understand	CO 4	ACS011.7
Part – C (Problem Solving and Critical Thinking)				
1	Analyze the benefits and the problems posed by the four approaches to the implementation of resource management policies: control theory, machine learning, utility-based, and market-oriented	Remember	CO 4	ACS011.9
2	Can optimal strategies for the five classes of policy – admission control, Capacity allocation, load balancing, energy optimization, and QoS guarantees – be actually implemented in a cloud? The term optimal is used in the sense of control theory. Support your answer with solid arguments. optimal strategies for one could be in conflict with optimal strategies for one or more of the other classes. Identify and analyze such cases	Understand	CO 4	ACS011.10
3	Analyze the relationship between the scale of a system and the policies and the mechanisms for resource management. In your arguments, consider also the geographic scale of the system..	Remember	CO 4	ACS011.10
4	Multiple controllers are probably necessary due to the scale of a cloud. Is it beneficial to have system and application controllers? Should the controllers be specialized – for example, some to monitor performance, others to monitor power consumption? Should all the functions we want to base the resource management policies on be integrated in a single controller and one such controller be assigned to a given number of servers or a Geographic region? Justify your answers.	Understand	CO 4	ACS011.9
5	Consider the workflow for your favorite cloud application. Use XML to describe this workflow, including the instances and the storage required for each task.	Remember	CO 4	ACS011.10

6	Use the start-time fair queuing (SFQ) scheduling algorithm to compute the virtual start-up and the virtual finish time for two threads *a* and *b* with weights *wa* = 1 and *wb* = 5 when the time quantum is *q* = 15 and thread *b* blocks at time *t* = 24 and wakes up at time *t* = 60. Plot the virtual time of the scheduler function of the real time.	Understand	CO 4	ACS011.10
7	Multiple controllers are probably necessary due to the scale of a cloud. Is it beneficial to have system and application controllers? Should the controllers be specialized – for example, some to monitor performance, others to monitor power consumption? Should all the functions we want to base the resource management policies on be integrated in a single controller and one such controller is assigned to a given number of servers or a geographic region? Justify your answers	Remember	CO 4	ACS011.10
8	In a scale-free network, the nodes have an exponential degree distribution A scale-free network could be used as a virtual network infrastructure for cloud computing. Controllers represent a dedicated class of nodes tasked with resource management. In a scale-free network, nodes with high connectivity can be designated as controllers. Analyze the potential benefit of such a strategy.	Understand	CO 4	ACS011.10
9	How can we set up Hadoop-YARN cluster with ports to start each worker? Is there any configuration file where you can specify the port number too(other than the IP address).	Remember	CO 4	ACS011.10
10	Intel and HP announced that the Itanium architecturewill be discontinued. Review the architecture, discussed in Section 5.10, and identify several possible reasons for this decision.	Understand	CO 4	ACS011.10
	UNIT-V **CLOUD SECURITY**			
	Part - A (Short Answer Questions)			
1	Define Privacy Impact Assessment (PIA)	Understand	CO 5	ACS011.11
2	Draw a neat sketch of Virtual security services provided by the VMM.	Remember	CO 5	ACS011.11
3	Draw a neat sketch of dedicated security VM.	Remember	CO 5	ACS011.11
4	Define trusted applications.	Understand	CO 5	ACS011.11
5	What is cloud Security	Understand	CO 5	ACS011.11
6	Distinguish between privacy and privacy impacts assessments	Understand	CO 5	ACS011.12
7	What are multi-tenancy issues	Understand	CO 5	ACS011.12
8	Write a brief note on security in VM	Remember	CO 5	ACS011.11
9	List the various cloud security issues	Remember	CO 5	ACS011.11
10	List various virtualization system-specific attacks	Understand	CO 5	ACS011.11
11	Write a brief note on Cloud security risks	Understand	CO 5	ACS011.12
12	What is Data loss or leakage	Understand	CO 5	ACS011.12
13	What is Account or service hijacking	Remember	CO 5	ACS011.11
14	Write a brief note on privacy	Remember	CO 5	ACS011.11
15	Write a brief note Trust	Understand	CO 5	ACS011.12
16	What is calculus-based trust	Understand	CO 5	ACS011.12
17	What is trusted applications	Remember	CO 5	ACS011.11
18	Write a brief note on Amazon Machine Images	Remember	CO 5	ACS011.11
19	Write a brief note open-box platforms	Understand	CO 5	ACS011.12
20	Write a brief note mandatory security	Remember	CO 5	ACS011.11
	Part - B (Long Answer Questions)			
1	Explain about a Cloud Security.	Understand	CO 5	ACS011.11
2	Explain about Security in OS.	Understand	CO 5	ACS011.12
3	Write about virtualization system security issues.	Understand	CO 5	ACS011.12

4	How standards deal with cloud services and virtualization.	Remember	CO 5	ACS011.11
5	Explain about Virtualization system-specific attacks.	Remember	CO 5	ACS011.11
6	Explain cloud Security	Understand	CO 5	ACS011.11
7	Describe virtualization system security issues and vulnerabilities	Understand	CO 5	ACS011.12
8	Explain about technologies for virtualization-based security enhancement	Understand	CO 5	ACS011.12
9	Explain about legal issues in cloud security	Remember	CO 5	ACS011.11
10	Explain in detail about Security of virtualization	Understand	CO 5	ACS011.12
11	Describe Virtual machine security	Understand	CO 5	ACS011.12
12	Write about Operating system security	Remember	CO 5	ACS011.11
13	Explain in detail about Trust	Remember	CO 5	ACS011.11
14	Describe Privacy and privacy impact assessment	Understand	CO 5	ACS011.12
15	Surfaces of attacks in a cloud computing environment	Understand	CO 5	ACS011.12
16	Explain in detail about Cloud security risks	Remember	CO 5	ACS011.11
17	Describe Virtual security services provided by the VMM.	Remember	CO 5	ACS011.11
18	Explain in detail about A dedicated security VM	Understand	CO 5	ACS011.12
19	Distinguish between VMM-based threats and VM-based threats	Remember	CO 5	ACS011.11
20	Justify Security: The top concern for cloud users	Remember	CO 5	ACS011.11
Part – C (Problem Solving and Critical Thinking)				
1	Identify the main security threats for the SaaS cloud delivery model on a Public cloud. Discuss the different aspects of these threats on a public cloud vis-à-vis the threats posed to similar services provided by a traditional service-oriented architecture running on a private infrastructure	Understand	CO 5	ACS011.11
2	Analyze Amazon's privacy policies and design a service-level agreement You would sign if you were to process confidential data using AWS.	Understand	CO 5	ACS011.11
3	Analyze the implications of the lack of trusted paths in commodity operating systems and give one or more examples showing the effects of this deficiency. Analyze the implications of the two-level security model of commodity operating systems	Understand	CO 5	ACS011.12
4	Compare the benefits and the potential problems due to virtualization on public, private, and hybrid clouds	Remember	CO 5	ACS011.12
5	Analyze how the six attack surfaces are illustrated. Apply to the SaaS, PaaS, and IaaS cloud delivery models	Understand	CO 5	ACS011.12
6	Discuss the impact of international agreements regarding privacy laws on cloud computing.	Understand	CO 5	ACS011.11
7	Discuss the measures taken by Amazon to address the problemsposed by Shared images available from *AWS*. Would it be useful to have a cloud service to analyze images and sign them before being listed and made available to the general public?	Understand	CO 5	ACS011.11
8	Analyze the risks posed by foreign mapping and the solution adopted by Xoar. What is the security risk posed by XenStore?	Understand	CO 5	ACS011.12
9	Consider a program for multiplying two large-scale N × N matrices, where N is the matrix size. The sequential multiply time on a single server is T1 = cN3 minutes, where c is a constant determined by the server used. An MPI-code parallel program requires Tn = cN3/n + dN2/n0.5 minutes to complete execution on an n-server cluster system, where d is a constant determined by the MPI version used.Assume the program has a zero sequential bottleneck ($\alpha = 0$). The second term in Tn accounts for the total message-passing overhead experienced by n servers	Remember	CO 5	ACS011.12
10	Consider a multicore processor with four heterogeneous cores labeled A, B, C, and D. Assume cores A and D have the same speed. Core B	Understand	CO 5	ACS011.12

	runs twice as fast as core A, and core C runs three times faster than core A. Assume that all four cores start executing the following application at the same time and no cache misses are encountered in all core operations. Suppose an application needs to compute the square of each element of an array of 256 elements. Assume 1 unit time for core A or D to compute the square of an element. Thus, core B takes 12 unit time and core C takes 13 unit time to compute the square of an element. Given the following division of labor in four cores: Core A 32 elements Core B 128 elements Core C 64 elements Core D 32 elements			

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