VIT
Vellore Institute of Technology
(Deemed to be University under section 3 of UGC Act, 1956)

SLOT – A1+TA1+A2+TA2

SCHOOL OF INFORMATION TECHNOLOGY AND ENGINEERING
Mid Term – SUMMER SEMESTER -II, 2023

Programme Name: MCA **Class Number(s):** VL2022230701038, VL2022230701039, VL2022230701040

Course Name Code: ITA6006 **Course Name: Storage Systems and Management**

Faculty Name: Dr. Karthikeyan P, Dr Arunkumar A, Mr. Maddiralla Vinay

Answer all the questions (5 x 10=50) **Max Marks: 50**

Q.no.	Question
1.	The GRIT (GreenBook Research Industry Trends) is the leading survey of the insights industry worldwide. Over 30,000 market researchers, marketers, and executives—both clients & suppliers—use each edition to understand the trends impacting the industry and profession. They see GRIT as an invaluable resource to future-proof their organizations and careers, in ways both strategic and tactical. Assume that GRIT plan to establish its new branch in India. The Technical team had a brainstorming session in order to optimize its IT infrastructure. As a research intern, enlist the Critical Parameters involved in deploying a storage system for above scenario with the required key elements for developing the data centre for GRIT.
2.	Consider an application that requires 1TB of storage capacity and performs 5600 IOPS. Application I/O size is 6KB, as it is business critical application, response time must be within acceptable range. Specification of available disk drive: Drive capacity = 100 GB 15000 RPM 6ms average seek time 40 MB/sec transfer rate Calculate the number of disks required?
3.	Assume that 3i Technologies, IT Solutions company undertakes the financial transactions monitoring process in ATMs for a bank which is operated in all over the states in India. During the recent security audit meeting the CTO pointed out the transaction process aspects is facing service delays in customer's side. Deploy a suitable hybrid RAID solution for achieving the better solution to increase the transaction speed.
4.	Consider a disk I/O system in which an I/O request arrives at the rate of 60 IOPS. The disk service time is 5ms. **Compute the following:** Utilization of I/O controller, Total response time, Average queue size, Total time spent by a request in a queue, Compute the preceding parameter if the service time is halved.
5.	Microsoft Azure or Amazon Web Services (AWS) offers same type of cloud storage which is designed for storing and managing large amounts of unstructured data, such as text files, images, videos, audio files, backups, and other binary data – Expound on this concept and propose a detailed explanation.

VIT
Vellore Institute of Technology

Summer Term II Final Assessment Test –August 2023

Course: **ITA6006 - Storage Systems and Management**

Class NBR(s): **1038 / 1039 / 1040** **Slot: A1+TA1+A2+TA2**

Time: **Three Hours** Max. Marks: **100**

KEEPING MOBILE PHONE/SMART WATCH, EVEN IN 'OFF' POSITION, IS TREATED AS EXAM MALPRACTICE

Answer ALL Questions

(10 X 10 = 100 Marks)

1. In both traditional data centre and virtualized environments, managing information can be expensive if not managed appropriately. Along with the tools, an effective management strategy is also required to manage information efficiently. Provide your detailed explanations.

2. A disk drive is an electromechanical device that governs the overall performance of the storage system environment. Analyse the various factors that affect the performance of disk drives in detail.

3. Consider a disk I/O system in which an I/O request arrives at the rate of 120 IOPS. The disk service time is 6 ms. Compute the following: Utilization of I/O controller, Total response time, Average queue size, Total time spent by a request in a queue, Compute the preceding parameter if the service time is halved.

4. "High-performance, durable block storage for business-critical applications" & *"Massively scalable and secure object storage for cloud-native workloads, archives, data lakes, high-performance computing, and machine learning"* – Identify the suitable cloud data storage and explain with neat sketch.

5. Discriminate IDE with SCSI based on connectors, cabling methods and communication.

6. Identify the FC switch function that enables node ports within the fabric to be logically segmented into groups and to communicate with each other within the group. Clarify the types of FC switch functions with relevant diagrams.

7. Ports – Tx , Rx, MMF and SMF, Hubs – What are these jargons ? Identify the concept behind these and explain the concept associated with these terms.

8.
- Bandwidth and latency issues associated with IP affect NAS performance.
- Network congestion is one of the most significant sources of latency in a NAS environment.

Explicate the other factors that affect NAS performance at different levels.

9. A system has three components and requires all three components to be operational 24 hours, Monday through Friday. Failure of component 1 occurs as follows:

- Monday = No failure.
- Tuesday = 5 a.m. to 7 a.m.
- Wednesday = No failure.
- Thursday = 4 p.m. to 8 p.m.
- Friday = 8 a.m. to 11 a.m.

Draw the MTBF Timeline chart and Calculate the Availability, MTBF, and MTTR of component 1.

10. Assume that you are required to design the data centre for "Aadhar Card Web Application". By considering "Privacy of Citizen", "Data Security", "Data Recovery", "Disaster Management" and for "Large Data Storages" describe the methods used to determine the suitable "RAID SET" for the mentioned application. Provide the neat diagram with strong justifications.

⇔⇔⇔