Midterm 2023

Question 1

Define the following:

1) **Utility computing**: is a service provisioning model where a provider makes computing resources, infrastructure management and technical services available to customers as they need them

2) **Data Locality**: refers to the tendency of computer programs to access data elements that are close to each other in memory, optimizing performance by minimizing the time spent accessing distant data

3) **Performance miss match**: It is the situation when there is discrepancy or inconsistency between the expected performance of a system and it's actual performance, due to the performance gap between the CPU, RAM and storage

4) **Live lock**: It is when two or more processes are stuck in a loop responding to each other's actions without any progress

5) **Cloud Bursting**: It is the practice of automatically and temporarily adding computing resources from a puplic cloud to a private clould in order to handle spikes in demand

6) **SLA**: It is stands for service level agreement which is a contract or an agreement between a service provider and its customers that defines the level of service that the Provider is expected to deliver, includes (measurable metrics or Performance indicators and non_functional requirements that specify the quality, availability,

reliability, security and responsiveness of the service as well as the consequences or penalities if the Provider fails to meet these matrics or requirments

7. **Nondeterministic**: refers to a system or process where outcomes are not predictable with certainty, often influenced by random or unpredictable factors, leading to different possible results for the same intial conditions

8. **Persistence transparency**: refers to the property in computer systems where the mechanisms used to store data are abstracted away from application, allowing the application to interact with data without needing to be aware of the underlying storage details ensuring consistency and reliability across different storage systems

9. **Vertical Virtualization**: Full virtualization, involves the deployment of hypervisors directly on top of bare hardware devices, allowing all software, including multiple unmodified guest os to execute on the raw hardware

10. **Elasticity**: Degree to which a system can adapt to workload change by provisioning and deprovisioning resources in an automic manner, such that at each point in time the available resources match the current demand as closely as possible to avoid over_provisioning or under_provisioning

Question 2:

1. middleWare acts as a solution to the challenges posed by heterogeneity, facilitating interoperability and integration in distributed systems

2. Virtualization Plays a crucial role in Green ICT initiatives by enabling more efficient use of resources, reducing energy consumption and Promoting enViromental sustainability in IT operations

Question 3:

	Full Virtualization	Para Virtualization	os Virtualization
eXamples	UMWare	Xen_KUM	Docker_FUM
Host os	not eXists	eXists	eXists
Deployment	Directly sits on top of the bare hardWare devices	Runs on conventional os as other programs	abstraction layer between traditional os and user applications
Differences	Run multi_unmodified guest oss by sharing the resources of a single hardWare across them	Run modified guest oss by communicating directly to the Virtualization layer	create isolated containers from a single Physical server and os instance
similarity	they are all methods that allow Virtualization to occur on a single Physical machine		