Reg. No.															

Question Paper Code	14272

M.E. / M.Tech. - DEGREE EXAMINATIONS, NOV / DEC 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 (MCQ) (10 × 1 = 10 Marks)

Answer ALL Questions

		Marks	K – Level	CO
1.	Which company pioneered commercial server virtualization in the modern era? (a) Microsoft (b) VMware (c) Red Hat (d) Oracle	1	K1	CO1
2.	In virtualization, a hypervisor is responsible for: (a) Managing storage arrays (b) Translating high-level languages (c) Creating and managing virtual machines (d) Scheduling threads in an OS	1	K1	CO1
3.	The process of starting a virtual machine is known as: (a) Instantiation (b) Booting (c) Swapping (d) Scheduling	1	K1	CO2
4.	In virtualization taxonomy, OS-level virtualization is used for: (a) Isolating processes using shared kernel (b) Creating hardware emulation (c) Running multiple operating systems (d) Scheduling CPU threads	1	K1	CO2
5.	The Xen hypervisor primarily supports: (a) OS-level virtualization (b) Para-virtualization (c) Containerization (d) Emulation	1	K1	CO3
6.	A classic virtual machine provides: (a) One OS per physical processor (b) Logical isolation of multiple operating systems (c) No separation between applications (d) Support for only one user	1	K1	CO3
7.	Which of the following is a commercial example of virtualization software? (a) VMware vSphere (b) Hadoop (c) TensorFlow (d) MySQL	1	K1	CO4
8.	Which layer performs the trapping of privileged instructions in virtualization? (a) Virtual BIOS (b) Hypervisor layer (c) User space (d) Guest OS kernel	1	K1	CO4
9.	The booting process of a virtual machine is managed by: (a) The physical BIOS (b) Virtual BIOS or firmware (c) Guest OS directly (d) Storage controller	1	K1	CO5
10.	VMware ESXi is a: (a) Type 2 hypervisor (b) Type 1 hypervisor (c) Kernel-level driver (d) Virtual network interface	1	K1	CO5

PART - B (12 × 2 = 24 Marks)

Answer ALL Questions

		Marks	K – Level	CO
11.	List any four commercial virtualization products.	2	K1	CO1
12.	Describe the taxonomy of virtualization technologies.	2	K2	CO1
13.	Define memory ballooning.	2	K1	CO2
14.	Illustrate with an example how memory sharing benefits VM performance.	2	K2	CO2
15.	List any two commercial examples of virtual networking platforms.	2	K1	CO3
16.	Identify the difference between centralized and distributed file systems.	2	K2	CO3
17.	Define clustering in the context of virtualization.	2	K1	CO4
18.	Illustrate how clustering improves performance in virtual environments.	2	K2	CO4
19.	What is desktop virtualization?	2	K1	CO5
20.	Discuss how virtualization supports grid and cloud computing.	2	K2	CO5

21.		Mention two key challenges in virtualized distributed computing.	2	K2	CO4
22.		Outline the workflow of VM provisioning in cloud data centres.	2	K2	CO5

PART - C (6 × 11 = 66 Marks)

Answer ALL Questions

23.	a)	Summarize how the hypervisor intercepts and emulates privileged instructions.	11	K2	CO1
		OR				
	b)	Examine how virtualization taxonomy helps classify modern VM architectures.	11	K2	CO1
24.	a)	Apply virtual storage techniques to optimize disk utilization in a cloud setup.	11	K3	CO2
		OR				
	b)	Utilize reclamation methods to free unused virtual memory space in VMware.	11	K3	CO2
25.	a)	Develop the I/O virtualization for an enterprise with suitable application.	11	K3	CO3
		OR				
	b)	Identify Virtual networking implementation to connect all systems and for communication in virtual environment.	11	K3	CO3
26.	a)	Discuss and use clustering concepts to enhance fault tolerance in a virtualized environment.	11	K2	CO4
		OR				
	b)	Illustrate distributed resource sharing among multiple nodes using virtualization.	11	K2	CO4
27.	a)	Apply virtualization techniques to deploy a distributed computing application on the cloud.	11	K3	CO5
		OR				
	b)	Organize how VM templates can be used to speed up provisioning in a cloud system.	11	K3	CO5
28.	a)	Explain the efficiency of virtual machine–based distributed systems for large-scale workloads.	11	K2	CO4
		OR				
	b)	Summarize how well current virtualization tools support distributed resource allocation.	11	K2	CO4