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Question Paper Code	13350
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M.E. / M.Tech. - DEGREE EXAMINATIONS, NOV / DEC 2024 (JAN - 2025)

First Semester

M.E. - Computer Science and Engineering (with Specialization in Networks)

24PCNPC102 - VIRTUALIZATION TECHNOLOGIES

Regulations - 2024

Duration: 3 Hours

Max. Marks: 100

PART - A (10 × 2 = 20 Marks)

Answer ALL Questions

	<i>Marks</i>	<i>K- Level</i>	<i>CO</i>
1. Name any two popular virtualization platforms.	2	K1	CO1
2. Differentiate Type 1 and Type 2 hypervisors.	2	K2	CO1
3. Define memory partitioning in virtualization.	2	K1	CO2
4. List out the purpose of memory over-commitment in virtualization.	2	K1	CO2
5. Give the use of tunneling in virtual networking.	2	K1	CO3
6. Mention the role of storage hypervisor in managing virtualized storage.	2	K1	CO3
7. Identify the benefits of elastic cloud computing.	2	K2	CO4
8. Differentiate hot migration and cold migration in the context of virtualized computing.	2	K2	CO4
9. List out the key benefits of using virtualization in grid computing for large-scale data processing.	2	K1	CO5
10. Give the purpose of VM templates in virtual machine provisioning.	2	K1	CO5

PART - B (5 × 13 = 65 Marks)

Answer ALL Questions

11. a) Analyze the impact of hardware-assisted virtualization on the performance and scalability of virtualized systems with its benefits and limitations. 13 K4 CO1

OR

b) How does CPU scheduling work in a virtualized environment and how does it differ from scheduling on physical hardware? Analyze how the scheduling mechanism affects virtual machine's performance. 13 K4 CO1

12. a) How memory reclamation works in a virtualized system and the trade-offs between freeing up memory for virtual machine? 13 K2 CO2

OR

b) How does memory sharing in virtualization improve memory efficiency with their challenges? 13 K2 CO2

13. a) Briefly explain how virtual I/O servers facilitate communication between virtual machines and physical hardware devices in a virtualized environment with sketch. 13 K2 CO3

OR

- b) Explain the role of storage virtualization in consolidating physical storage resources into a single virtual storage pool with its benefits and challenges. 13 K2 CO3

14. a) Discuss the concept of I/O bottlenecks in virtualized environments. Identify common causes of bottlenecks and outline strategies to mitigate them. 13 K2 CO4

OR

- b) Discuss the role of overlay networks in virtual environments. How do they help in creating flexible and scalable networking solutions? 13 K2 CO4

15. a) How does virtualization enable the provisioning of Virtual Machines in cloud environments? Mention the advantages of on-demand VM provisioning. 13 K2 CO5

OR

- b) How does the integration of virtualization and containerization benefit cloud-native applications and micro-services? Study the level of efficiency, scalability and deployment speed. 13 K2 CO5

PART - C (1 × 15 = 15 Marks)

16. a) Netflix is one of the world's largest streaming platforms, with millions of active users across the globe. The company experiences massive and unpredictable demand spikes, especially during peak times like the release of popular shows or movies. Use elastic cloud computing to handle these traffic variations and provide uninterrupted service. 15 K3 CO4

OR

- b) A **Software-as-a-Service provider** offering a cloud-based accounting solution needs to scale its infrastructure to handle fluctuating demand from users. During tax season, the company experiences an increase in traffic. Use clustering to handle the issue and ensure load balancing. 15 K3 CO4