NAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY

FACULTY OF COMPUTING AND INFORMATICS

DEPARTMENT OF COMPUTER SCIENCE

QUALIFICATION: BACHELOR OF COMPUTER SCIENCE	
QUALIFICATION CODE: 07BACS 07BCMS	**LEVEL:** 7
COURSE: SYSTEM VIRTUALISATION	**COURSE CODE:** SVT710S
DATE: JUNE 2024	**PAPER:** THEORY
DURATION: 3 HOURS	**MARKS:** 84

FIRST OPPORTUNITY EXAMINATION QUESTION PAPER	
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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. A tool for orchestrating distributed applications with docker.
   a) Docker Machine
   b) Docker Compose
   c) Dockerfile
   d) All of the mentioned
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. 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
9. 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

10. Which RAID type doesn't use parity for data protection?
    a) RAID 1
    b) RAID 4
    c) RAID 6
    d) RAID 5
11. Which one of these is characteristic of RAID 5?
    a) Distributed parity
    b) No Parity
    c) All parity in a single disk
    d) Double Parity
12. Which of the following is associated with considerable vendor lock-in?
    a) PaaS
    b) IaaS
    c) CaaS
    d) SaaS
13. 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
    d) both a and b
14. The _____ cloud infrastructure is operated for the exclusive use of an organization.
    a) Public
    b) Private
    c) Community
    d) All of the mentioned
15. 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
16. Which of the below is a component of SAN?
    a) Ethernet switch
    b) Fibre Switch
    c) Ethernet Card
    d) None of the mentioned
17. Which of the following is a tool that clusters many engines and schedules containers?
    a) Docker Machine
    b) Docker Compose
    c) Docker Swarm
    d) None of the mentioned
18. Which of the following is a Linux hardening solutions for Docker.
    a) Docker Machine SELinux
    b) GRSECe
    c) Both a and b
    d) None of the mentioned

19. A Docker registry is a place to store and distribute Docker_____.
    a) Codes
    b) Files
    c) Images
    d) All of the above
20. A tool for orchestrating distributed applications with docker.
    a) Docker Machine
    b) Docker Hub
    c) Dockefile
    d) All of the mentioned

Section B: True or False_ **(10 Marks)**

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

1. Emulators are most useful when you need to test how software interacts with the attached input devices.
2. The hypervisor is a layer of software that resides above the virtual machines and below the hardware.
3. In virtualization at the Operating System Level, we keep the base O.S. the same and install only the differences in each single Virtual machine.
4. One of the virtual provisioning best practices is to have HHD in a thin pool with the different RPM.
5. Cloud computing is a model for enabling convenient, on-demand network access to a limited pool of configurable computing resources.
6. Hypervisor performs virtual provisioning to create virtual disks for VMs.
7. Virtual machines are the fundamental components of virtualization.
8. In a thin pool the allocated capacity is reclaimed by the pool when Thin LUNs are destroyed
9. The elastic resource pool has made the cost analysis a lot more complicated than regular data centres.
10. Virtual provisioning may be implemented at the network layer.

Section C **[54 marks]**

Answer all the questions in this section.

1. A healthcare organization needs to deploy a new electronic health records (EHR) system. Which cloud deployment model would you recommend, and why? [2]
2. A startup company is developing a new web application and needs to host it on the cloud. Which cloud service model (IaaS, PaaS, SaaS) would be most suitable for them?[2]
3. A multinational corporation is looking to streamline its email and collaboration tools for employees across different geographic locations. Which cloud service model (IaaS, PaaS, SaaS) would you recommend for their email and collaboration needs? [4]
4. What do you understand by the term 'On-Demand Self-Service' in cloud computing, and how does it benefit organizations? [4]
5. Explain what Vendor Lock-In is in the context of cloud computing and provide an example of strategies that organizations can adopt to mitigate the risks associated with Vendor Lock-In. [4]
6. How does the hypervisor eliminate the need for overprovisioning virtual disks? [2]
7. An organization requires fault tolerance and data redundancy. Which RAID level is suitable for this scenario, and how does it achieve fault tolerance? [2]
8. Name four advantages of containers over virtual machines (VMs). [4]
9. Name two ways in which you can run Docker daemon. [4]
10. Name three tools for orchestrating distributed applications with Docker. [3]
11. What is the mechanism used to prevent a virtual machine from being powered on by more than one host? [1]
12. A company needs high performance and has a limited budget for storage. Which RAID level would you recommend, and why? [2]
13. Name two ways in which you can run docker daemon. [4]
14. What is the drawback Virtualization at Operating System Level [2]
15. What do you understand by the term SLA and what does it stand for? [3]
16. Name three tools for orchestrating distributed applications with Docker. [3]
17. When is Thin Pool Rebalancing performed in storage virtualisation? [2]
18. One of the disadvantages of cloud computing is vendor lock-in. Can you explain what you understand about it? [2]
19. How does the hypervisor eliminate the need for overprovisioning virtual disks? [2]
20. What is the use of a playbook in Ansible? [2]

Good luck!!