



**NAMIBIA UNIVERSITY  
OF SCIENCE AND TECHNOLOGY**

**FACULTY OF COMPUTING AND INFORMATICS**

DEPARTMENT OF COMPUTER SCIENCE

<b>QUALIFICATION: BACHELOR OF COMPUTER SCIENCE</b>	
<b>QUALIFICATION CODE:</b> 07BACS 07BCMS	<b>LEVEL:</b> 7
<b>COURSE:</b> SYSTEM VIRTUALISATION	<b>COURSE CODE:</b> SVT710S
<b>DATE:</b> JUNE 2023	<b>PAPER:</b> THEORY
<b>DURATION:</b> 3 HOURS	<b>MARKS:</b> 85

<b>FIRST OPPORTUNITY EXAMINATION QUESTION PAPER</b>	
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**THIS QUESTION PAPER CONSISTS OF 4 PAGES**

(Excluding this front page)

**INSTRUCTIONS**

1. Answer ALL the questions on the answer scripts.
2. Write clearly and neatly.
3. Number the answers clearly.

**PERMISSIBLE MATERIALS**

1. Calculator.

**Section A: (Multiple choice)**

**(20 Marks)**

**Read each question carefully, and then select THE ANSWER that best fits the question**

1. \_\_\_\_\_ computing refers to applications and services that run on a distributed network using.
  - a) Cloud
  - b) Docker
  - c) Distributed
  - d) Parallel
2. Which of the following is essential concept related to Cloud?
  - a) Abstraction
  - b) Productivity
  - c) Reliability
  - d) All of the above
3. A Docker registry is a place to store and distribute Docker.....
  - a) Codes
  - b) Files
  - c) Images
  - d) All of the above
4. Which command is used for running the images as a container?
  - a) docker ps
  - b) Files
  - c) docker run -it alpine /bin/bash
  - d) docker run container name
5. Which RAID type doesn't use parity for data protection?
  - a) RAID 6
  - b) RAID 4
  - c) RAID 1
  - d) RAID 5
6. Which of the following is a type of virtualization?
  - a) Storage
  - b) Desktop
  - c) CPU
  - d) All of the above
7. What is the minimum number of disks required for RAID?
  - a) 1
  - b) 2
  - c) 4
  - d) 6
8. An array of disks is more likely to fail compared to a single disk. How is it that RAID arrays still manage to provide more data protection compared to a single disk?
  - a) Using either mirroring or striping
  - b) Using either mirroring or parity
  - c) Using better quality disks
  - d) Using dedicated hardware

9. Which of the following will be the host operating system for Windows Server?
  - a) Virtual Logix VLX
  - b) Microsoft Hyper-V
  - c) Xen
  - d) All of the mentioned
10. Which of the following is another name for system virtual machine?
  - a) Hardware virtual machine
  - b) Software virtual machine
  - c) Real machine
  - d) None of the mentioned
11. Which RAID type doesn't use parity for data protection?
  - a) RAID 1
  - b) RAID 4
  - c) RAID 6
  - d) RAID 5
12. Which one of these is a characteristic of RAID 5?
  - a) Distributed parity
  - b) No Parity
  - c) All parity in a single disk
  - d) Double Parity
13. Which of the following is associated with considerable vendor lock-in?
  - a) PaaS
  - b) IaaS
  - c) SaaS
  - d) SaaS
14. Which of the following is true?
  - a) docker ps shows all running containers by default.
  - b) docker ps shows all containers by default
  - c) none of the mentioned
15. The \_\_\_\_\_ cloud infrastructure is operated for the exclusive use of an organization.
  - a) Public
  - b) Private
  - c) Community
  - d) All of the mentioned
16. When it comes to avoiding major outages, the use of server virtualization:
  - a) Reduces the frequency of hardware-related service outages
  - b) Has no material impact
  - c) Requires that levels of redundancy be increased in order to avoid an increase in outages affecting multiple applications/services.
17. Network level virtualization in a SAN fabric can be implemented by having virtualization engine running in \_\_\_\_\_?
  - a) HBA
  - b) FC switch
  - c) Raid array
  - d) Any of the mentioned

18. Which of the below is component of SAN?
  - a) Ethernet switch
  - b) Fibre Switch
  - c) Ethernet Card
  - d) None of the mentioned
19. What is one significant advantage of Virtualization in datacenters?
  - a) Can manage the Data center with Zero Manpower
  - b) Mirroring for Disaster Recovery
  - c) Eliminate the need of physical devices for the Data center
  - d) None of the mentioned
20. Which command is used to delete a container?
  - a) delete
  - b) remove
  - c) rm
  - d) drop

**Section B: True or False\_**

**(10 Marks)**

***Read each statement below carefully and state whether false or true.***

1. A template is a point-in-time captured state of a VM that can be returned to over and over again.
2. In Virtualisation containment means running multiple workloads on a single host.
3. NFS is one the two file systems to Hypervisor uses that manage the VM files.
4. Failure of a single disk in a RAID 1 array will not result in permanent data loss.
5. A virtual machine connects from the virtual NIC to a Virtual Switch.
6. Virtualization is a framework or methodology of dividing the program files of a computer into multiple execution environments.
7. In a VMware environment, a .vmdk file represents a virtual machine's Network Card.
8. DNS is used to automatically provide IP addresses for both physical and virtual servers.
9. VMware Workstation is an example of a Type 1 hypervisor.
10. LUN is a storage technology that deals with how data is spread across multiple disks for both increased availability and improved performance.



**Section D****[55 marks]****Answer all the questions in this section.**

1. You are a system administrator for company ABC and you are planning to automate an installation of Tomcat on two web servers (web1.svt.na, web2.svt.na) and MySQL on three database servers (db1.svt.na, db2.svt.na, db3.svt.na) using Ansible. Please write an inventory file to execute this task. [4 Marks]
2. Name two kind of protection mechanisms that are required to control communication between virtual machines on a single physical server. [2 Marks]
3. Name five stages that happens when you start a container [5 Marks]
4. Name three challenges that prevent Cloud Computing from being adopted as per the survey conducted by IDC. [3 Marks]
5. Can you explain how community cloud computing works and how it can be deployed? [4 Marks]
6. As a system administrator, if you want to install an operating system and applications on your own, which service model would you need to request from the cloud provider? [2 Marks]
7. What enables VM to directly access LUNs in a storage system? [1 Marks]
8. What is the difference between consolidation and containment in virtualization? [2 Marks]
9. Name two ways of implementing emulation. [2 Marks]
10. What is the main objective of network virtualization? [2 Marks]
11. There are five levels of virtualization implementation, name three of them. [3 Mark]
12. Why does performance become poor at Instruction Set Architecture (ISA) Level? [2 Marks]
13. What is the primary function of a virtualization layer? [ 2 Marks]
14. How are VMs stored on the hypervisor? [2 Marks]
15. Explain two methods of expanding VMFS. [4 Marks]
16. When is Thin Pool Rebalancing performed in storage virtualisation? [2 Marks]
17. One of the disadvantages of cloud computing is vendor lock-in. Can you explain what you understand about it? [2 Marks]
18. What is the difference between consolidation and containment in virtualization? [2 Marks]
19. Why does performance become poor at Instruction Set Architecture (ISA) Level? [2 Marks]
20. What is the use of a playbook in Ansible? [2 Marks]
21. Can you provide your own interpretation of the term "multi-tenancy" in cloud computing? [2 Marks]
22. How are the customers charged in cloud computing? [2 marks]
23. Write a Docker command that will run a container in a background (detached) mode using an Ubuntu image and bash as a command. [3 Marks]

# Good luck!!