



VIT[®]

Vellore Institute of Technology
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Reg. No. :

23mcA1026

Final Assessment Test (FAT) - May 2024

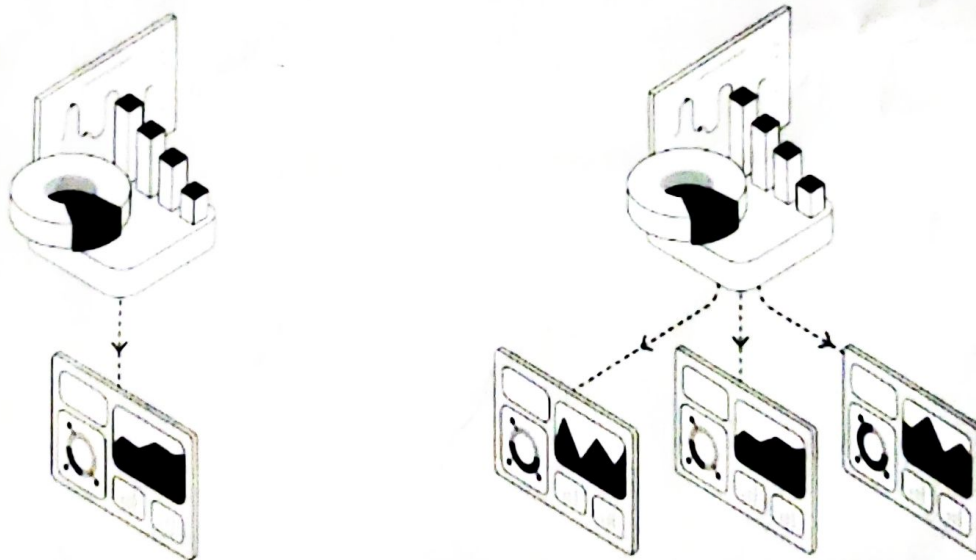
Programme	M.C.A.	Semester	WINTER SEMESTER 2023 - 24
Course Title	CLOUD COMPUTING	Course Code	PMCA506L
Faculty Name	Prof. Gayathri R	Slot	F1+TF1
		Class Nbr	CH2023240501393
Time	3 Hours	Max. Marks	100

General Instructions:

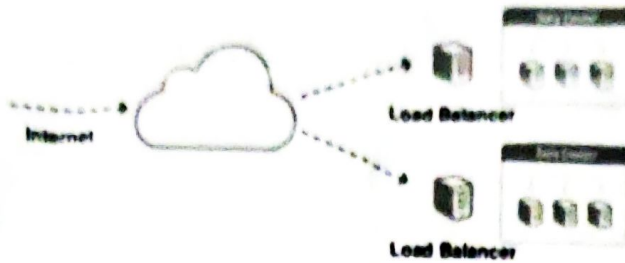
- Write only Register Number in the Question Paper where space is provided (right-side at the top) & do not write any other details.

Answer all questions (10 X 10 Marks = 100 Marks)

01. i) Recognize the key terms related to cloud computing as illustrated in the diagram below, and explain its primary advantages over traditional methods. (5 marks) [10]



- ii) Depict the immediate steps that need to be carried out if one of the servers in the data center is overheated while the entire virtual machine's in the data center are busy handling the bulk volume of user requests to display 10th Board exam results. (5 Marks)
02. i) Identify the concept illustrated by the below diagram and relate its highlights in the Internet banking scenario where the multiple user groups are experiencing delay in accessing their account statement, making NEFT transaction and TAX payments due to unexpected traffic surge. (7 Marks) [10]



ii) Discuss the cloud computing service which is not widely used for practical deployment or running applications but poses more advantages when compared to other service models. (3 Marks)

03. The requirements of ABS Limited are to design a sustainable e-commerce website that requires the services to be available on-demand by getting attached to a secure storage platform with proper access control techniques for high confidentiality of stored information. The website also should have features for filtering the Denial-of-Service (DoS) attack requests, and all underlying user logs and data are stored as plaintext, which is the default requirement provided by all website vendors. In addition to standard services, ABS needs customized services for their website users to have provision for switching multiple user roles after approval by the administrator, and the website needs to be interoperable across various machines. Identify the cloud computing service and deployment model appropriate for developing the website specifications listed by ABS Limited with a neat architecture. [10]
04. Design a cloud storage system for connecting and retrieving health care-related sensor data from an IoT platform to carry out necessary diagnostic procedures in the cloud environment while ensuring complete privacy over the analyzed data outcomes. The system should also get feedback from its users for continuous improvement and to retain customers's trust. It should also employ scaling features for storing more data volumes if the number of customers increases. Formulate a neat architecture for a cloud storage system by depicting the procedure for storing sensor data in cloud data centers with proper justification. [10]
05. Analyze the hypervisor choice, virtualization technology appropriate for a online education scenario where the students accesses course materials from various geographic location. If more request from students arises consecutively in short time span, all requests need to be handled without any delay and optimized performance. Depict the underlying architecture appropriate for handling the requests in online education scenario with neat sketch. How Software Defined Networking (SDN) could help in aforementioned scenario if the online education portal experiences security violations?. [10]
06. Propose an appropriate map reduction programming paradigm for automating the requirements of the ABC organization. The ABC organization has planned to calculate the number of appraisals given to each of their employees in Branch A. All the associated details could be found in the master database of the ABC organization. Depict the step-by-step procedure of the map-reduce approach with a neat architecture. Discuss how the final outcome of the map reduction approach would ease the task of the ABC organization. [10]
07. i) Illustrate the basic differences between a container and a virtual machine. (3 Marks) [10]

- ii) Depict the key components in the process of deploying a simple e-commerce website application with pages for displaying product details and customer support in a container with a neat sketch. (5 Marks).
- iii) How does the master node in Kubernetes work to assign a set of tasks to its slave nodes? (2 Marks)

08. Mr. Jisman is an Amazon Web Service (AWS) user who maintains his complete list of personal data on one of the virtual servers of the AWS portal. He configured proper security rules in order to restrict outside access to his virtual server. In the last few days, he has experienced huge incoming traffic targeting his virtual server. Since the maintained virtual server's holds sensitive information related to his organization, he is supposed to take immediate corrective measures to figure out the cause. To get rid of the issue temporarily, he applied auto-scaling procedures. Help Mr. Jisman identify and automatically block the incoming surge of suspicious traffic by suggesting appropriate automation procedures on the data center side. Discuss the applied solution with a neat architecture. [10]
09. Xeon is a health care organization that maintains its confidential records on a cloud platform. Since they store 10TB of data, they are supposed to pay a huge sum to the cloud service provider's. In the service level agreement, Xeon agreed to provide complete encryption security for the confidential data, both in-rest and in-motion. Depict the underlying architecture of Xeon and elaborate on what needs to be the sequence of security measures adopted in order to ensure security and access control over their stored data in a cloud environment. Discuss the identity management techniques that could be adopted to ensure the seamless functioning of Xeon. [10]
10. A group of six banking servers attempts to replicate the primary server for backup. Among the six, priority will be given to the server that contains recently cached files. A replica will be eligible if it contains recently cached files with proper validation protocols. Hence, to carry out the same, all the replicas's attempts simultaneously to update their cache files. Each cache file update requires high bandwidth due to the large file size. In order to sort out such arising issues among the replica's, the VM monitoring needs to be enabled 24x7 to notify higher officials of this issue and arrive at a faster response. The default actions will be carried out as per the pre-defined triggers set by the bank administrator. On applying such VM monitoring features, depict the list of security violations that could be overruled. Discuss any three key security violations in detail. [10]

