

## Assignment 2

### Part(A) Multiple Choice Questions

Name - Deepankar Sharma  
Course - MCA  
Student ID - 233512013  
Subject - Advance OS  
Course ID - OMC 104

- Ques① (b) Separate computers working together to achieve a common objective.
- Ques② (d) By continuing operations even if one site fails through redundancy.
- Ques③ (b) Resource sharing allows users to access resources at other sites, enhancing flexibility and functionality.
- Ques④ (b) For a proportionate increase in parallel speedup with the addition of more processors.
- Ques⑤ (c) Here one SMP can directly access memory of another SMP and not all processors have equal access time to all memories.
- Ques⑥ (b) Private Cloud
- Ques⑦ (c) Object storage
- Ques⑧ (b) Platform as a Service (PaaS)
- Ques⑨ (b) Operating at the application level
- Ques⑩ (c) Implementing Infrastructure as a Service (IaaS)

### Part(B) Descriptive Questions

#### Ques① Advantages of Distributed Systems

Reliability: Distributed systems can enhance reliability by spreading tasks across multiple nodes. If one node fails, others can continue to function ensuring system availability.

Scalability: Distributed systems can scale horizontally by adding more machines to the network, accommodating increased workloads and user demands.

Performance Improvement: Tasks can be executed concurrently on different nodes, leading to improved performance and reduced response time.

Resource Sharing: Distributed systems allow effective resource sharing.

Fault Tolerance: With redundancy & backup mechanisms, distributed systems have high fault tolerance.

Geographically dispersed: Distributed systems provide geographical flexibility allowing access to resources across various locations.

## Ques② Difference between Computation Migration and Process Migration

Computation Migration: Refers to migration of computation tasks or overloads from one machine to another. This involves relocating the entire computation, including its state and data.

Process Migration: Involves moving an active process (a running program) from one machine to another within a network. It includes transferring the process's state, code & data.

## Ques③ Difference between Symmetric Multiprocessing (SMP) & Asymmetric Multiprocessing

### Symmetric Multiprocessing

- All the processors in the system are identical and share access to the same memory & I/O facilities
- Tasks can be assigned to any processor and the workload is balanced among the balances.
- Typically used for general purpose computing where tasks are relatively equal.
- Offers better load balancing and scalability.

### Asymmetric Multiprocessing

- There is a master-slave relationship among processors, where one processor (master) controls the system & delegates tasks to other processors (slaves).
- The master processor often handles the operating system & scheduling, while slave executes specific tasks.
- Used in systems with varying processor capabilities or specialized tasks.

## Ques④ Significance of Hypervisors in Virtualization

Hypervisors are also known as Virtual Machine Monitors (VMM), manage and allocate physical resources to multiple virtual machines (VMs). They enable the coexistence of multiple operating systems on a single physical machine. Hypervisors provide isolation between VMs, ensuring that activities within one VM do not affect each other. They improve resource utilization by allowing multiple VMs to run on same hardware simultaneously.

### Ques 6 Four Benefits of Virtualization

Resource Consolidation: Virtualization allows multiple virtual machines to run on a single physical server, optimizing resource utilization and reducing hardware costs.

flexibility and scalability: Virtualized environments can easily scale up or down based on changing workloads. New virtual machines can be quickly provisioned or decommissioned.

Isolation and security: Virtual machines operate independently, providing isolation between different applications and operating systems. This enhances security by containing potential breaches via a single VM.

Efficient Disaster Recovery: Virtualization enables the creation of snapshots and backups of virtual machines, making disaster recovery faster and more efficient. Virtual Machines can be easily migrated or restored to different hardware.