2/16

0605N333

Candidate's Seat No : _____

MSc Sem.-2 Examination

411

Computer Science

Time : 2-30 Hours] **May-2025** **[Max. Marks : 70**

Q:1 (A) What is cluster computing? Draw and Explain the architecture of a typical cluster system. (7)

Q:1 (B) Explain the steps involved in setting up a cluster. What are the essential components needed for a cluster setup? What are the key security considerations when setting up a cluster system? Discuss the importance of each. (7)

OR

Q:1 (A) What are the key components in the prototype implementation of scalable services? Discuss each component's role. (7)

Q:1 (B) What is a grid computing system? Discuss the evolution of grid computing from the first to the third generation. (7)

Q:2 (A) Discuss the concept of resource management and scheduling (RMS) in cluster computing. Why is it essential for efficient cluster operation? (7)

Q:2 (B) What is meant by resource sharing in scalable services? Discuss its significance in improving performance. Explain the concept of enhanced locality in resource sharing. How does it contribute to more efficient service construction? (7)

OR

Q:2 (A) What are the key components in the prototype implementation of scalable services? Discuss each component's role. (7)

Q:2 (B) What is the grid context? Discuss its significance in understanding how grids are implemented in production environments. How does grid support for collaboration enhance the capabilities of distributed computing systems? (7)

Q:3 (A) Discuss the steps involved in transitioning to a prototype production grid. How do you ensure scalability and reliability? (7)

Q:3 (B) Explain the concepts of cross-site trust management in production grids and its importance for security and data integrity. (7)

OR

Q:3 (A) What is the process of building an initial multisite computational grid? Discuss (7)

(P.T.O)

the challenges and solutions.

Q:3 (B) What are the building blocks of the grid? Explain the role of each in supporting grid-based applications. (7)

Q:4 (A) How does the extension of scalable services affect the overall system performance and reliability? (7)

Q:4 (B) Discuss the challenges faced when constructing scalable services and how they can be mitigated. (7)

OR

Q:4 (A) What are the different classifications of clusters? Provide an overview of each type. (7)

Q:4 (B) Discuss the motivation behind low-cost parallel computing. How does cluster computing address this challenge? (7)

Q:5 True/False Attempt any seven out of Twelve (Each carries 2 Marks) (14)

1 A cluster computer is typically a collection of homogeneous computers that work together to solve a single problem.

2 The primary motivation for low-cost parallel computing is to reduce the cost of computing infrastructure while maintaining performance.

3 Resource management and scheduling (RMS) in clusters only involve the allocation of network bandwidth.

4 Setting up a cluster involves configuring hardware, installing necessary software, and ensuring network connectivity between the nodes.

5 Cluster security is less important than in single-machine systems due to the distributed nature of the environment.

6 System monitoring in a cluster environment is crucial to identify bottlenecks and prevent system failure.

7 Resource sharing is essential for enhancing the scalability and performance of services in distributed computing environments.

8 Enhanced locality in resource sharing refers to minimizing the distance between resources to improve access speed.

9 The prototype implementation of scalable services is only focused on the software components and does not consider hardware performance.

10 Grid computing allows multiple organizations to share their computational resources for solving large-scale problems.

11 The first generation of grid computing was focused mainly on research and scientific applications.

12 A grid context refers to the specific environment in which grid resources and applications are deployed and utilized.