Infra Support
Basics of Operating Systems

1. **What is the primary role of system calls in an operating system?**

a) To provide an interface between user applications and hardware

b) To manage memory allocation

c) To schedule processes

d) To execute background tasks

Answer: a

2. **Which of the following is true about a process?**

a) A process can exist without a thread

b) A process is always associated with at least one thread

c) A process does not require resources like memory

d) A process cannot be scheduled by the CPU

Answer: b

3. **What is the primary difference between a process and a thread?**

a) Processes are lightweight, while threads are heavy-weight

b) Threads are independent entities, while processes are dependent

c) Threads share the same memory space, while processes do not

d) Processes cannot run concurrently, but threads can

Answer: c

4. **Which of the following is a type of inter-process communication (IPC)?**

a) Shared memory

b) Message passing

c) Semaphores

d) All of the above

Answer: d

5. **What is the term used for multiple threads executing in parallel?**

a) Synchronization

b) Concurrency

c) Blocking

d) Paging

Answer: b

6. **Which of the following statements is true about deadlocks?**

a) Deadlock occurs when all processes are in a blocked state

b) Deadlocks can only be avoided using mutexes

c) A deadlock is a situation where processes are stuck waiting for resources indefinitely

d) Deadlocks can be completely prevented by using semaphores

Answer: c

7. **Which of the following is the correct condition for a deadlock?**

a) Mutual exclusion, hold and wait, no preemption, and circular wait

b) Preemption, circular wait, and starvation

c) Mutual exclusion, no preemption, blocking

d) Circular wait, no preemption, and starvation

Answer: a

Memory Management and Virtual Memory

8. **What is the primary purpose of virtual memory?**

   a) To increase the amount of physical memory available

   b) To provide a continuous and private memory space for each process

   c) To improve CPU scheduling

   d) To reduce the need for system calls

   Answer: b

9. **What is paging in memory management?**

   a) Allocating memory in fixed-size blocks

b) Allocating memory in variable-sized blocks
c) A method of storing programs on disk
d) A technique for organizing memory for process management
Answer: a

10. **Which page replacement algorithm uses the least recent used page?**
a) FIFO
b) Optimal
c) LRU (Least Recently Used)
d) Random
Answer: c
11. **Which of the following is an advantage of the paging method in memory management?**
a) It eliminates external fragmentation
b) It allows processes to use larger memory than physically available
c) It reduces memory wastage
d) All of the above
Answer: d
12. **In a virtual memory system, the process sees memory as:**
a) A large single block
b) A continuous range of addresses
c) A divided space into segments
d) A fragmented heap of memory
Answer: b

CPU Scheduling Algorithms

13. **Which of the following CPU scheduling algorithms is non-preemptive?**
a) Round Robin
b) First-Come, First-Served (FCFS)
c) Shortest Job First (SJF)
d) Preemptive Priority Scheduling
Answer: b
14. **What is the primary drawback of the Shortest Job First (SJF) scheduling algorithm?**
a) It causes starvation for long processes
b) It cannot be implemented without prior knowledge of process burst times
c) It is not optimal for round-robin scheduling
d) It is very complex and difficult to manage
Answer: b
15. **In the Round Robin scheduling algorithm, how is the time slice or quantum typically set?**
a) Based on the number of processes
b) Arbitrarily by the operating system
c) Based on the priority of the processes
d) Based on the system's memory size
Answer: b
16. **Which CPU scheduling algorithm minimizes the average waiting time?**
a) First-Come, First-Served (FCFS)
b) Round Robin
c) Shortest Job First (SJF)
d) Priority Scheduling
Answer: c
17. **What is the main advantage of the Shortest Remaining Time First (SRTF) over SJF?**
a) It is a preemptive version of SJF
b) It allows for less context switching
c) It improves process fairness
d) It ensures no starvation
Answer: a

18. **Which of the following is true about the First-Come, First-Served (FCFS) scheduling algorithm?**
    a) It can result in the convoy effect where short processes are delayed by long ones
    b) It minimizes the average turnaround time
    c) It is always optimal in terms of response time
    d) It is the most complex CPU scheduling algorithm
    Answer: a

I/O Scheduling Algorithms

19. **What is the key principle behind the FCFS I/O scheduling algorithm?**
    a) Processes with the smallest I/O request are handled first
    b) Processes are handled in the order of their arrival
    c) I/O requests are handled in a round-robin fashion
    d) I/O requests are prioritized based on their size
    Answer: b
20. **Which of the following is a disadvantage of the SSTF (Shortest Seek Time First) algorithm?**
    a) It causes starvation for some requests
    b) It can be easily implemented
    c) It minimizes the total seek time
    d) It does not suffer from convoy effects
    Answer: a
21. **Which I/O scheduling algorithm works by moving the disk arm towards the end and then reversing direction once the end is reached?**
    a) FCFS
    b) SCAN
    c) LOOK
    d) CLOOK
    Answer: b
22. **What is the difference between the SCAN and LOOK disk scheduling algorithms?**
    a) SCAN moves the disk arm in one direction until it reaches the end, while LOOK moves to the farthest request and then reverses
    b) LOOK always moves from the center of the disk
    c) SCAN is based on FCFS, while LOOK uses SSTF
    d) There is no difference between the two
    Answer: a
23. **In the CLOOK (Circular LOOK) algorithm, the disk arm:** a) Moves in a circular path
    b) Moves to the end of the disk and then jumps back to the beginning without servicing any requests
    c) Moves towards the nearest request in a circular direction
    d) Only services requests in a one-way direction
    Answer: b

Types of Memories

1. **Which type of memory is directly accessible by the CPU for fast operations?**
    a) Main memory
    b) Cache memory
    c) Secondary storage
    d) Flash memory
    Answer: b
2. **Which memory type is typically used for storing permanent data?**
    a) Cache memory
    b) Main memory
    c) Secondary storage
    d) Registers
    Answer: c

3. **Which of the following is the fastest form of memory?**
   a) Main memory
   b) Cache memory
   c) Secondary storage
   d) Virtual memory
   Answer: b
4. **What is the primary role of cache memory in a computer system?**
   a) To store large data files
   b) To increase the speed of data access for frequently used programs and data
   c) To store the operating system
   d) To provide non-volatile storage
   Answer: b

Basics of Operating Systems

5. **Which of the following is not a system call type?**
   a) Process Control
   b) File Management
   c) Disk Scheduling
   d) Memory Management
   Answer: c
6. **Which system call is used to create a new process?**
   a) fork()
   b) exec()
   c) open()
   d) read()
   Answer: a
7. **Which type of system call involves creating a new file or deleting a file?**
   a) File Management
   b) Process Control
   c) Device Management
   d) Information Management
   Answer: a
8. **What is the main function of a thread?**
   a) To manage system resources
   b) To divide the CPU into smaller units
   c) To execute a part of the process
   d) To run the operating system kernel
   Answer: c
9. **Which of the following describes the main purpose of synchronization in an operating system?**
   a) To allow processes to run concurrently
   b) To ensure that processes execute in the correct order
   c) To increase the overall execution speed
   d) To minimize the number of processes in the system
   Answer: b

Memory Management and Virtual Memory

10. **What is the main purpose of memory management?**
    a) To allocate CPU time to processes
    b) To allocate and track memory used by processes
    c) To manage disk space
    d) To execute system calls
    Answer: b

11. **Which of the following is a benefit of virtual memory?**
    a) Increased disk space
    b) Increased access time for main memory
    c) A process can use more memory than physically available
    d) It improves CPU scheduling
    Answer: c
12. **What is the term used for the mapping between logical addresses and physical addresses in memory management?**
    a) Segmentation
    b) Paging
    c) Memory mapping
    d) Address binding
    Answer: d
13. **Which of the following is the main disadvantage of the FIFO page replacement algorithm?**
    a) It leads to high page fault rates
    b) It is the most complex algorithm
    c) It uses too much CPU time
    d) It is not compatible with virtual memory
    Answer: a
14. **Which of the following page replacement algorithms gives the best results in terms of the least page faults?**
    a) FIFO
    b) Optimal
    c) LRU
    d) Second Chance
    Answer: b

CPU Scheduling Algorithms

15. **Which of the following is the time complexity of the Round Robin CPU scheduling algorithm?**
    a) O(1)
    b) O(n)
    c) O(log n)
    d) O(n^2)
    Answer: b
16. **What is the primary advantage of the Shortest Job First (SJF) CPU scheduling algorithm?**
    a) It minimizes average waiting time
    b) It is easy to implement
    c) It handles long processes more efficiently
    d) It guarantees no starvation
    Answer: a
17. **Which scheduling algorithm is preemptive in nature?**
    a) First-Come, First-Served (FCFS)
    b) Round Robin
    c) Shortest Job First (SJF)
    d) Shortest Remaining Time First (SRTF)
    Answer: b
18. **In a priority scheduling algorithm, which of the following causes starvation?**
    a) High-priority processes always execute first
    b) Low-priority processes are never executed
    c) Processes with equal priority are executed in FCFS order
    d) All processes are executed in a round-robin manner
    Answer: b
19. **Which scheduling algorithm guarantees that each process gets an equal share of CPU time?**
    a) Round Robin

b) SJF
c) Priority Scheduling
d) FCFS
Answer: a

I/O Scheduling Algorithms

20. **Which I/O scheduling algorithm is best suited for reducing the seek time on a disk?**
    a) FCFS
    b) SSTF
    c) SCAN
    d) LOOK
    Answer: b
21. **Which of the following describes the SCAN disk scheduling algorithm?**
    a) The disk arm moves to the end, reverses direction, and services requests on the way back
    b) The disk arm moves to the closest request
    c) The disk arm services requests in one direction and stops
    d) The disk arm performs a circular motion
    Answer: a
22. **Which of the following I/O scheduling algorithms moves the disk arm towards the end and reverses direction only once?**
    a) FCFS
    b) CLOOK
    c) SCAN
    d) SSTF
    Answer: c
23. **What is the primary advantage of the LOOK algorithm over SCAN?**
    a) It reduces the seek time
    b) It eliminates the need for preemption
    c) It minimizes the CPU overhead
    d) It avoids unnecessary movement of the disk arm
    Answer: d
24. **Which disk scheduling algorithm is known for its circular seek behavior?**
    a) SCAN
    b) LOOK
    c) CLOOK
    d) SSTF
    Answer: c

Types of Memories

25. **Which type of memory is responsible for storing the operating system?**
    a) Cache memory
    b) Main memory (RAM)
    c) Secondary storage
    d) Register memory
    Answer: b
26. **Which of the following types of memory is the fastest?**
    a) Main memory
    b) Cache memory
    c) Secondary storage
    d) Virtual memory
    Answer: b
27. **Which of the following best describes the purpose of secondary storage?**
    a) To store data that is currently in use

b) To store temporary data for fast access
c) To store long-term data that persists even when the system is powered off
d) To store the operating system and applications
Answer: c

28. **Which of the following types of memory is directly connected to the CPU for fast data access?**
a) Cache memory
b) Main memory
c) Secondary storage
d) Register memory
Answer: a

29. **Which of the following memory types is volatile?**
a) Main memory (RAM)
b) Cache memory
c) Secondary storage
d) Flash memory
Answer: a

Memory Management Techniques

30. **Which of the following is an example of a page replacement algorithm?**
a) FIFO
b) SJF
c) SCAN
d) LOOK
Answer: a

31. **What happens during a page fault?**
a) The system crashes
b) A process is swapped out of memory
c) A process tries to access a page that is not in memory
d) The disk is completely full
Answer: c

32. **Which memory management technique allows non-contiguous allocation of memory to processes?**
a) Paging
b) Segmentation
c) Virtual memory
d) Fragmentation
Answer: a

33. **Which of the following describes the term "thrashing" in memory management?**
a) When the CPU is overused and the system crashes
b) When there is constant swapping of processes in and out of memory
c) When a process becomes blocked due to waiting for resources
d) When multiple processes share the same memory location
Answer: b

34. **Which of the following algorithms is used for page replacement in virtual memory systems?**
a) FIFO
b) SJF
c) SCAN
d) Round Robin
Answer: a

Basics of Virtual Machines

35. **What is the primary purpose of a Virtual Machine (VM)?**
a) To simulate a physical server
b) To manage network traffic
c) To store files securely
d) To run applications only

Answer: a

36. **Which hypervisor is installed directly on the host hardware?**
    a) Type 1 Hypervisor
    b) Type 2 Hypervisor
    c) Container-based Virtualization
    d) Hardware-assisted Virtualization
    Answer: a
37. **What is a Type 2 hypervisor?**
    a) A hypervisor that runs directly on the host hardware
    b) A hypervisor that runs on an operating system
    c) A hypervisor for managing containers
    d) A virtualization tool for cloud environments
    Answer: b
38. **What is the function of a hypervisor in virtualization?**
    a) It manages network connectivity
    b) It allocates physical resources to virtual machines
    c) It provides storage solutions for virtual machines
    d) It ensures security and access control
    Answer: b
39. **Which of the following is an advantage of using Virtual Machines?**
    a) They reduce the need for hardware
    b) They increase physical storage requirements
    c) They reduce the need for software updates
    d) They are limited in the number of supported applications
    Answer: a
40. **Which of the following is NOT a common virtual machine type?**
    a) Server VM
    b) Desktop VM
    c) Cloud VM
    d) Data VM
    Answer: d

Storage Solutions

41. **Which of the following is a characteristic of an SSD (Solid-State Drive)?**
    a) It has moving parts
    b) It is faster than HDD (Hard Disk Drive)
    c) It is slower than HDD
    d) It has a higher failure rate than HDD
    Answer: b
42. **What does RAID stand for in storage solutions?**
    a) Random Access Input Devices
    b) Redundant Array of Independent Disks
    c) Remote Array of Integrated Disks
    d) Redundant Allocation of Independent Data
    Answer: b
43. **Which RAID level provides fault tolerance through mirroring?**
    a) RAID 0
    b) RAID 1
    c) RAID 5
    d) RAID 10
    Answer: b
44. **Which of the following is the main advantage of using SSDs over HDDs?**
    a) SSDs are more durable and have no moving parts
    b) SSDs offer slower read/write speeds

c) SSDs are more prone to failure than HDDs
d) SSDs are cheaper than HDDs
Answer: a

45. **Which of the following storage solutions provides the highest read/write speed?**
a) HDD
b) SSD
c) Optical Disk
d) Magnetic Tape
Answer: b
46. **In storage, what does the term "latency" refer to?**
a) The capacity of the storage device
b) The speed at which data is written to the storage device
c) The delay before data transfer begins
d) The overall storage device reliability
Answer: c

Networking Components

47. **Which of the following is the function of a router in a network?**
a) To connect devices within the same local network
b) To route data between different networks
c) To manage memory usage for networked devices
d) To provide IP addresses to devices in the network
Answer: b
48. **What is the purpose of a switch in a computer network?**
a) To assign IP addresses to devices
b) To forward data between different networks
c) To forward data only to the intended recipient within a local network
d) To connect the network to the internet
Answer: c
49. **Which of the following is used to control network traffic and provide security?**
a) Hub
b) Router
c) Firewall
d) Switch
Answer: c
50. **Which of the following devices is responsible for assigning IP addresses in a network?**
a) Switch
b) Hub
c) DHCP Server
d) Router
Answer: c
51. **Which of the following is a characteristic of IPv6 compared to IPv4?**
a) IPv6 supports fewer addresses
b) IPv6 has a longer address space
c) IPv6 is less secure
d) IPv6 is not supported on most devices
Answer: b
52. **What does DNS stand for in networking?**
a) Digital Network Service
b) Domain Name System
c) Distributed Network Server
d) Data Network Storage
Answer: b

53. **Which protocol is used to securely transfer data over the internet?**
    a) HTTP
    b) FTP
    c) HTTPS
    d) SMTP
    Answer: c

Infra-related Concepts: Processors, Clock Cycle, Cache Memory

54. **What is the purpose of a processor's clock cycle?**
    a) To regulate the number of instructions executed per second
    b) To control the CPU's temperature
    c) To measure the CPU's voltage
    d) To control the data transfer between memory and CPU
    Answer: a
55. **Which of the following is the primary function of cache memory in a CPU?**
    a) To store instructions for faster access
    b) To store temporary data that is not needed immediately
    c) To store operating system files
    d) To manage disk I/O operations
    Answer: a
56. **What is the main difference between L1 and L2 cache memory?**
    a) L1 cache is faster and located closer to the CPU
    b) L2 cache is faster and located closer to the CPU
    c) L1 cache is larger than L2 cache
    d) L1 cache stores data for multiple processes, while L2 stores data for a single process
    Answer: a
57. **Which of the following best describes a processor's clock speed?**
    a) The number of instructions executed per second
    b) The number of operations per minute
    c) The maximum heat a CPU can generate
    d) The maximum amount of memory it can access
    Answer: a
58. **Which of the following is NOT a characteristic of an SSD (Solid-State Drive)?**
    a) Faster data access compared to HDD
    b) Uses NAND-based flash memory
    c) Has no moving parts
    d) Higher storage capacity than HDD
    Answer: d
59. **Which of the following is true about the impact of increasing CPU clock speed?**
    a) It decreases the number of instructions per second
    b) It increases power consumption and heat generation
    c) It reduces the need for cache memory
    d) It lowers the CPU's processing efficiency
    Answer: b

HDD vs SSD

60. **Which of the following is an advantage of HDD over SSD?**
    a) Faster read/write speed
    b) Less prone to failure
    c) Higher storage capacity for the same cost
    d) More energy efficient
    Answer: c

61. **Which of the following describes the primary function of HDD?**
    a) It stores data on rotating magnetic disks
    b) It stores data in flash memory
    c) It stores data using laser technology
    d) It stores data in volatile memory
    Answer: a
62. **Which of the following is a disadvantage of HDD?**
    a) It has slower read and write speeds compared to SSD
    b) It is more energy-efficient than SSD
    c) It has no moving parts
    d) It is more expensive than SSD
    Answer: a
63. **Which of the following factors most influences the performance of an SSD?**
    a) The RPM (Revolutions per minute)
    b) The NAND type and memory controller
    c) The size of the storage capacity
    d) The CPU clock speed
    Answer: b
64. **What type of storage is most commonly used in modern laptops and mobile devices due to its durability and speed?**
    a) HDD
    b) SSD
    c) Flash drives
    d) Optical drives
    Answer: b

Backup and Recovery Practices

65. What is the primary goal of a backup strategy?
    a) To minimize storage requirements
    b) To ensure business continuity in case of data loss
    c) To prevent unauthorized access to data
    d) To speed up system performance
    Answer: b
66. Which backup method only copies the files that have changed since the last backup?
    a) Full backup
    b) Incremental backup
    c) Differential backup
    d) Mirroring
    Answer: b
67. Which of the following is the fastest backup method?
    a) Full backup
    b) Differential backup
    c) Incremental backup
    d) Snapshot backup
    Answer: c
68. In a disaster recovery plan, which of the following is a critical component?
    a) Data encryption
    b) Automated backups
    c) Offsite backup storage
    d) Compression algorithms
    Answer: c
69. Which of the following backup types requires the least amount of storage space?
    a) Full backup
    b) Incremental backup

c) Differential backup
d) Snapshot backup
Answer: b

70. **What is a key disadvantage of using tape drives for backups?**
a) They are very fast compared to hard drives
b) They are cost-effective but slow for recovery
c) They have high capacity but low reliability
d) They are cloud-based and scalable
Answer: b

71. **Which of the following best describes a "point-in-time" backup?**
a) A backup that happens every minute
b) A backup of only the modified data
c) A backup that captures the system at a specific point in time
d) A backup that is scheduled weekly
Answer: c

72. **What does "restore" mean in the context of data backup?**
a) Deleting data that is no longer needed
b) Encrypting data before a backup
c) Recovering data from a backup
d) Compressing data to save storage space
Answer: c

73. **Which of the following backup methods would you use to ensure you can restore all data, but only need the last incremental backup and the full backup to do so?**
a) Full backup
b) Incremental backup
c) Differential backup
d) Snapshot backup
Answer: b

74. **Which type of backup stores only the data that has changed since the last full or incremental backup?**
a) Differential backup
b) Incremental backup
c) Mirrored backup
d) Full backup
Answer: a

Best Practices for Security and Compliance Controls

75. **Which of the following is a primary benefit of encryption for sensitive data?**
a) It speeds up data transmission
b) It ensures the confidentiality of the data
c) It compresses the data
d) It makes backups easier
Answer: b

76. **What is the principle of least privilege in security?**
a) Allowing users to access all system resources
b) Granting users the minimum access necessary to perform their job functions
c) Requiring multi-factor authentication for all users
d) Encrypting all communications by default
Answer: b

77. **Which of the following is an example of multi-factor authentication (MFA)?**
a) Username and password
b) Username, password, and a fingerprint scan
c) IP address validation

d) Using a password manager
Answer: b

78. **What is the main purpose of firewalls in network security?**
    a) To prevent unauthorized access to or from a network
    b) To track network performance
    c) To monitor system logs for suspicious activity
    d) To provide high availability for services
    Answer: a
79. **Which of the following is true about compliance regulations like GDPR or HIPAA?**
    a) They apply only to physical data storage
    b) They ensure data protection and privacy for individuals
    c) They only apply to cloud-based services
    d) They do not require any encryption or access control
    Answer: b
80. **Which of the following security measures helps in protecting against phishing attacks?**
    a) Regular system reboots
    b) Multi-factor authentication
    c) Enabling administrator privileges for all users
    d) Automatic file backups
    Answer: b
81. **Which of the following is the best practice for password management?**
    a) Using the same password for multiple services
    b) Using complex and unique passwords for each service
    c) Writing passwords down on paper
    d) Changing passwords once every two years
    Answer: b
82. **Which of the following is a key component of a security policy for cloud-based data storage?**
    a) Secure encryption of data both in transit and at rest
    b) Storing backups only on local disks
    c) Disabling all firewalls
    d) Allowing unlimited access to all users
    Answer: a
83. **What does it mean to "sanitize" data before disposal?**
    a) Compressing data to reduce storage requirements
    b) Deleting data but keeping backups
    c) Removing all data traces to prevent recovery
    d) Encrypting data to ensure it is unreadable
    Answer: c
84. **What is the role of an intrusion detection system (IDS) in security?**
    a) To block unauthorized access attempts
    b) To monitor and analyze network traffic for potential threats
    c) To provide backups of system data
    d) To encrypt sensitive files
    Answer: b

Windows and Unix/Linux Computing Environments

85. **Which of the following is a key difference between Windows and Unix/Linux?**
    a) Unix/Linux is primarily used for desktop environments
    b) Windows is more secure than Unix/Linux
    c) Unix/Linux is an open-source operating system
    d) Windows does not support multi-user environments
    Answer: c
86. **Which command in Unix/Linux is used to list files in a directory?**
    a) ls

b) dir
c) list
d) show
Answer: a

87. **Which of the following commands is used in Windows to check and repair system files?**
a) chkdsk
b) sfc /scannow
c) fixmbr
d) diskpart
Answer: b
88. **Which of the following file systems is commonly used in Unix/Linux environments?**
a) NTFS
b) FAT32
c) ext4
d) HFS+
Answer: c
89. **Which of the following is the default shell in most Unix/Linux distributions?**
a) CMD
b) PowerShell
c) Bash
d) Zsh
Answer: c
90. **Which of the following is true about Windows registry?**
a) It is a configuration database for the operating system and applications
b) It stores user files
c) It manages memory allocation
d) It controls network traffic
Answer: a
91. **Which of the following commands is used in Windows to change the directory?**
a) cd
b) change
c) dir
d) list
Answer: a
92. **Which of the following best describes the Linux kernel?**
a) A graphical user interface
b) The core part of the operating system that manages system resources
c) A text editor
d) A file system utility
Answer: b
93. **Which of the following utilities is used in Windows to schedule tasks automatically?**
a) Task Scheduler
b) Cron
c) Autostart
d) Event Viewer
Answer: a
94. **Which of the following tools is commonly used for package management in Linux?**
a) apt
b) yum
c) pacman
d) All of the above
Answer: d

Networking

Types of Networks (LAN, WAN, MAN, etc.)

1. Which of the following is a characteristic of a Local Area Network (LAN)?
a) It covers a large geographic area
b) It connects computers within a limited geographic area such as a building
c) It uses satellites for communication
d) It is typically used for international communication
Answer: b

2. Which of the following types of networks is most suitable for connecting multiple cities?
a) LAN
b) MAN
c) WAN
d) PAN
Answer: c

3. Which of the following is the main purpose of a Metropolitan Area Network (MAN)?
a) To connect a home network to the internet
b) To connect devices within a single building
c) To connect a group of networks in a large city
d) To connect personal devices like phones and laptops
Answer: c

4. Which of the following networks spans the smallest geographical area?
a) WAN
b) LAN
c) MAN
d) PAN
Answer: b

5. What is the primary difference between a WAN and a LAN?
a) WAN uses fiber optic cables, while LAN uses copper cables
b) WAN covers a larger geographical area, while LAN covers a smaller area
c) LAN is wireless, and WAN is wired
d) WAN is used in home environments, while LAN is used in businesses
Answer: b

6. Which network type would be most suitable for connecting computers across the globe?
a) LAN
b) MAN
c) WAN
d) PAN
Answer: c

7. Which of the following is NOT a feature of LAN?
a) It is faster than WAN
b) It is typically used in offices or homes
c) It covers a large geographical area
d) It uses Ethernet cables for communication
Answer: c

8. Which network connects devices within a single room or building?
a) LAN
b) WAN
c) MAN
d) PAN
Answer: a

9. Which of the following is most suitable for connecting an office campus within a city?
a) LAN
b) MAN
c) WAN
d) PAN

Answer: b

10. **Which type of network typically uses private leased lines?**

a) LAN
b) MAN
c) WAN
d) PAN

Answer: c

Network Topologies (Ring, Mesh, Bus, Star, etc.)

11. **In which network topology are all devices connected to a single central point, like a hub or switch?**
    a) Ring topology
    b) Star topology
    c) Mesh topology
    d) Bus topology
    Answer: b
12. **Which network topology is known for its robustness and redundancy due to multiple paths between devices?**
    a) Bus topology
    b) Mesh topology
    c) Ring topology
    d) Star topology
    Answer: b
13. **In which network topology does each device have two connections to neighboring devices, forming a loop?**
    a) Bus topology
    b) Ring topology
    c) Star topology
    d) Mesh topology
    Answer: b
14. **Which of the following is the main advantage of a star topology?**
    a) High fault tolerance due to multiple paths
    b) Easy to set up and expand
    c) Requires less cabling than bus topology
    d) All devices can communicate simultaneously
    Answer: b
15. **Which network topology requires the least amount of cabling?**
    a) Star topology
    b) Bus topology
    c) Mesh topology
    d) Ring topology
    Answer: b
16. **Which topology would be most suitable for a network where high fault tolerance and redundancy are important?**
    a) Ring topology
    b) Bus topology
    c) Mesh topology
    d) Star topology
    Answer: c
17. **Which of the following best describes the bus topology?**
    a) All devices are connected to a central hub or switch
    b) Devices are connected in a circular fashion
    c) A single cable connects all devices in a linear manner

d) Devices are connected with multiple paths
Answer: c

18. **Which of the following is a disadvantage of ring topology?**
    a) It is difficult to expand
    b) If one device fails, the entire network can go down
    c) It requires more cabling than other topologies
    d) It has low fault tolerance
    Answer: b
19. **Which topology connects each device to every other device on the network?**
    a) Star topology
    b) Mesh topology
    c) Bus topology
    d) Ring topology
    Answer: b
20. **In a mesh topology, if one connection fails, what happens?**
    a) The whole network goes down
    b) The affected device becomes inoperable
    c) The network continues to function due to multiple paths
    d) The affected device is isolated and disconnected
    Answer: c

Network Devices (Hub, Bridge, Routers, Gateway, etc.)

1. **Which of the following devices operates at the physical layer and broadcasts data to all connected devices?**
    a) Hub
    b) Router
    c) Switch
    d) Bridge
    Answer: a
2. **Which device is used to connect two different networks, such as a local network to the internet?**
    a) Hub
    b) Switch
    c) Router
    d) Bridge
    Answer: c
3. **Which network device is used to filter traffic between two segments of a network, making decisions based on MAC addresses?**
    a) Router
    b) Switch
    c) Bridge
    d) Hub
    Answer: c
4. **What is the primary function of a gateway in a network?**
    a) To connect different network types (e.g., LAN to WAN)
    b) To connect devices in the same network
    c) To route data within the same network
    d) To amplify the signal across distances
    Answer: a
5. **Which of the following devices is responsible for forwarding data packets between different networks based on IP addresses?**
    a) Hub
    b) Bridge
    c) Router

d) Switch

Answer: c

6. **Which device works at the data link layer and is used to divide a large network into smaller segments to reduce traffic?**
   a) Router
   b) Hub
   c) Switch
   d) Bridge
   Answer: d
7. **Which device operates at the data link layer and forwards data based on MAC addresses?**
   a) Router
   b) Switch
   c) Hub
   d) Gateway
   Answer: b
8. **Which device can both filter traffic and reduce collisions in a network?**
   a) Hub
   b) Bridge
   c) Switch
   d) Gateway
   Answer: c
9. **Which device amplifies and retransmits signals over long distances in a network?**
   a) Router
   b) Switch
   c) Hub
   d) Repeater
   Answer: d
10. **What is the main function of a network switch?**
    a) To connect multiple devices in a network
    b) To broadcast data to all devices on the network
    c) To route traffic between different networks
    d) To amplify the signal over long distances
    Answer: a

OSI Data Model and TCP/IP Model

11. **Which of the following is the correct order of layers in the OSI model?**
    a) Application, Transport, Network, Data Link, Physical
    b) Physical, Data Link, Network, Transport, Application
    c) Transport, Network, Data Link, Application, Physical
    d) Data Link, Physical, Transport, Network, Application
    Answer: b
12. **Which OSI layer is responsible for ensuring reliable data transfer between two systems?**
    a) Physical
    b) Data Link
    c) Transport
    d) Application
    Answer: c
13. **Which layer of the OSI model deals with the physical transmission of data over a communication medium?**
    a) Data Link
    b) Physical
    c) Network
    d) Transport
    Answer: b
14. **In the OSI model, which layer is responsible for logical addressing and routing?**

a) Transport
b) Data Link
c) Network
d) Application
Answer: c

15. **Which of the following is the main function of the Transport layer in the OSI model?**
    a) Establishing, maintaining, and terminating communication sessions
    b) Routing data to its destination
    c) Providing error control and flow control
    d) Encapsulating data into packets
    Answer: c
16. **Which protocol is used for reliable communication in the Transport layer of the TCP/IP model?**
    a) IP
    b) UDP
    c) TCP
    d) ICMP
    Answer: c
17. **Which layer in the TCP/IP model is responsible for providing end-to-end communication and error recovery?**
    a) Application
    b) Transport
    c) Network
    d) Link
    Answer: b
18. **What is the key difference between the OSI model and the TCP/IP model?**
    a) The OSI model has 7 layers, while the TCP/IP model has 5 layers
    b) The OSI model uses IP addressing, while TCP/IP uses MAC addressing
    c) The OSI model is more widely used than the TCP/IP model
    d) The TCP/IP model is used for both the internet and local area networks
    Answer: a
19. **Which layer of the TCP/IP model corresponds to the Data Link layer in the OSI model?**
    a) Network Layer
    b) Application Layer
    c) Link Layer
    d) Transport Layer
    Answer: c
20. **Which layer in the OSI model is responsible for the encryption and decryption of data?**
    a) Application
    b) Presentation
    c) Transport
    d) Session
    Answer: b

Subnets and Supernets

21. **What is the main purpose of subnetting?**
    a) To enhance the security of the network
    b) To split a large network into smaller, more manageable segments
    c) To assign unique IP addresses to each host
    d) To combine multiple networks into one
    Answer: b
22. **What is the network address of the subnet 192.168.10.0/24?**
    a) 192.168.10.0
    b) 192.168.10.255
    c) 255.255.255.0

d) 192.168.10.255

Answer: a

23. **What is a supernet?**
    a) A network with smaller subnets
    b) A larger network formed by aggregating smaller networks
    c) A special type of network used for routing
    d) A subnet with only a few hosts
    Answer: b
24. **Which of the following is true about subnetting?**
    a) Subnetting reduces the number of networks
    b) Subnetting allows for more efficient use of IP addresses
    c) Subnetting is used to convert IPv6 addresses to IPv4
    d) Subnetting eliminates the need for routing
    Answer: b
25. **What does the CIDR notation /24 mean in an IP address like 192.168.10.0/24?**
    a) It represents the number of host bits in the IP address
    b) It indicates the number of subnets in the network
    c) It represents the number of network bits in the IP address
    d) It represents the class of the IP address
    Answer: c
26. **What is the purpose of a subnet mask?**
    a) To define the IP address range for a network
    b) To determine how much data a network can carry
    c) To divide an IP address into network and host portions
    d) To identify the type of device in the network
    Answer: c
27. **In the subnet 255.255.255.0, how many subnets can be created with a /26 subnet mask?**
    a) 2
    b) 4
    c) 8
    d) 16
    Answer: b
28. **Which of the following is the first address in a subnet?**
    a) Broadcast address
    b) Network address
    c) Usable host address
    d) Subnet mask
    Answer: b
29. **Which of the following is an example of a Supernet?**
    a) 192.168.1.0/24
    b) 192.168.0.0/23
    c) 192.168.2.0/24
    d) 192.168.1.0/26
    Answer: b
30. **What is the range of IP addresses in the subnet 192.168.1.0/30?**
    a) 192.168.1.0 - 192.168.1.255
    b) 192.168.1.1 - 192.168.1.254
    c) 192.168.1.0 - 192.168.1.3
    d) 192.168.1.4 - 192.168.1.7
    Answer: c

UDP, TCP, Sockets, and Ports

31. **Which of the following is a key difference between TCP and UDP?**
    a) TCP is connectionless, while UDP is connection-oriented

b) UDP provides error recovery, while TCP does not
c) TCP is reliable, while UDP is unreliable
d) UDP guarantees the order of data, while TCP does not
Answer: c

32. **Which protocol provides reliable, connection-oriented communication?**
a) UDP
b) IP
c) TCP
d) ARP
Answer: c

33. **Which of the following is true about UDP?**
a) It guarantees data delivery
b) It is slower than TCP
c) It is connectionless and does not guarantee delivery
d) It is used for applications that require guaranteed delivery
Answer: c

34. **What is the main function of a socket in networking?**
a) To manage the transmission of packets
b) To provide a software interface for communication over the network
c) To assign IP addresses to devices
d) To determine the routing path of data
Answer: b

35. **Which of the following is a well-known port used by HTTP?**
a) 21
b) 80
c) 443
d) 25
Answer: b

36. **Which of the following protocols uses port 443 by default?**
a) HTTP
b) FTP
c) HTTPS
d) SMTP
Answer: c

37. **Which port does the DNS service commonly use?**
a) 80
b) 443
c) 53
d) 21
Answer: c

38. **What is the primary role of a port in networking?**
a) To uniquely identify the network device
b) To establish communication between two networks
c) To identify a specific process or service on a device
d) To prevent data collisions in the network
Answer: c

39. **Which TCP/IP protocol uses port 22 by default?**
a) HTTP
b) FTP
c) SSH
d) Telnet
Answer: c

40. **Which of the following is true about a socket?**
a) A socket is an endpoint for communication between two machines
b) A socket only supports UDP communication

c) A socket is always bound to a single IP address
d) A socket always requires a connection to the Internet
Answer: a

IPv4 vs IPv6

1. **Which of the following is a primary difference between IPv4 and IPv6?**
   a) IPv4 has a 128-bit address space, while IPv6 has a 32-bit address space
   b) IPv4 addresses are written in hexadecimal, while IPv6 addresses are written in decimal
   c) IPv4 uses dotted decimal notation, while IPv6 uses hexadecimal notation
   d) IPv4 provides better security than IPv6
   Answer: c

2. **How many bits are there in an IPv4 address?**
a) 32 bits
b) 64 bits
c) 128 bits
d) 256 bits
Answer: a
3. **What is the size of an IPv6 address?**
a) 32 bits
b) 128 bits
c) 64 bits
d) 256 bits
Answer: b
4. **Which of the following is a reason for the transition from IPv4 to IPv6?**
a) IPv6 is less secure than IPv4
b) IPv6 supports a larger address space than IPv4
c) IPv4 provides better performance
d) IPv6 requires more memory than IPv4
Answer: b
5. **What is the purpose of the IPv6 address `::1`?**
a) It is used for loopback testing
b) It is a reserved address for network communication
c) It is used for broadcasting
d) It is used for network identification
Answer: a
6. **What is the main benefit of using IPv6 over IPv4?**
a) Larger address space
b) Faster transmission speed
c) Reduced security risk
d) Simplified routing protocols
Answer: a
7. **Which of the following is true about IPv6 addresses?**
a) IPv6 addresses use 16-byte octets
b) IPv6 addresses are written in binary format
c) IPv6 uses a 32-bit address for host identification
d) IPv6 addresses are always dynamic
Answer: a
8. **Which IPv4 address class is used for multicast communication?**
a) Class A
b) Class B
c) Class C
d) Class D
Answer: d

9. What is the subnet mask for an IPv6 address with a `/64` prefix?

a) 255.255.255.0

b) 255.255.255.255

c) ffff:ffff:ffff:ffff::

d) /32

Answer: c

10. Which of the following IPv6 addresses is reserved for local communication within a network?

a) fc00::/7

b) fe80::/10

c) 2001::/16

d) 2400::/8

Answer: b

Classless Inter-Domain Routing (CIDR)

11. **What does the CIDR notation `192.168.1.0/24` represent?**
    a) A network address of `192.168.1.0` with a subnet mask of `255.255.255.0`
    b) A host address of `192.168.1.0`
    c) A class B network with `192.168.1.0` as the network address
    d) A broadcast address of `192.168.1.0`
    Answer: a
12. **Which of the following is true about CIDR notation?**
    a) CIDR allows for the allocation of IP addresses more efficiently
    b) CIDR notation always uses classful boundaries
    c) CIDR notation only applies to IPv6 addresses
    d) CIDR was created to reduce the size of routing tables in the global Internet
    Answer: a
13. **What is the CIDR notation for the subnet mask `255.255.254.0`?**
    a) /24
    b) /25
    c) /23
    d) /22
    Answer: c
14. **In the CIDR notation `10.0.0.0/8`, what does the `/8` represent?**
    a) The size of the IP address in bits
    b) The number of bits used for the network portion of the address
    c) The subnet mask
    d) The broadcast address
    Answer: b
15. **Which of the following is the main advantage of CIDR over traditional classful addressing?**
    a) CIDR simplifies the allocation of IP addresses
    b) CIDR reduces the size of routing tables
    c) CIDR improves network security
    d) CIDR restricts the number of available IP addresses
    Answer: b

IP Support Protocols: ARP, DHCP, ICMP, NAT

16. **What is the primary function of ARP (Address Resolution Protocol)?**
    a) To convert a domain name to an IP address
    b) To map a MAC address to an IP address
    c) To establish a secure connection between devices
    d) To find the IP address of a remote server
    Answer: b
17. **Which protocol is used to dynamically assign IP addresses to hosts on a network?**
    a) ARP

b) DHCP
c) DNS
d) ICMP
Answer: b

18. **Which protocol does ICMP (Internet Control Message Protocol) use to test connectivity?**
    a) Traceroute
    b) PING
    c) Telnet
    d) FTP
    Answer: b
19. **What does NAT (Network Address Translation) do?**
    a) It assigns IP addresses to devices on a network
    b) It translates private IP addresses to public IP addresses
    c) It allocates IP addresses to DHCP clients
    d) It ensures the security of network communication
    Answer: b
20. **Which of the following is a common use of NAT?**
    a) Preventing unauthorized access to the network
    b) Managing the routing of IP addresses in the Internet
    c) Assigning dynamic IP addresses to hosts
    d) Allowing multiple devices on a local network to share a single public IP address
    Answer: d

Application Layer Protocols: DNS, SMTP, HTTP, FTP, etc.

21. **Which protocol is responsible for resolving domain names to IP addresses?**
    a) SMTP
    b) FTP
    c) DNS
    d) HTTP
    Answer: c
22. **Which of the following protocols is used for sending email?**
    a) HTTP
    b) FTP
    c) SMTP
    d) POP3
    Answer: c
23. **Which HTTP status code indicates a successful request?**
    a) 200
    b) 404
    c) 500
    d) 301
    Answer: a
24. **What is the default port number for HTTP?**
    a) 25
    b) 80
    c) 443
    d) 21
    Answer: b
25. **Which of the following protocols is used for secure communication over the Internet?**
    a) HTTP
    b) FTP
    c) HTTPS
    d) SMTP
    Answer: c

26. **Which of the following is true about FTP (File Transfer Protocol)?**
    a) FTP uses the same port number for both data transfer and control commands
    b) FTP is used to send and receive emails
    c) FTP uses port 21 for communication
    d) FTP is a connectionless protocol
    Answer: c
27. **Which of the following protocols is primarily used for retrieving emails from a server?**
    a) SMTP
    b) POP3
    c) DNS
    d) IMAP
    Answer: b
28. **What is the purpose of the SMTP protocol?**
    a) To retrieve emails from a server
    b) To send emails from a client to a mail server
    c) To securely transfer files
    d) To resolve domain names to IP addresses
    Answer: b
29. **Which of the following is the main difference between POP3 and IMAP?**
    a) POP3 stores emails on the server, while IMAP downloads them to the client
    b) IMAP provides more advanced features like folder management and email syncing
    c) POP3 is used for sending emails, while IMAP is used for receiving emails
    d) IMAP requires more bandwidth than POP3
    Answer: b
30. **Which of the following is true about DNS?**
    a) DNS translates IP addresses into domain names
    b) DNS uses port 443 for communication
    c) DNS is used to send emails
    d) DNS is a transport layer protocol
    Answer: a

Firewall, Access Control, and Remote Access VPN

1. Firewall

1. **What is the primary purpose of a firewall in network security?**

a) To prevent unauthorized access to a network
b) To monitor network performance
c) To encrypt sensitive data
d) To block advertisements
Answer: a

2. **Which of the following is a common type of firewall?**

a) Static firewall
b) Stateful inspection firewall
c) Dynamic firewall
d) Application firewall
Answer: b

3. **What does a packet-filtering firewall do?**

a) It inspects each packet passing through the network and decides whether to allow or block it based on rules
b) It filters packets based on their source IP address only
c) It encrypts packets before transmission
d) It replaces data packets with encrypted versions
Answer: a

4. **Which type of firewall works by examining the state of active connections?**

a) Circuit-level gateway

b) Packet filtering firewall
c) Stateful inspection firewall
d) Proxy firewall
Answer: c

5. **Which of the following firewall types operates at the application layer and can filter specific application protocols?**

a) Stateful inspection firewall
b) Proxy firewall
c) Packet-filtering firewall
d) NAT firewall
Answer: b

6. **A firewall that examines traffic at Layer 3 and 4 of the OSI model is most likely a:**

a) Packet filtering firewall
b) Stateful inspection firewall
c) Deep packet inspection firewall
d) Application firewall
Answer: a

7. **Which of the following is a limitation of a packet-filtering firewall?**

a) It does not inspect the content of packets
b) It is slower than stateful firewalls
c) It cannot handle IPsec traffic
d) It requires high processing power
Answer: a

8. **What is the function of a proxy firewall?**

a) It inspects and modifies packets at the network layer
b) It provides secure remote access for users
c) It filters content and can act as an intermediary between users and the services they wish to access
d) It is only used for blocking malicious IP addresses
Answer: c

9. **Which of the following is a commonly used firewall rule?**

a) Block all inbound traffic and allow outbound traffic
b) Allow all traffic and deny outbound traffic
c) Allow all inbound traffic and block outbound traffic
d) Allow all types of traffic, regardless of source or destination
Answer: a

10. **Which firewall type operates at Layer 7 of the OSI model?**

a) Stateful inspection firewall
b) Packet-filtering firewall
c) Application firewall
d) Circuit-level firewall
Answer: c

2. Access Control

11. **What is the primary objective of access control in network security?**

a) To grant users the ability to access all network resources
b) To prevent unauthorized access and ensure that only authorized users can access certain resources
c) To block all types of network traffic
d) To encrypt sensitive data
Answer: b

12. **Which of the following is an example of discretionary access control (DAC)?**

a) A user with admin privileges can control access to files and resources
b) Access control decisions are based on predefined security levels
c) Access rights are based on roles and responsibilities

d) Access control is based on mandatory security policies

Answer: a

13. **What is Role-Based Access Control (RBAC)?**
    a) Access is granted based on the identity of the user
    b) Access is granted based on predefined roles within an organization
    c) Access is granted based on time of day
    d) Access is granted based on the device being used
    Answer: b
14. **Which of the following is a key component of Mandatory Access Control (MAC)?**
    a) Users can change access control policies
    b) Access is determined by the system based on predefined rules
    c) Access is granted by user role
    d) Access is granted by user permissions only
    Answer: b
15. **In which of the following scenarios would Discretionary Access Control (DAC) be most appropriate?**
    a) When users need to control access to their own files
    b) When access must be strictly controlled by an external authority
    c) When access is determined by roles
    d) When access to sensitive data is based on policies set by administrators
    Answer: a
16. **What is the principle of "least privilege" in access control?**
    a) Granting users the minimum level of access necessary to perform their job functions
    b) Granting users access to all resources on a network
    c) Allowing users to grant access to other users
    d) Giving every user the same access rights
    Answer: a
17. **Which of the following is an example of a biometric access control method?**
    a) Username and password
    b) Smart cards
    c) Fingerprint recognition
    d) IP address filtering
    Answer: c
18. **What does the term "access control list" (ACL) refer to?**
    a) A list of users who are authorized to access the network
    b) A list of files on a server that need to be encrypted
    c) A list of rules that defines which users or devices can access certain resources
    d) A list of network protocols available for a user
    Answer: c
19. **Which of the following is a commonly used access control model for cloud computing?**
    a) Time-based access control
    b) Role-Based Access Control (RBAC)
    c) File-level access control
    d) Multi-factor authentication (MFA)
    Answer: b
20. **What is the role of Multi-Factor Authentication (MFA) in access control?**
    a) It allows users to authenticate using only their password
    b) It requires the use of two or more methods of authentication
    c) It encrypts data during transmission
    d) It automatically grants access to all users
    Answer: b

3. Remote Access VPN

21. **What is the primary purpose of a Remote Access VPN (Virtual Private Network)?**
    a) To provide internet access to users while they are working remotely
    b) To create a secure connection for remote workers to access an organization’s internal network

c) To restrict access to external websites
d) To encrypt local network traffic only
Answer: b

22. **Which of the following is a common protocol used to establish a VPN connection?**
    a) HTTP
    b) IPsec
    c) FTP
    d) SMTP
    Answer: b
23. **Which of the following VPN protocols is used for providing secure connections using SSL/TLS?**
    a) L2TP
    b) OpenVPN
    c) PPTP
    d) IPsec
    Answer: b
24. **What does a VPN do to protect data transmitted over a public network?**
    a) It provides redundancy
    b) It encrypts the data for secure transmission
    c) It routes the data to a proxy server
    d) It reduces the packet size
    Answer: b
25. **Which VPN technology uses tunnels to encrypt traffic between two endpoints?**
    a) SSL VPN
    b) MPLS
    c) IPsec VPN
    d) PPTP
    Answer: c
26. **What is a split tunneling feature in a VPN?**
    a) It prevents VPN traffic from entering and leaving the same network
    b) It allows some traffic to go through the VPN and other traffic to go directly to the internet
    c) It redirects all traffic to a central server
    d) It increases the network bandwidth
    Answer: b
27. **Which of the following is NOT a benefit of using a VPN?**
    a) Enhances security by encrypting data
    b) Allows users to access the internet anonymously
    c) Reduces the risk of cyberattacks
    d) Improves network performance
    Answer: d
28. **Which type of VPN allows access to the internal network resources from any device with an internet connection?**
    a) Site-to-Site VPN
    b) Remote Access VPN
    c) Intranet VPN
    d) SSL VPN
    Answer: b
29. **Which of the following is a disadvantage of using a Remote Access VPN?**
    a) It requires no encryption
    b) It reduces the security of internal network communications
    c) It can introduce latency and slow down internet speeds
    d) It does not require user authentication
    Answer: c
30. **Which is an example of a use case for a Remote Access VPN?**
    a) Securely connecting two branch offices
    b) Allowing a remote employee to securely access company resources

c) Securing DNS queries
d) Blocking malicious IP addresses
Answer: b

Cloud

Cloud Computing Overview

1. **What is cloud computing?**
   a) Storing data on personal hard drives
   b) Running software applications only on a personal computer
   c) Delivering computing services (storage, processing, etc.) over the internet
   d) Storing files on a USB drive
   Answer: c
2. **Which of the following is NOT a primary benefit of cloud computing?**

a) Scalability
b) High upfront costs
c) Flexibility
d) Remote accessibility
Answer: b

3. **Which type of cloud deployment model provides services over the internet to the general public?**

a) Private Cloud
b) Hybrid Cloud
c) Community Cloud
d) Public Cloud
Answer: d

4. **Which of the following is an example of cloud computing infrastructure?**

a) A private data center
b) A distributed network of servers
c) A personal computer
d) A local network server
Answer: b

5. **What is the main advantage of using cloud computing over traditional on-premise computing?**

a) Lower upfront investment
b) Limited availability
c) More secure
d) Less reliable
Answer: a

2. Characteristics of Cloud Computing

6. **Which of the following is a key characteristic of cloud computing?**
   a) Limited scalability
   b) On-demand self-service
   c) Increased maintenance costs
   d) Fixed capacity
   Answer: b
7. **Which cloud characteristic refers to the ability to scale resources up or down as needed?**
   a) Rapid elasticity
   b) On-demand self-service
   c) Broad network access
   d) Resource pooling
   Answer: a
8. **What does multi-tenancy mean in the context of cloud computing?**
   a) Multiple users sharing the same server resources in a secure and isolated manner
   b) Each user has their own dedicated server

c) A single server is used by a single organization
d) The cloud services are hosted on multiple networks
Answer: a

9. **What does the 'Broad network access' characteristic of cloud computing refer to?**
   a) Cloud services are available only in specific geographic locations
   b) Cloud services are accessible through different devices over the internet
   c) Only high-speed networks can access cloud services
   d) Cloud services are accessible through a private network
   Answer: b
10. **What is the 'Measured Service' characteristic in cloud computing?**
    a) Only specific services are available for use
    b) Resources are metered and billed based on usage
    c) Cloud computing is available without cost
    d) Services are limited to a set amount of resources
    Answer: b
11. **Which of the following is NOT a benefit of the "On-demand self-service" feature of cloud computing?**
    a) Resources can be provisioned as needed
    b) No need for manual intervention by service providers
    c) Immediate scalability
    d) Resources are fixed and unchangeable
    Answer: d
12. **What does "resource pooling" refer to in cloud computing?**
    a) Resources are distributed across a physical data center
    b) A single user controls a pool of resources
    c) Cloud providers use shared resources to serve multiple customers
    d) Resources are divided into private and public sections
    Answer: c
13. **Which of the following is a characteristic of cloud computing that helps reduce costs for businesses?**
    a) Fixed billing
    b) Resource pooling and sharing
    c) High upfront investment
    d) Lack of scalability
    Answer: b
14. **Which of the following ensures that cloud services are always available, regardless of user location?**
    a) Internet bandwidth
    b) Broad network access
    c) Data encryption
    d) Scalability
    Answer: b
15. **Which of the following best describes the elasticity characteristic of cloud computing?**
    a) Ability to increase or decrease resources based on demand
    b) Ability to maintain the same level of service regardless of load
    c) Resources are fixed
    d) Services are available for a specific number of users
    Answer: a

3. Types of Cloud Services (SaaS, PaaS, IaaS)

16. **Which of the following is a key feature of Software as a Service (SaaS)?**
    a) Users manage and control infrastructure resources
    b) Users only interact with the application and data
    c) Users deploy their own software

d) Users manage virtual machines

Answer: b

17. **Which of the following is an example of a SaaS application?**
    a) Google Drive
    b) Amazon Web Services (AWS) EC2
    c) Microsoft Azure
    d) Docker
    Answer: a
18. **Which cloud service model allows users to rent IT infrastructure such as virtual machines and storage?**
    a) Software as a Service (SaaS)
    b) Platform as a Service (PaaS)
    c) Infrastructure as a Service (IaaS)
    d) Network as a Service (NaaS)
    Answer: c
19. **What does Platform as a Service (PaaS) provide to users?**
    a) Complete software applications
    b) Virtualized computing resources
    c) Development tools for creating applications without managing underlying infrastructure
    d) Storage space for data backup
    Answer: c
20. **Which of the following is an example of a PaaS offering?**
    a) Google App Engine
    b) Microsoft 365
    c) Dropbox
    d) AWS EC2
    Answer: a
21. **What does IaaS stand for?**
    a) Infrastructure as a Service
    b) Information as a Service
    c) Internet as a Service
    d) Integration as a Service
    Answer: a
22. **Which of the following is an example of Infrastructure as a Service (IaaS)?**
    a) Microsoft Azure Virtual Machines
    b) Salesforce
    c) Dropbox
    d) AWS Lambda
    Answer: a
23. **Which cloud service model provides the most flexibility to users in terms of managing their computing resources?**
    a) SaaS
    b) PaaS
    c) IaaS
    d) NaaS
    Answer: c
24. **Which of the following cloud service models is used for hosting software applications and managing their associated infrastructure?**
    a) SaaS
    b) PaaS
    c) IaaS
    d) NaaS
    Answer: b
25. **What is a benefit of using SaaS over traditional software?**
    a) No need for installation or maintenance by users

b) Users manage the infrastructure resources
c) Users can customize the application code
d) No internet connection is required
Answer: a

26. **Which of the following is a key advantage of IaaS?**
    a) Fully managed applications
    b) Customizable infrastructure without managing physical hardware
    c) Fully managed software
    d) Pre-built databases for instant use
    Answer: b
27. **Which of the following is the primary responsibility of users in a PaaS environment?**
    a) Managing the underlying hardware
    b) Developing and deploying applications
    c) Managing the virtualized hardware
    d) Securing the network
    Answer: b
28. **Which cloud model is most suitable for organizations that need to scale their application hosting environments rapidly?**
    a) IaaS
    b) PaaS
    c) SaaS
    d) DaaS
    Answer: a
29. **Which type of cloud service would a company choose to run a custom application without having to worry about managing the underlying infrastructure?**
    a) IaaS
    b) PaaS
    c) SaaS
    d) A hybrid model
    Answer: b
30. **Which cloud service model is most commonly used for providing email services like Gmail or Office 365?**
    a) IaaS
    b) PaaS
    c) SaaS
    d) None of the above
    Answer: c

Public vs Private Cloud

1. **Which of the following is a key characteristic of a public cloud?**
    a) Exclusive use by a single organization
    b) Hosted and managed by a third-party provider
    c) Accessed only by a private network
    d) Always on-premises
    Answer: b
2. **Which of the following is a feature of a private cloud?**
    a) Shared resources across multiple organizations
    b) Managed by an external cloud provider
    c) Exclusively used by a single organization
    d) Less secure than public cloud
    Answer: c
3. **Which of the following is true for a hybrid cloud?**
    a) It combines public cloud and private cloud environments
    b) It is only accessible via a private network

c) It operates solely on-premises
d) It does not require internet access
Answer: a

4. **What is the main advantage of a private cloud over a public cloud?**
   a) Greater scalability
   b) Higher cost
   c) More security and control over data
   d) Limited access
   Answer: c
5. **Which of the following is NOT a disadvantage of the public cloud?**
   a) Limited control over data security
   b) Increased scalability
   c) Limited customization
   d) Possible data privacy concerns
   Answer: b
6. **Which deployment model provides a mix of both private and public cloud resources?**
   a) Hybrid Cloud
   b) Multi-cloud
   c) Private Cloud
   d) Community Cloud
   Answer: a
7. **Which of the following is typically a key disadvantage of the public cloud?**
   a) High cost of implementation
   b) Limited scalability
   c) Less control over data and infrastructure
   d) High level of customization
   Answer: c
8. **In which deployment model is the cloud environment owned, managed, and operated by a third-party provider for the general public?**
   a) Hybrid Cloud
   b) Public Cloud
   c) Private Cloud
   d) Multi-cloud
   Answer: b
9. **Which of the following benefits is unique to private clouds?**

   a) Faster data retrieval
   b) Complete control over the cloud infrastructure
   c) Lower operational costs
   d) Shared resources with multiple tenants
   Answer: b

Virtualization

10. **What is the main purpose of virtualization in computing?**
    a) To run multiple operating systems on the same hardware
    b) To allow only one application per system
    c) To reduce memory usage
    d) To increase physical storage
    Answer: a
11. **Which software is responsible for managing virtual machines?**
    a) Hypervisor
    b) Database server
    c) File system
    d) Operating system
    Answer: a

12. **Which of the following is NOT a type of virtualization?**
    a) Hardware virtualization
    b) Software virtualization
    c) Network virtualization
    d) Physical virtualization
    Answer: d
13. **What is the key difference between Type 1 and Type 2 hypervisors?**
    a) Type 1 runs directly on hardware, while Type 2 runs on an operating system
    b) Type 1 is used for cloud applications
    c) Type 2 runs directly on hardware, while Type 1 runs on an operating system
    d) Type 2 is more secure than Type 1
    Answer: a
14. **Which of the following is an example of virtualization software?**
    a) Microsoft Windows Server
    b) VMware
    c) Docker
    d) Apache HTTP Server
    Answer: b
15. **In virtualization, what is the term for creating isolated virtual instances of resources?**
    a) Over-provisioning
    b) Resource pooling
    c) Load balancing
    d) High availability
    Answer: b
16. **What does hardware virtualization allow?**
    a) Multiple operating systems to share the same physical machine
    b) Only a single operating system to run
    c) Independent execution of physical and virtual machines
    d) Faster execution of virtual machines
    Answer: a
17. **Which of the following is a benefit of virtualization in cloud computing?**
    a) Higher hardware costs
    b) More effective resource utilization
    c) Less scalability
    d) Increased hardware usage
    Answer: b
18. **Which of the following best describes containerization?**
    a) Creating multiple virtual machines on a single host
    b) Running multiple containers on a virtual machine
    c) Running containers independently of virtual machines
    d) Allowing multiple users to share a single operating system
    Answer: b

Distributed Parallel vs Cloud Computing

19. **What is the primary difference between distributed computing and cloud computing?**
    a) Distributed computing is always based on the internet
    b) Cloud computing always involves public resources
    c) Distributed computing involves multiple independent computers, while cloud computing involves renting resources
    d) Cloud computing is not scalable
    Answer: c
20. **Which of the following is a key feature of distributed parallel computing?**
    a) All tasks are processed on a single server
    b) Tasks are divided and processed in parallel on multiple computers
    c) All tasks are executed sequentially

d) It uses a single storage system for all computations

Answer: b

21. **Which of the following is true about cloud computing?**
    a) It requires local hardware only
    b) It provides scalable resources over the internet
    c) It cannot support parallel processing
    d) It is only suitable for small-scale applications
    Answer: b
22. **What is an example of parallel computing in the context of cloud computing?**
    a) Running tasks sequentially on a single server
    b) Running multiple tasks simultaneously across multiple nodes
    c) Using only on-premise infrastructure
    d) Storing data on a cloud storage service
    Answer: b
23. **Which of the following technologies is closely associated with distributed computing?**
    a) Virtualization
    b) Cloud storage
    c) Grid computing
    d) Containerization
    Answer: c
24. **Which of the following is NOT a characteristic of parallel computing?**
    a) Divides tasks into smaller sub-tasks
    b) Executes tasks simultaneously
    c) Requires high-speed internet
    d) Tasks run sequentially
    Answer: d
25. **What is the main advantage of distributed computing?**
    a) It only uses a single machine
    b) It offers unlimited scalability and reliability
    c) It does not require any networking components
    d) It is not suitable for cloud-based services
    Answer: b

Containerization

26. **Which of the following is a containerization tool commonly used in cloud environments?**
    a) Docker
    b) VMware
    c) OpenStack
    d) Hyper-V
    Answer: a
27. **What is a primary benefit of using containers in cloud computing?**
    a) Containers are less secure than virtual machines
    b) Containers consume more resources than virtual machines
    c) Containers are lightweight and can be deployed faster
    d) Containers require dedicated hardware
    Answer: c
28. **Which of the following is the main purpose of a container in cloud computing?**
    a) Isolate applications and services to run consistently across different environments
    b) Provide virtual machines with more resources
    c) Host databases only
    d) Store data in a distributed manner
    Answer: a
29. **What is Docker primarily used for?**
    a) Hosting virtual machines
    b) Creating and managing containers
    c) Running distributed databases

d) Virtualizing hardware resources

Answer: b

30. **What is the difference between containers and virtual machines?**
    a) Containers use fewer system resources compared to virtual machines
    b) Virtual machines are more efficient than containers
    c) Containers are less secure than virtual machines
    d) Containers require a hypervisor
    Answer: a
31. **Which of the following does NOT describe a feature of containers?**
    a) Portability across different environments
    b) Isolation of applications
    c) Dependency management
    d) Full virtualization of hardware
    Answer: d
32. **Which of the following tools is commonly used for orchestrating containers in large-scale cloud environments?**
    a) Docker
    b) Kubernetes
    c) OpenStack
    d) Vagrant
    Answer: b
33. **Which of the following is a disadvantage of using containers?**
    a) High resource usage
    b) Requires specialized hardware
    c) Complexity in managing stateful applications
    d) Lack of scalability
    Answer: c
34. **What is Kubernetes primarily used for in container management?**
    a) Automating application deployment and scaling
    b) Managing virtual machines
    c) Providing network security
    d) Creating new containers
    Answer: a
35. **Which cloud service model typically utilizes containers to run applications?**
    a) Software as a Service (SaaS)
    b) Platform as a Service (PaaS)
    c) Infrastructure as a Service (IaaS)
    d) Network as a Service (NaaS)
    Answer: b
36. **Which of the following is an advantage of containerization over virtualization?**
    a) Containers offer greater isolation
    b) Containers are faster to start and stop compared to virtual machines
    c) Containers require more system resources than virtual machines
    d) Containers cannot run multiple services
    Answer: b
37. **What is a container image in the context of Docker?**
    a) A physical server used to host containers
    b) A compressed file containing everything needed to run a containerized application
    c) A virtual machine running in the cloud
    d) A runtime environment for applications
    Answer: b
38. **Which of the following is NOT a key feature of Docker containers?**
    a) Application portability
    b) Isolation of applications
    c) Lightweight and fast execution

d) Complete hardware emulation

Answer: d

39. **Which of the following is typically managed using a container orchestration tool like Kubernetes?**

a) Managing container images

b) Running a hypervisor

c) Deploying, scaling, and managing multiple containers

d) Virtualizing hardware resources

Answer: c

40. **What is the advantage of using containers for microservices-based architectures?**

a) Containers can scale independently and manage microservices efficiently

b) Containers cannot be used for microservices

c) Containers are limited to a single microservice

d) Containers are not secure for microservices

Answer: a

1. Types of Virtualization

1. Which of the following is the main purpose of virtualization?

a) To increase physical hardware usage

b) To run multiple operating systems on a single machine

c) To create multiple physical servers

d) To reduce the number of applications needed

Answer: b

2. In which virtualization technique does the host system run a hypervisor directly on hardware without any underlying operating system?

a) Type 1 Virtualization

b) Type 2 Virtualization

c) Para Virtualization

d) Server Virtualization

Answer: a

3. Which of the following is an example of a Type 1 hypervisor?

a) VMware Workstation

b) VirtualBox

c) Hyper-V

d) VMware Fusion

Answer: c

4. Which virtualization type allows the virtual machine to directly access the physical hardware through the hypervisor?

a) Full Virtualization

b) Para Virtualization

c) Hardware Virtualization

d) Cloud Virtualization

Answer: a

5. Which of the following best describes server virtualization?

a) Running multiple applications on a single server

b) Dividing a physical server into multiple virtual servers

c) Running virtual machines on separate physical machines

d) Running multiple operating systems without physical separation

Answer: b

6. In which type of virtualization does the guest operating system require modifications to work with the hypervisor?

a) Full Virtualization

b) Para Virtualization

c) Hardware Virtualization

d) Type 2 Virtualization

Answer: b

7. Which of the following allows the guest OS to communicate directly with the hypervisor in para virtualization?

a) VirtualBox

b) Xen

c) VMware ESXi

d) Microsoft Hyper-V

Answer: b

2. Server-based vs Hypervisor-based Virtualization

8. What is the primary difference between server-based virtualization and hypervisor-based virtualization?

a) Server-based virtualization requires a hypervisor, while hypervisor-based virtualization does not

b) Server-based virtualization involves running multiple operating systems on a single server, while hypervisor-based virtualization uses a hypervisor to manage virtual machines

c) Hypervisor-based virtualization only works on cloud platforms, whereas server-based works on-premises

d) There is no difference between them

Answer: b

9. Which of the following is an example of server-based virtualization?

a) VMware ESXi

b) XenServer

c) Microsoft Hyper-V

d) Docker

Answer: c

10. In server-based virtualization, the physical server is often partitioned into multiple virtual servers. This is also known as:

a) Full virtualization

b) Para virtualization

c) Virtual machine monitor (VMM)

d) Virtualization manager

Answer: c

3. Type 1 vs Type 2 Virtualization

11. Which of the following best describes Type 1 virtualization?

a) It runs on top of an existing operating system

b) It is also known as host-based virtualization

c) The hypervisor runs directly on hardware

d) It is typically slower than Type 2

Answer: c

12. Which of the following is a key characteristic of Type 2 virtualization?

a) Runs directly on the hardware

b) Requires no underlying operating system

c) Runs on top of an existing operating system

d) Typically used in enterprise data centers

Answer: c

13. Which of the following is NOT a Type 1 hypervisor?

a) VMware vSphere

b) Microsoft Hyper-V

c) Oracle VM VirtualBox

d) Xen

Answer: c

14. Which of the following is an example of Type 2 virtualization software?

a) Xen

b) VMware ESXi

c) VirtualBox

d) Hyper-V

Answer: c

15. Which of the following is true regarding Type 1 hypervisors?

a) They offer better performance compared to Type 2

b) They require an underlying operating system

c) They are only used for desktop virtualization

d) They have a higher overhead than Type 2 hypervisors

Answer: a

16. Type 2 hypervisors typically offer:

a) Faster boot times and better performance

b) Lower performance due to reliance on host OS

c) Access to hardware directly

d) Higher isolation from the host system

Answer: b

4. Full vs Para Virtualization

17. Full virtualization allows the guest operating system to run without modification. What is a key benefit of this approach?

a) It requires the guest OS to be specially modified for virtualization

b) It can run unmodified OS on a virtualized environment

c) It reduces the security of virtual machines

d) It allows multiple guest OSes to be installed on a physical host

Answer: b

18. Which of the following best describes para virtualization?

a) It allows virtual machines to run completely independently without any host interaction

b) The guest OS is modified to work with the hypervisor for better performance

c) It involves full access to hardware by the guest OS

d) It does not require a hypervisor to manage the virtual machines

Answer: b

19. Which of the following is a key advantage of full virtualization over para virtualization?

a) Better performance

b) Requires less overhead

c) No need to modify the guest OS

d) More secure

Answer: c

20. What is a disadvantage of para virtualization?

a) Requires modification of the guest operating system

b) It cannot run multiple OS at once

c) It is more complex and requires more resources

d) It provides less isolation between VMs

Answer: a

21. Which of the following hypervisors supports full virtualization?

a) VMware Workstation

b) KVM

c) Hyper-V

d) XenServer

Answer: b

22. What is a major disadvantage of full virtualization?

a) It requires modification of the guest OS

b) It often leads to higher performance overhead

c) It lacks resource sharing

d) It is more secure than para virtualization

Answer: b

23. Which of the following is an example of full virtualization?

a) VMware ESXi

b) Xen with para virtualization enabled

c) Docker containers

d) Xen in para virtualization mode

Answer: a

24. What kind of virtualization does Xen support?

a) Full virtualization

b) Para virtualization

c) Both full and para virtualization

d) None

Answer: c

25. The guest OS in para virtualization has to be modified to work efficiently with the hypervisor. What does this imply for performance?

a) The guest OS has lower performance

b) The guest OS runs slower in para virtualization

c) The guest OS can be more efficient than in full virtualization

d) Performance does not change in para virtualization

Answer: c

26. Which of the following is a characteristic of Type 2 hypervisors when compared to Type 1 hypervisors?

a) They run directly on physical hardware

b) They require a host operating system to function

c) They are typically used in data centers

d) They have no performance overhead

Answer: b

27. What is the primary advantage of using Type 1 hypervisor over Type 2 in enterprise environments?

a) Type 1 hypervisors require less memory

b) Type 1 hypervisors are more secure and efficient as they run directly on the hardware

c) Type 2 hypervisors are faster to set up and use

d) Type 1 hypervisors support more guest OS types

Answer: b

28. When using para virtualization, which of the following must be modified in the guest OS?

a) The system's boot process
b) The hypervisor itself
c) The guest OS kernel to communicate directly with the hypervisor
d) The hardware configuration of the guest OS
Answer: c

29. Which of the following statements is true about full virtualization in comparison to para virtualization?

a) Full virtualization allows the guest OS to access the physical hardware directly
b) Full virtualization does not require the guest OS to be modified
c) Full virtualization is more efficient than para virtualization in all cases
d) Full virtualization only works with open-source operating systems
Answer: b

30. Which of the following hypervisors can run both full virtualization and para virtualization?

a) VMware ESXi
b) Microsoft Hyper-V
c) Xen hypervisor
d) KVM
Answer: c

31. In a para virtualization environment, which of the following is necessary for the guest OS to run effectively?

a) A separate kernel for each guest OS
b) The guest OS must be explicitly modified to use hypervisor APIs
c) The guest OS kernel must be the same as the host's
d) No modification is required for para virtualization to work
Answer: b

32. In Type 1 hypervisor architecture, how does the guest operating system interact with the hardware?

a) Directly through hardware virtualization
b) Via an intermediary guest OS
c) Through a hypervisor that manages hardware resource allocation
d) Through a network interface
Answer: c

33. Which of the following describes the performance overhead of para virtualization?

a) It has higher performance overhead than full virtualization because of the need for guest OS modification
b) It has no performance overhead
c) It has a lower performance overhead than full virtualization because the guest OS is aware of the hypervisor
d) It has significantly more overhead due to full emulation of hardware
Answer: c

34. Which of the following hypervisors provides a complete virtual machine monitor and emulates hardware for guest OS?

a) Type 1 hypervisor
b) Type 2 hypervisor
c) Para virtualization
d) Both Type 1 and Type 2
Answer: a

35. What is the main disadvantage of Type 2 hypervisor?

a) It does not support multiple operating systems
b) It requires significant CPU resources
c) It relies on a host operating system, which introduces overhead and reduces performance
d) It can only run Linux-based guest OSes
Answer: c

36. In which virtualization architecture does the hypervisor directly control the hardware resources, without the need for an OS as an intermediary?

a) Type 1 hypervisor
b) Type 2 hypervisor
c) Server-based virtualization
d) Para virtualization
Answer: a

37. In a system using Type 2 hypervisors, what is the role of the host OS?

a) The host OS controls the allocation of resources to the virtual machines
b) The host OS provides virtualized hardware for guest operating systems
c) The host OS acts as a hypervisor
d) The host OS is not required in Type 2 hypervisors
Answer: a

38. Which of the following virtualization techniques is most suitable for running multiple operating systems on a personal laptop with minimal performance impact?

a) Type 1 hypervisor
b) Type 2 hypervisor
c) Para virtualization
d) Full virtualization
Answer: b

39. Which of the following is a benefit of using para virtualization in cloud environments?

a) Full hardware virtualization is unnecessary, reducing the resource overhead
b) The guest OS is unaware of the hypervisor
c) The guest OS can be run without modification
d) It is less efficient than full virtualization but more secure
Answer: a

40. Which of the following is the correct distinction between Type 1 and Type 2 hypervisor in terms of their installation?

a) Type 1 hypervisors are installed on top of the host OS, while Type 2 hypervisors run directly on hardware
b) Type 1 hypervisors run directly on hardware, while Type 2 hypervisors are installed on top of the host OS
c) Type 2 hypervisors are used in data centers, while Type 1 hypervisors are for personal computers

d) Type 1 hypervisors are open-source, while Type 2 are commercial products
Answer: b

41. Which of the following best explains the concept of "hardware virtualization" used in full virtualization?

a) The virtual machine operates without any interaction with the hypervisor
b) The guest OS is fully aware of the hypervisor and communicates directly with the hardware
c) The hypervisor simulates physical hardware to allow guest OSes to run as though they are on real hardware
d) The guest OS kernel needs to be modified to work with the hypervisor
Answer: c

Virtual Machines vs Containers

1. Which of the following is the key difference between Virtual Machines (VMs) and Containers?

a) VMs virtualize the hardware, while containers virtualize the operating system
b) Containers run only on Linux systems, while VMs can run on any operating system
c) Containers are slower to deploy than VMs
d) VMs provide better isolation than containers
Answer: a

2. What is the primary overhead for Virtual Machines compared to containers?

a) Containers require more memory than VMs
b) VMs require more system resources because they run a full operating system
c) Containers are more secure than VMs
d) VMs cannot scale as well as containers
Answer: b

3. Which of the following best describes a container?

a) A fully isolated virtual machine running an entire operating system
b) A lightweight process that shares the host operating system kernel
c) A storage mechanism for virtual machine images
d) A type of hypervisor used to run virtual machines
Answer: b

4. In which environment is the use of containers most beneficial?

a) Running multiple isolated operating systems
b) Running applications that need to be deployed quickly and consistently across environments
c) Applications requiring complete hardware isolation
d) For running virtualized guest OSes that need separate kernels
Answer: b

5. Which of the following is a feature of containers?

a) Containers require a separate OS for each instance
b) Containers are slower to start compared to VMs
c) Containers provide less isolation compared to VMs but are more lightweight
d) Containers use hypervisors for resource allocation
Answer: c

6. Which is true about Virtual Machines?

a) They use the host operating system kernel
b) Each VM runs a full OS and has its own kernel
c) VMs are faster to deploy than containers
d) VMs are limited to a single operating system type
Answer: b

7. Which of the following technologies allows for easier scaling and faster application deployment?
a) Virtual Machines
b) Containers
c) Bare metal servers
d) Hypervisors
Answer: b

8. What is a major disadvantage of using Virtual Machines over Containers?
a) VMs are more lightweight and faster to start
b) VMs are better suited for scaling applications
c) VMs require more system resources, including full operating system instances
d) VMs do not provide isolation between applications
Answer: c

9. Which of the following containerization platforms provides isolation and virtualization for containers?
a) Docker
b) VMware
c) Kubernetes
d) Apache Mesos
Answer: a

10. Which of the following statements is true for Virtual Machines (VMs)?
a) VMs share the host OS kernel
b) VMs can run multiple OSes on a single physical server
c) VMs have less overhead than containers
d) VMs are inherently more scalable than containers
Answer: b

11. Which of the following container orchestration tools is used to manage containerized applications across clusters of machines?
a) Docker Compose
b) Kubernetes
c) Apache Kafka
d) Docker Swarm
Answer: b

12. A virtual machine typically requires:
a) A single application running on a single server
b) A full operating system instance to be virtualized
c) A separate hardware device for each virtualized application
d) No isolation between applications
Answer: b

13. Containers run on top of which type of operating system architecture?
a) Hardware virtualization
b) Hypervisor-based OS
c) OS-level virtualization
d) Virtualized guest operating system
Answer: c

14. Which of the following is a key benefit of using containers over Virtual Machines in a microservices architecture?
a) Containers offer stronger isolation between services

b) Containers are more resource-efficient and quicker to start than VMs
c) Containers are able to run on multiple operating systems
d) Containers offer more flexibility in scaling up
Answer: b

15. What technology is used to build and run containers in cloud environments?
a) Docker
b) VirtualBox
c) VMware vSphere
d) Hyper-V
Answer: a

Continuous Integration and Continuous Delivery (CI/CD)

16. What is the main goal of Continuous Integration (CI)?
a) To automate the testing of software
b) To merge all developers' code into a shared repository frequently
c) To deploy applications to production frequently
d) To track changes in source code efficiently
Answer: b

17. Which of the following tools is commonly used for Continuous Integration (CI)?
a) Jenkins
b) Kubernetes
c) Docker Swarm
d) Nagios
Answer: a

18. What does Continuous Delivery (CD) focus on?
a) Continuously monitoring the production environment
b) Automatically deploying code changes to a production-like environment for further testing
c) Continuous integration of code without deployment
d) Merging code changes into a version control system
Answer: b

19. What is the main advantage of using Continuous Delivery (CD) in a development workflow?
a) Faster compilation time
b) Ensures that the code is always in a deployable state
c) Reduces the need for automated testing
d) Requires fewer developers to manage code deployment
Answer: b

20. In a CI/CD pipeline, which stage comes after Continuous Integration?
a) Testing
b) Continuous Deployment
c) Continuous Monitoring
d) Continuous Delivery
Answer: d

21. What is the purpose of automated tests in the CI/CD pipeline?
a) To eliminate the need for manual testing
b) To detect bugs and regressions in the code base early
c) To reduce the time spent on code reviews
d) To speed up deployment to production
Answer: b

22. Which of the following tools is used for Continuous Deployment (CD)?

a) Jenkins
b) Docker
c) Kubernetes
d) Ansible
Answer: a

23. Which of the following is a benefit of using Continuous Integration (CI) in a project?

a) Minimizes integration problems by frequently merging code
b) Increases deployment time by deploying multiple changes at once
c) Reduces the time for application monitoring
d) Ensures that every change is manually tested
Answer: a

24. Which of the following is the main goal of Continuous Integration (CI) in Agile Development?

a) To deploy code only after final testing
b) To automatically merge all code into the main branch on a weekly basis
c) To ensure that code changes are tested and integrated continuously into the project
d) To prevent new features from being released until completion
Answer: c

25. Which of the following is NOT a step in a typical CI/CD pipeline?

a) Code Commit
b) Build
c) Manual Testing
d) Deployment to Production
Answer: c

26. What is the role of a version control system in CI/CD?

a) To deploy code changes to production environments
b) To monitor the performance of production applications
c) To manage and track changes to the source code
d) To maintain an inventory of container images
Answer: c

27. What is one of the key differences between Continuous Delivery and Continuous Deployment?

a) Continuous Delivery automatically deploys code to production, while Continuous Deployment requires manual intervention
b) Continuous Delivery does not require automated testing, while Continuous Deployment does
c) Continuous Delivery stops at staging environments, whereas Continuous Deployment pushes to production
d) Continuous Delivery is used for microservices, while Continuous Deployment is used for monolithic applications
Answer: c

28. What type of testing is typically included in a CI/CD pipeline?

a) Regression Testing
b) Unit Testing
c) Integration Testing
d) All of the above
Answer: d

29. What is the purpose of a staging environment in Continuous Delivery (CD)?

a) To store application logs before they are pushed to production

b) To simulate a production environment where new code changes can be tested before deployment
c) To store temporary application files
d) To handle user authentication and access control
Answer: b

30. Which of the following is a feature of Continuous Delivery (CD)?
a) Frequent release of software to the production environment
b) Automatic rollback if an issue occurs after deployment
c) A single large deployment after several months of development
d) The need for manual testing after each code merge
Answer: b

31. Which of the following is true regarding a typical CI/CD pipeline?
a) It can only be used for web applications
b) It includes steps for building, testing, and deploying code automatically
c) It involves manual checks before each deployment
d) It skips automated testing to speed up the process
Answer: b

32. Which of the following is a common tool for managing CI/CD pipelines?
a) Jenkins
b) GitHub
c) Docker
d) Kubernetes
Answer: a

33. What does a successful Continuous Integration (CI) process result in?
a) Code changes being deployed to production automatically
b) Faster integration of code into the main codebase with fewer errors
c) More manual testing of new features
d) Fewer code commits to the main branch
Answer: b

34. Which of the following does Continuous Integration (CI) ensure for a development team?
a) Only developers commit code to the version control system
b) Code is always in a deployable state after integration
c) Code is only tested once at the end of the project
d) Developers cannot merge incomplete features
Answer: b

35. Which of the following is the role of Docker in the CI/CD pipeline?
a) Docker automatically tests code changes in the pipeline
b) Docker provides the platform for containerized applications during development and deployment
c) Docker manages the version control system in the CI/CD pipeline
d) Docker is used to monitor system performance in production environments
Answer: b

36. What is the first step in a typical CI/CD pipeline?
a) Build
b) Code Commit
c) Automated Testing
d) Deployment
Answer: b

37. What is one of the main reasons to implement CI/CD pipelines in modern software development?

a) To increase the amount of manual testing
b) To ensure faster and more reliable code deployment
c) To reduce the number of tools used in the software development process
d) To allow software releases only after lengthy testing periods
Answer: b

38. Which CI/CD concept ensures that the software is always in a deployable state?

a) Continuous Testing
b) Continuous Deployment
c) Continuous Monitoring
d) Continuous Integration
Answer: b

39. Which of the following is a primary advantage of using CI/CD pipelines in agile teams?

a) Manual integration of new features
b) Increased time spent on manual deployment
c) Faster release of small, incremental changes to production
d) Decreased need for communication between developers and operations teams
Answer: c

40. What is the role of "Build Automation" in the CI/CD pipeline?

a) To manually test each component before deployment
b) To automatically compile and package the application each time code is committed
c) To handle the manual deployment process
d) To monitor production systems in real-time
Answer: b