SRM INSTITUTE OF SCIENCE AND TECHNOLOGY

Ramapuram Campus, Bharathi Salai, Ramapuram, Chennai - 600089

COLLEGE OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

QUESTION BANK

DEGREE / BRANCH: B.TECH/CSE

V SEMESTER

SUB CODE /SUBJECT NAME
18CSE360T/INFORMATION STORAGE MANAGEMENT

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Academic Year 2023-2024-ODD

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INFORMATION STORAGE AND MANAGEMENT

SEM/ YEAR : V / III

Course Outcomes

CO1: Acquire the knowledge on the components of storage infrastructure.

CO2: Acquire the ability to evaluate storage architectures including storage subsystems

CO3: Understand the business continuity, backup and recovery methods.

CO4: Appreciate the concepts of storage security and information security applied to virtual machine

CO5: Apply the knowledge for storage infrastructure

CO6: Acquire the knowledge on structure of cloud computing and its techniques

UNIT I

Introduction to Information Storage Management- Evolution of Storage Architecture- Data Centre Infrastructure- Virtualization and Cloud Computing- Key challenges in managing information.- Data Center Environment: Application- Database Management System (DBMS) - Host : Connectivity, Storage- Disk Drive Components,Disk Drive Performance- Intelligent Storage System - Components of an Intelligent Storage System- Storage Provisioning- Types of Intelligent Storage Systems- Creation of Virtual storage machine , Navigation of storage system .

PART-A (Multiple Choice Questions)

Q. No	Questions	Course Outcome	Competence BT Level
1	Data is collection of **a) Raw facts** **b)** Information **c)** Knowledge **d)** Refined decision	CLO1	Remember
2	Data can be a) **Handwritten letters**, b) Graph c) a power presentation d) A document	CLO1	Remember

3	Businesses analyze raw data in order to identify meaningful trends ,On the basis of these trends, **a) A company can plan or modify its strategy.** **b)** A company can only plan strategy **c)** A company can only modify its strategy. **d)** Document the strategy for further use	CLO1	Understand
4	Information is **a) the intelligence and knowledge derived from data** **b)** intelligence derived from data **c)** knowledge derived from data **d)** Decision derived from data	CLO1	Remember
5	The time required for the read / write heads in a disk drive to move between tracks of the disk is called **a) seek time or access time** **b)** rotational latency **c)** data transfer rate **d)** service time	CLO1	Understand
6	Data is organized in rows and columns in a rigidly defined format is **a) Structured data** **b)** Unstructured data **c)** Semi- Structured data **d)** Raw data	CLO1	Remember
7	Pick the Unstructured data a) Documentation **b) e-mail messages** c) Files d) PowerPoint presentation	CLO1	Understand
8	Analyzing big data in real time requires new techniques such as a) **massively parallel processing (MPP) data platforms** b) Massively serial processing data Platforms c) Pipelined data platform d) Non Pipelined data platform	CLO1	Analyze
9	The Software provides a structured way to store data in logically organized tables that are interrelated. **a) Database management system** **b)** Data platform processing system **c)** Data warehouse **d)** Database	CLO1	Remember
10	Business growth often requires deploying more servers, new applications, and additional databases is named as **a) Scalability** **b)** Availability **c)** Data integrity		

	d) Manageability	CLO1	Understand
11	Data is stored and retrieved exactly as it was received is a) Scalability b) Availability **c) Data integrity** d) Manageability	CLO1	Understand
12	A technique of abstracting physical resources, such as compute, storage, and network, and making them appear as logical resources. **a) Virtualization** **b)** Abstraction **c)** Encapsulation **d)** Parameter passing	CLO1	Understand
13	A computer program that provides the logic for computing operations are **a) Application** **b)** Database **c)** OS **d)** Mother board	CLO1	Understand
14	The virtual-to-physical memory mapping is carried out by **a) VMM** **b)** Processor **c)** OS **d)** ALU	CLO1	Remember
15	The space used by the VMM on the disk is known as **a) swap space** **b)** Empty space **c)** Unfilled space **d)** Reoccupied space	CLO1	Remember
16	The address that points to data at the disk storage. a) virtual address **b) Physical address** c) logical address d) Memory address	CLO1	Understand
17	A special software that permits the operating system to interact with a specific device, such as a printer, a mouse, or a disk drive **a) device driver** **b)** Operating system **c)** Team viewer **d)** Skype	CLO1	Remember
18	PVID is **a) physical volume identifier** **b)** physical velocity identifier **c)** physical variability identifier **d)** physical	CLO1	Understan

	volume identification		d
19	The environment consists of the superblock, the nodes, and the list of data blocks free and in use as metadata is **a) Unix** **b)** Linux **c)** Windows **d)** Safari	CLO1	Analyze
20	In a file system, the smallest "unit" allocated for storing data **a) Block** **b)** Bit **c)** Character **d)** Literal	CLO1	Remember
21	Match the following: a) Availability- i. establish policies, procedures, and core element integration to prevent unauthorized access to information b) Security- ii. A data center should ensure the information c) Scalability- iii. implementing error correction codes or parity bits mechanisms d) Data integrity- iv.deploying more servers, new applications, and additional databases. **A) a-ii,b-i,c-iv,d-iii** B) a-iii,b-I,c-iv,d-ii C) a-i,b-ii,c-iv,d-iii D) a-ii,b-Iii,c-i,d-iv	CLO1	Understand
22	Cache is volatile memory, a) A power failure or any kind of cache failure will cause loss of the data that is not yet committed to the disk. **i) cache mirroring** ii)cache vaulting iii)cache miss iv)cache hit	CLO1	Understand
23	This risk of losing uncommitted data held in cache can be mitigated using i) cache mirroring ii) **cache vaulting** iii) cache miss	CLO1	Understand

	iv) cache hit		
24	Match the Following: a) Idle flushing- i. Activated when cache utilization hits the high watermark. b) High watermark flushing- ii. Occurs in the event of a large I/O burst when cache reaches 100 percent of its capacity c) Forced Flushing-iii. when the cache utilization level is between the high and low watermark **A) a-iii,b-i,c-ii** **B)** a-iii,b-ii,c-i **C)** a-i,b-ii,c-iii **D)** a-ii,b-Iii,c-i	CLO1	Remember
25	Data is placed in cache and an acknowledgment is sent to the host immediately **i) Write-back cache** **ii)** Write-through cache **iii)** write front cache **iv)** timestamp cache	CLO1	Understand
	PART B (4 Marks)		
1	List out the factors that contributing the growth of digital data.	CLO-1	Understand
2	What are the key challenges in Managing Information? Describe the different Types of Data?	CLO-1	Remember
3	State the components that formulate the data center.	CLO-1	Remember
4	Describe the core elements of data center	CLO-1	Remember
5	State the key characteristics of a Data Center	CLO-1	Remember
6	Difference between the virtualization and Cloud computing	CLO-1	Remember
7	Define seek time, Rotational Latency and Data transfer rate.	CLO-1	Remember
8	Explain the process of mapping from user files to disk storage	CLO-1	Understand
	PART C (12 Marks)		
1	Explain briefly about the evaluation of storage technology and architecture with neat sketch	CLO-1	Understand
2	Depict in detail about data in information storage management also brief the different types of data with suitable diagram	CLO-1	Understand
3	Explain the concept of disk drive components with suitable diagram.	CLO-1	Understand
4	Write about the core elements of a data center infrastructure and also write the solutions available for data storage?	CLO-1	Understand
5	Explain about Disk Drive performance in detail.	CLO-1	Understand

UNIT II			
Virtualization and Cloud Computing: Fiber Channel: Overview -SAN and its Evolution -Components of FC SAN, FC Connectivity, FC Architecture, IPSAN-iSCSI components, iSCSI Protocol Stack iSCSI Names. NAS: General Purpose Servers versus NAS Devices, Benefits of NAS- File Systems and Network File Sharing - Components of NAS, NAS I/O Operation - NAS Implementations - NAS File Sharing Protocols - Object Based Storage Devices -Content Addressed Storage - Configuration and Tracing of FC scan and iSCSI scan.			
PART-A (Multiple Choice Questions)			
Q. No	**Questions**	**Course Outcome**	**Competence BT Level**
1	Which is an important feature of the FC networking technology? **a) High data transmission** **b)** Bandwidth **c)** Storage **d)** Low data transmission	CLO2	Remember
2	In a switched fabric, the link between any two switches is called an **a) ISL** **b)** Fabric **c)** CSL **d)** NAS	CLO2	Understand
3	What does the end devices, such as hosts, storage arrays, and tape libraries, are all referred to as in a Fibre Channel network. a) Ports **b) Nodes** c) Address d) Frame	CLO2	Analyze
4	Select the simplest FC configuration that directly connects two devices to each other. **a) Point-to-Point** b) Arbitrated loop c) Fibre Channel switched fabric d) Fibre channel	CLO2	Remember
5	FC SAN uses that provides both channel speed for data transfer with low protocol overhead and scalability of network technology. **a) Fibre Channel Protocol** **b)** Transmission control protocol **c)** File transfer protocol **d)** Hypertext transfer protocol	CLO2	Apply
6	Pick the layer gives Fibre Channel addressing, structure, and organization of data (frames, sequences, and exchanges) a) FC 1 layer **b) FC 2 layer** c) FC 3 layer d) FC 4 layer	CLO2	Remember
7	Which one is not a Fibre channel layer? a) FC 0 layer		

	b) FC 1 layer c) FC 2 layer **d) FC 3 layer**	CLO2	Understand
8	**I**dentify the frames that do not carry any user data. a) Data Frames **b) Link control frames** c) Frame control d) Type	CLO2	Analyze
9	The transmitting port maintains a count of free receiver buffers and continues to send frames if the count is **a) greater than 0** b) greater than 1 c) greater than 3 d) less than 0	CLO2	Understand
10	Which session-layer interface is responsible for handling login, authentication, target discovery, and session management? **a) iSCSI** **b)** SCSI **c)** CSI **d)** iscs	CLO2	Evaluate
11	Each device in the FC environment is assigned a 64-bit unique identifier called the **a) WWN** **b)** WWPN **c)** WWNN **d)** WWW	CLO2	Understand
12	Which one is not a common NAS implementations a) unified b) gateway c) scale-out **d) switch**	CLO2	Understand
13	Which one is not the current version of NFS a) NFS v2 b) NFS v3 c) NFS v4 **d) NFS v5**	CLO2	Remember
14	A port that forms the connection between two FC switches. This port is also known as the **a) EPort** **b)** F port **c)** N port **d)** G port	CLO2	Remember
15	Which is the uppermost layer in the FCP stack **a) FC-4** **b)** FC-0 **c)** FC-2 **d)** FC-1	CLO2	Apply

16	Choose the APIs can be easily integrated with business applications that access OSD over the web. a) REST b) SOAP **c) REST and SOAP** d) SMTP	CLO2	Remember
17	---------- enables automatic discovery of iSCSI devices on an IP network. **a) iSNS** b) SNS c) iSCI d) SCSI	CLO2	Remember
18	Which one of the following is mapping of SCSI **a) SCSI over TCP/IP** **b)** IP over SCSI **c)** FC over IP **d)** FC over TCP	CLO2	Evaluate
19	What type of access is allowed by SCSI **a) block level** **b)** file level **c)** both block and file level **d)** user level access	CLO2	Understand
20	A port that forms the connection between two FC switches. This port is also known as the **a) EPort** **b)** F port **c)** N port **d)** G port	CLO2	Understand
21	How many devices FC can support address on a network. a) More than 12 millions b) More than 10 millions c) More than 5 millions **d) More than 15 millions**	CLO2	Evaluate
22	Why should an MTU value of at least 2,500 be configured in a bridged iSCSI environment? a) FC supports frame size of 2568 byte b) FC supports frame size of 2100 byte c) FC supports frame size of 2589 byte **d) FC supports frame size of 2148 byte**	CLO2	Analyze
23	A network router has a failure rate of 0.02 percent per 1,000 hours. What is the MTBF of that component? **a) 50,00,000 hrs** b) 40,00,000 hrs c) 55,00,000 hrs d) 56,00,000 hrs	CLO2	Apply
24	Which of the following is not a valid iSCSI name? a) iqn.2001-04.com.mystorage:storage.tape1 b) iqn.2001-04.com.mystorage	CLO2	Evaluate

	c) iqn.01-04.com.example.disk c) d) iqn.2001-04.com		
25	The file naming scheme in an NFS environment is: a) Server: /export or Server.domain b) Server: /export or Server.domain.suffix c) Server: /export or Server..suffix:/export **d) Server: /export or server.domain.suffix:/export**	CLO2	Create
PART B (4 Marks)			
1	Define SAN and explain about its evolution.	CLO-2	Understand
2	Explain Components of FC SAN.	CLO-2	Remember
3	Write short notes on iSCSI Protocol Stack.	CLO-2	Remember
4	Define Object Based Storage Devices and list out its benefits.	CLO-2	Remember
5	List out benefits of NAS and explain the components of NAS	CLO-2	Remember
6	Short notes on FC Connectivity	CLO-2	Understand
7	Limitation of Fibre Channel Arbitrated Loop	CLO-2	Understand
8	Usage of different types of port in switched fabric	CLO-2	Remember
PART C (12 Marks)			
1	Explain the Object-Based Storage architecture. What are the key benefits it offers?	CLO-2	Apply
2	Explain about the components of NAS. Explain the key benefits offered by the NAS system.	CLO-2	Remember
3	Explain the Content Addressed Storage in detail.	CLO-2	Remember
4	Summarize FC Connectivity and FC Architecture in detail.	CLO-2	Remember
5	Explain the implementation of iSCSI.	CLO-2	Remember

UNIT III			
Business Continuity and Back Up Recovery: Business Continuity: Information Availability. BC Terminology, BC Planning life cycle, Failure Analysis, Business Impact Analysis, BC Technology Solutions, Backup and Archive: Backup Purpose Backup Considerations, Backup Granularity, Recovery considerations, Backup Methods, Backup Architecture, Backup and Restore Operations, Backup Topologies, Backup in NAS Environments, Backup Targets, Data Deduplication for Backup, Backup in Virtualized Environments, Sharing Files between host and Virtual Machines, Usage of Backup techniques.			
PART-A (Multiple Choice Questions)			
Q. No	**Questions**	**Course Outcome**	**Competence BT Level**
1	The main purpose of backup is: **a) To restore a computer to an operational state following a disaster** **b)** To eliminate small numbers of files after they have been		

	accidentally deleted **c)** Not to one among many version of the same file for multiple backup environment **d)** To enable the user to have additional memory	CLO3	Understand
2	Which of the following qualifies as best DR (Disaster Recovery) site? a) DR site in the same campus b) DR site in the same city c) DR site in the same country **d) DR site in a different country**	CLO3	Understand
3	Which of the following backup technique is most space efficient? a) Full backup **b) Incremental backup** c) Differential backup d) Partial backup	CLO3	Remember
4	Which of the following techniques can be used for optimizing backed up data space? a) Encryption and Deduplication **b) Compression and Deduplication** c) Authentication and Deduplication d) Deduplication only	CLO3	Remember
5	To decide on a backup strategy for your organization, which of the following should you consider? a) RPO (Recovery Point Objective) b) RTO (Recovery Time Objective) **c) Both RPO & RTO** d) RTT(Recovery Time Taken)	CLO3	Understand
6	Which of the following can be used for reducing recovery time? a) Partial recovery b) By taking backup on a slower device c) Not taking any other backups d) **Automatic Failover**	CLO3	Understand
7	Which of the following is false? a) The more important the data, the greater the need for backing it up b) A backup is as useful as its associated restore strategy **c) Storing the backup copy near to its original site is best strategy** d) Automated backup and scheduling is preferred over manual operations	CLO3	Understand
8	Information availability is not mentioned in the term a) Accessibility b) Reliability **c) Integrity** d) Timeliness of information	CLO3	Remember
9	Unplanned outages include **a) Failure caused by human errors** **b)** Database updation	CLO3	Remember

	c) Failure of software components **d)**Database recovery		
10	The process of restarting business operations with mirrored consistent copies of data and applications. a) Disaster Recovery b) Recovery- Point -Objective c) Recovery- Time -Objective **d) Disaster Restart**	CLO3	Remember
11	A repository at a remote site where data can be periodically or continuously copied **a) Data vault** **b)** Hot site **c)** Cold Site **d)** Server Cluster	CLO3	Understand
12	The BC planning life cycle includes ____stage : **a) Establishing objectives and Analysing** **b)** Communication **c)** Planning **d)** Deployment	CLO3	Remember
13	A_____refers to the failure of a component that can terminate the availability of the entire system or IT service. **a) Single point of failure** **b)** Multi point failure **c)**Both Single point and multi point **d)** Neither single nor multiple	CLO3	Remember
14	Configuration of multiple paths increases the a) Data integrity **b) Data availability** c) Data confidentiality d) Date reliability	CLO3	Understand
15	Data can be replicated to a separate location within the same storage array. a) Backup **b) Local replication** c) Remote replication d) Archive	CLO3	Understand
16	PowerPath supports user-specified load-balancing policies except: a) Round Robin Policy b) Least I/O Policy c) Least block policy **d)FIFO policy**	CLO3	Understand
17	CAS is____ a) Content Address System b) Communication Archive System **c) Content Addressed Storage** d) Content Available Storage	CLO3	Remember
18	_____depends on business needs and the required RTO/RPO.		

	a) Backup granularity **b)** Full backup **c)** Partial backup **d)** Backup archive	CLO3	Remember
19	The storage node is responsible for _____. a) reading the data to the backup device **b) writing the data to the backup device** c) writing the data to the frontend device d) Store data in the system	CLO3	Understand
20	In a *serverless backup*, the network share is mounted directly on the storage node to avoids **a) overloading** **b)** Congestion **c)** Collision **d)** Data availability	CLO3	Understand
21	How many seconds the RTO required to Cluster production servers with bidirectional mirroring, enabling the applications to run at both sites simultaneously. a) RTO of 72 hours b) RTO of 12 hours **c) RTO of few seconds** d) RTO of few hours	CLO3	Apply
22	*Virtual tapes* are disk drives emulated and presented as tapes to the backup software. The key benefit of using a virtual tape is **a) It does not require any additional modules, configuration, or changes in the legacy backup software. This preserves the investment made in the backup software**. **b)**It requires additional modules, configuration and a backup software **c)**It require a entire backup system either it is server based or non-server based **d)**The entire process is done with the help of the Virtual tape	CLO3	Analyse
23	Two 10-MB PowerPoint presentations with a difference in just the title page are not considered as duplicate files,they are treated as **a) Each file will be stored separately.** **b)** File is duplicate and of existing and it does not stored **c)** File get corrupted **d)** File are stored in same name	CLO3	Analyse
24	Match the following data 1)Target based data deduplication i) backup data before it is stored on the backup device. 2) Inline deduplication ii) Offloads the backup client from the deduplication. 3) Post process deduplication iii) eliminates redundant data 4)Source-based data deduplication iv) backup data written on	CLO3	Analyse

	the backup device first **a)1-ii,2-i,3-iv,3-iii** b)1-iii,2-i,3-ii,4-iv c)1-iv,2-iii,3-I,4-ii 4) d)1-I,2-ii,3-iv,4-iii		
25	What are the various business/technical considerations for implementing a backup solution, and how do these considerations impact the choice of backup solution/implementation? a)Inadequate data usage b)Recovery time c)Manual intervention **d)Automation**	CLO3	Analyse
PART B (4 Marks)			
1	Explain BC planning life cycle	CLO-3	Understand
2	List out the purpose of Backup.	CLO-3	Understand
3	Explain Backup Architecture.	CLO-3	Understand
4	Define Backup Granularity and list out its benefits.	CLO-3	Understand
5	List out Usage of Backup techniques.	CLO-3	Understand
6	Explain Backup Topologies.	CLO-3	Understand
7	Write notes on failure analysis	CLO-3	Understand
8	Describe about the purpose of Backup	CLO-3	Understand
PART C (12 Marks)			
1	Briefly explain about the stages involved in Business Continuity (BC) Planning Life Cycle.	CLO-3	Understand
2	Discuss Failure Analysis and Business Impact Analysis in detail.	CLO-3	Understand
3	Illustrate the process of Sharing Files between host and Virtual machine.	CLO-3	Analyze
4	List out and brief about the steps involved in Backup and restore operations with necessary diagram.	CLO-3	Remember
5	Write the advantages of BC.	CLO-3	Understand

UNIT IV			
Storage Security And Management : Information Security Framework Risk Triad, Storage Security Domains, Security Implementations in Storage Networking, Securing Storage Infrastructure in Virtualized and Cloud Environments, RSA and VMware Security Products, Monitoring the Storage Infrastructure, Monitoring Parameters, Components Monitored, Monitoring,Examples, Storage Infrastructure Management Activities, Storage Infrastructure Management Challenges, Storage Management,Examples, Storage Allocation to a New Server/Host, Creation of an Linux Instance in Public Cloud, Generate a private key, Access using SSH client.			
PART-A (Multiple Choice Questions)			
Q. No	**Questions**	**Course Outcome**	**Competence BT Level**
	The basic information security framework is built to achieve		

1	four security goals are **confidentiality, integrity, availability,accountability** confidentiality, integrity, availability,accessibility confidentiality, information, availability,accountability **d)** countability,integrity, availability,accountability	CLO4	UNDERSTAND
2	Analyse the accountability service maintains a log of events. **a) that can be audited or traced later for the purpose of security.** **b)** that cannot be audited or traced later for the purpose of security. **c)** that can be audited but not be traced later for the purpose of security. that cannot be audited and not to be traced later for he purpose of security.	CLO4	ANALYZE
3	Guess the Risk assessment is the step to determine the extent of potential threats and risks in an IT infrastructure. a) Last Step b) Second Step **c) First Step** d)Third Steps	CLO4	APPLY
4	Determine the types of Security methods and predict about its one of the objective is to ensure about what? a) Three, the network is not easily accessible to authorized users. **b) Two, the network is easily accessible to authorized users.** c) Two, the network is not easily accessible to authorized users. d) Three, the network is easily accessible to authorized users.	CLO4	REMEMBER
5	How to measure the effectiveness of a storage security methodology. **a) One, the cost of implementing the system should be a fraction of the value of the protected data. Two, it should cost heavily to a potential attacker, in terms of money, effort, and time.** b) One, the cost of implementing the system should be a fraction of the value of the unprotected data. Two, it should cost heavily to a potential attacker, in terms of money, effort, and time. c) One, the cost of implementing the system should be a fraction of the value of the protected data. Two, it should not be cost heavily to a potential attacker, in terms of money, effort, and time.	CLO4	EVALUATE

	d)One, the cost of implementing the system should be a fraction of the value of the unprotected data. Two, it should not be cost heavily to a potential attacker, in terms of money, effort, and time.		
6	On type of Potential attacks can be classified as **a) active or passive** **b)** active and passive **c)** Active Passive	CLO4	UNDERSTAND
7	Guess the Malicious hackers frequently use what type of techniques and equipment such as key loggers to monitor keystrokes and capture passwords and login information, or to intercept e-mail and other private communication and data transmission. a) Eavesdropping **b) Snooping** c) Repudiation d)Denial Of Service	CLO4	APPLY
8	What are all the three factors to consider when assessing the extent to which an environment is vulnerable to security Threats? a)Attack surface, aalternate vector, and work factor b) Attack surface, attack vector, and secure factor **c) Attack surface, attack vector, and work factor** d)Attack surface, alternate vector, and secure Factor	CLO4	REMEMBER
9	Which will determines whether an attack is underway and then attempts to stop it by terminating a network connection or invoking a firewall rule to block traffic. a) IPS/ISD b) IDS/ISD c) IPS/ISP d) **IDS/IPS**	CLO4	REMEMBER
10	Guess Zoning is coming under mechanism on the switches that segments the network into specific paths to be used for data traffic **a) Contro**l **b)** Secure **c)** Recovery Bridge	CLO4	APPLY
	Predict the two general categories the security controls for protecting the network fall into a) Network infrastructure integrity and network firewall	CLO4	UNDERSTAND

11	encryption. **b) Network infrastructure integrity and storage network encryption.** c) Network and storage encryption. Network firewall integrity and network encryption.		
12	RBAC is deployed to assign necessary privileges to users, enabling them to perform their roles. ***a)* R*ole-based access control*** **b)** Request-based access control **c)** Role-Band-Access Control Request Band access control	CLO4	REMEMBER
13	In some storage environments, it may be necessary to integrate storage devices with which authentication directories, such as Lightweight Directory Access Protocol (LDAP) or Active Directory. a) Own **b)Third-party** c)admin d)single-party	CLO4	APPLY
14	Lightweight Directory Access Protocol (LDAP) also called as a) Local Directory **b)Actice Directory** c)Passive Directory Local Data Adaptive Directory	CLO4	UNDERSTAND
15	Guess about Backup, replication, and archive is the which domain that needs to be secured against an attack a) First b) Second **c) Third** **d)** Forth	CLO4	UNDERSTAND
16	Which are restrict a switch port's type of initialization. ***a) Port lockdown* and *port lockout*** ***b)*** pin *lockdown*pin *lockout* ***c)***connection*lockdown* and connection *lockout* switch *lockdown* and switch *lockout*	CLO4	REMEMBER
17	Organizations must ensure that the disaster recovery (DR) site maintains what level of security for the backed up data **a) same** **b)** multi parallel d)outer	CLO4	UNDERSTAND
	What will specifies which HBAs and storage ports can be a		

18	part of the fabric, preventing unauthorized devices from accessing it. **a) The device connection control policy** **b)** The security control policy **c)** The Storage Control Policy Handout Backup Accessibility	CLO4	REMEMBER
19	Windows supports two types of ACLs: a) Discretionary access control lists (DACLs) and symmetric access control lists (SACLs). **b) Discretionary access control lists (DACLs) and system access control lists (SACLs).** c) Direct access control lists (DACLs) and symmetric access control lists (SACLs). d) Direct access control lists (DACLs) and system access control lists (SACLs).	CLO4	UN DERSTAND
20	Which refers to a situation in which any existing security threat in the cloud spreads more rapidly and has a larger impact than that in the traditional data center environments. **a) Velocity-of-attack** **b)** Multitenancy **c)** Data Privacy d)Information Assurance	CLO4	UNDERSTAND
21	Monitoring provides the performance and accessibility status of various components. It also enables administrators to perform essential management activities. Monitoring also helps to analyze the utilization and consumption of various storage infrastructure resources. This analysis facilitates **a) Capacity planning, forecasting, and optimal use of these resources.** **b)** Capacity planning,Requirement Analysis, and optimal use of these resources. **c)** Requirement planning,Switching Techniques, and forecasting Forecastingand optimal use of these resources.	CLO4	ANALYZE
22	To ensure about what the Availability management involves in all availability-related issues?At what levels the provision redundancy key activity of availability management involves on? **a) to ensure that service levels are met,all levels** **b)**to ensure that service levels are not met,only on component	CLO4	UNDERSTAND

	levels **c)** to ensure that service levels are opened,only on data levels to ensure that service levels are closed,only on site levels		
23	*Storage tiering* is a technique of establishing a hierarchy of different storage types (tiers). This enables storing the right data to the right tier, based on service level requirements, at a minimal cost. Each tier has different levels of protection, performance, and cost. For example, high performance solid state drives (SSDs) or FC drives can be configured as tier 1 and tier 2.Can you analyse and choose their functionality. **a) Tier 1 storage to kee frequently accessed data, and low cost SATA drives as tier 2 storage to keep the less frequently accessed data.** **b)** Tier 1 storage to keep the less frequently accessed data as tier 2 storage to keep frequently accessed data, and low cost SATA drives **c)** Tier 1 storage to keep frequently accessed data, and low cost SATA drives as tier 2 storage to keep the most frequently accessed data. **d)** Tier 1 storage to keep ffrequently accessed data, drives as tier 2 storage to keep the less frequently accessed data and low cost SATA.	CLO5	ANALYSE
24	The SAN administrator can create distinct VSANs by populating each of them with switch ports. In the example, the switch ports are distributed over two VSANs: Could you Identify those **a) 10 and 20 — for the Engineering and HR divisions, respectively.** **b)** 20 and 10-for the Engineering and HR divisions, respectively. **c)** 1 and 2 — for the Engineering and HR divisions, respectively. **d)** 2 and 1-for the Engineering and HR divisions, respectively.	CLO4	ANALYSE
	The goal of this *management* is to ensure adequate availability of resources on their service level requirements. This management also involves optimization of capacity based on the cost and future needs. It provides capacity analysis that compares allocated storage to forecasted storage on a regular basis. It also provides trend analysis based on the rate of consumption, which must be rationalized against storage acquisition and deployment	CLO5	ANALYSE

25	timetables. Storage provisioning is an example of this management. It involves activities, such as creating RAID sets and LUNs, and allocating them to the host. Enforcing capacity quotas for users is another example of this management. **a) Capacity Management** **b)** Availability Management **c)** Performance Management Security Management		
PART B (4 Marks)			
1	Briefly explain about Information security framework.	CLO4	UNDERSTAND
2	What are the different domains used for storage security?	CLO4	REMEMBER
3	Illustrate about RSA.	CLO4	APPLY
4	Write about cloud environments in storage security.	CLO4	REMEMBER
5	Write down the steps for monitoring the storage infrastructure.	CLO4	UNDERSTAND
6	Why monitoring parameters needed?Explain briefly.	CLO4	ANALYSE
7	Define Management Activity in storage structure.Give example.	CLO4	UNDERSTAND
8	How to allocate new storage for a server/host?	CLO4	APPLY
PART C (12 Marks)			
1	Explain in detail about storage security and management.	CLO4	APPLY
2	Explain about RSA and VMware Security Products with real time example.	CLO4	APPLY
3	Illustrate about storage infrastructure and storage monitoring parameters with neat diagram.	CLO4	UNDERSTAND
4	How to create a Linux Instance in a private cloud?Explain with necessary steps.	CLO4	APPLY
5	Explain about SSH client.	CLO4	APPLY

UNIT V			
Cloud Computing:Cloud Enabling Technologies, Characteristics of Cloud Computing, Benefits of Cloud Computing, Cloud Service Models, Cloud Deployment models, Cloud Infrastructure Mechanism: Logical Network Perimeter, Virtual Server , Cloud Storage Device, Cloud Usage Monitor, Resource Replication, Ready Made environment, Container, Cloud Challenges, Cloud Adoption Considerations, Usage of Cloud services with open source, cloud tools (like Eucalyptus, Openstack, Open Nebula and others)			
PART-A (Multiple Choice Questions)			
Q. No	**Questions**	**Course Outcome**	**Competence BT Level**
1	Which one of these is not a cloud computing pricing model? a) Pay Per Use b) Subscription	CLO6	REMEMBER

	c) Free **d)Ladder**		
2	Which of these is not a major type of cloud computing usage? a) Platform as a Service b) Software as a Service **c) Hardware as a Service** d)Infrastructure as a Service	CLO6	REMEMBER
3	In a the cloud infrastructure is provisioned for exclusive use by a specific community of consumers from organizations that have shared concerns a) Public Cloud model b) Private Cloud model **c) Community Cloud model** d)Hybrid Cloud model	CLO6	APPLY
4	An IT resource that actively filters network traffic to and from the isolated network while controlling its interactions with the internet. **a) Virtual Firewall** **b)** Virtual Network **c)** Logical Network d)Virtual server	CLO6	UNDERSTAND
5	Which cloud storage level a data and its associated metadata are organized as Web-based resources? a) Files b) Blocks **c) Objects** d)Datasets	CLO6	REMEMBER
6	Who maintains status information about how many virtual machines are running? **a) Computer Manager** **b)** Cloud Manager **c)** Cluster Manager d)Security Manager	CLO6	APPLY
7	Public cloud is managed by a) Public **b) Cloud service provider** c) Auditor d)Federal agency	CLO6	UNDERSTAND
8	A form of distributed computing that enables the resources of numerous heterogeneous computers in a network to work together on a single task at the same time is **a) grid computing** b) cloud computing c) Utility computing d)parallel computing	CLO6	REMEMBER
9	A technique that abstracts the physical characteristics of IT resources from resource users **a) Virtualization**	CLO6	REMEMBER

	b) out sourcing c) on demanding d)functionality		
10	Choose benefits offered by Cloud computing a) networking **b) scalability** c) free of cost d)no metering	CLO6	REMEMBER
11	Leverage Amazon's massive computing infrastructure with no up-front capital investment is **a) IaaS** b) PaaS c) SaaS d)HaaS	CLO6	REMEMBER
12	_____captive requires that the cloud accommodate multiple compliance regimes. a) Licensed **b) Policy-based** c) Variable d)Criteria oriented	CLO6	UNDERSTAND
13	The reputation for cloud computing services for the quality of those services is shared by _____ a) replicas b) shards **c) tenants** d)prunes	CLO6	UNDERSTAND
14	Cloud_____are standardized in order to appeal to the majority of its audience. a) SVAs **b) SLAs** c) SALs d)SANs	CLO6	REMEMBER
15	_____is a function of the particular enterprise and application in an on-premises deployment. a) Vendor lock **b) Vendor lock-in** c) Vendor lock-ins d)Vendor	CLO6	REMEMBER
16	Point out the correct statement. a) Except for tightly managed SaaS cloud providers, the burden of resource management is still in the hands of the user **b) Cloud computing vendors run very reliable networks** c) The low barrier to entry cannot be accompanied by a low barrier to provisioning d)Highly coupled Cloud storage providers	CLO6	UNDERSTAND
17	Guess about Business-critical data requires_and___of its access. **a) protection and continuous monitoring** **b)** protection and public monitoring	CLO6	UNDERSTAND

	c) critical thinking and continuous monitoring d)Critical and public monitoring		
18	Which one should be used by Cloud service providers located in different countries to provide cloud services? **a) multiple data centers** **b)** Host data centers **c)** Client data centers d)single data centers	CLO6	ANALYSE
19	Email service on cloud is an example of **a) SaaS** b) PaaS c) IaaS d)CaaS	CLO6	REMEMBER
20	For what the selection of the provider is important. **a) public cloud** **b)** private cloud **c)** Secure cloud d)Hybrid cloud	CLO6	REMEMBER
21	Resource replication is defined as the creation of multiple instances of the same IT resource, and is typically performed when an IT resource's availability and performance need to be enhanced. Virtualization technology is used to implement the resource replication mechanism to replicate cloud-based IT resources. The resource replication mechanism is commonly implemented as a hypervisor. For example, the virtualization platform's hypervisor can access a virtual server image to create several instances, or to deploy and replicate ready-made environments and entire applications. a) Audit Monitor b) SLA Monitor c) Resource Cluster **Resource Replication**	CLO6	ANALYSE
22	The audit monitor mechanism is used to collect audit tracking data for networks and IT resources in support of, or dictated by, regulatory and contractual obligations. Figure 1 depicts an audit monitor implemented as a monitoring agent that intercepts "login" requests and stores the requestor's security credentials, as well as both failed and successful login attempts, in a log database for future audit reporting purposes. a) Pay-per-use monitor b) SLA Monitor **c) Audit Monitor** d)Cloud Usage Monitor	CLO6	ANALYSE
23	i.The capability provided to the consumer is to use the provider's		

	applications running on a cloud infrastructure a)IaaS b)PaaS c)**SaaS** d)CaaS	CLO6	REMEMBER
24	Example of SaaS a) Amazon Elastic Compute Cloud b) Google App Engine c)Microsoft Windows Azure Platform d**)EMC Mozy**	CLO6	REMEMBER
25	Choose practical scenario of cloud service model of PaaS a) Amazon Elastic Compute Cloud b) Google lense **c) Microsoft Windows Azure Platform** d)EMC Mozy	CLO6	UNDERSTAND
PART B (4 Marks)			
1	Define Cloud computing.Write about its features.	CLO6	UNDERSTAND
2	List out the benefits of Cloud computing and explain any 4.	CLO6	REMEMBER
3	Mention the characteristics of Cloud computing and brief about SaaS.	CLO6	REMEMBER
4	Brief about Resource Replication.	CLO6	UNDERSTAND
5	What is meant by Container with respect to Cloud computing?Explain.	CLO6	REMEMBER
6	What are the challenges of Cloud?Brief it.	CLO6	UNDERSTAND
7	Illustrate about any 4 cloud tools briefly.	CLO6	REMEMBER
8	What is Open Nebula Project?Explain.	CLO6	APPLY
PART C (12 Marks)			
1	Explain in detail about Cloud computing enabling technologies.	CLO6	REMEMBER
2	List out the different cloud service models.Explain each with real time example.	CLO6	APPLY
3	Explain in detail about cloud server with neat diagram.	CLO6	UNDERSTAND
4	Explain about cloud infrastructure mechanism in detail.	CLO6	UNDERSTAND
5	Write about Openstack and open nebula tools in detail.	CLO6	REMEMBER

Note:

1. **BT Level –** Blooms Taxonomy Level
2. **CLO – Course Learning Outcomes**

BT1 – Remember BT2 – Understand BT3 – Apply BT4 – Analyze BT5 – Evaluate BT6 – Create