1. What tool should you use to build a web app that works across all platforms?

a) Angular

<mark>b) React</mark>

c) Express

d) Vue

Rationale: React is a JavaScript library often used to build web applications across multiple platforms.

2. What is the primary purpose of RAID?

a) Performance improvement

b) Security

<mark>c) Reliability</mark>

d) Cost reduction

Rationale: RAID (Redundant Array of Independent Disks) is primarily designed to improve reliability and fault tolerance in computer systems by storing data redundantly across multiple drives. This redundancy ensures that data is not lost even if one or more drives fail, depending on the RAID level used.

3. **Which of these communication channels carries signals simultaneously?**

a) Half-Duplex

<mark>b) Full-Duplex</mark>

c) Simplex

d) Multi-Duplex

Rationale: Full-Duplex: Signals can travel simultaneously in both directions

4. **What programming language does Apple iOS use?**

a) Python

b) Java

c) C+

<mark>d) Swift</mark>

Rationale: Apple iOS primarily uses Swift, a programming language developed by Apple. Swift is designed to work seamlessly with iOS, macOS, watchOS, and tvOS, providing an intuitive and efficient way to create apps for Apple's platforms.

5. **What programming language does Android OS use?**

a) Python
b) C+
c) Swift
d) Java

Rationale: Android OS primarily uses Java as its core programming language for app development. Java provides the foundation for Android's APIs and is widely supported in Android Studio, the official development environment for Android.

6. What benefits do you get from using a CLI?
a) Easier navigation for beginners
b) Faster and more direct control over the system *
c) Reduced need for memorization
d) Graphical interface accessibility

Rationale: Command-line interfaces (CLI) allow for faster and more precise control over the system compared to graphical interfaces.

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7. Which motherboard supports a full-size expansion slot?
a) Mini-ITX
b) ATX
c) Micro-ITX
d) Nano-ITX

Rationale: The ATX motherboard supports full-size expansion slots, unlike smaller motherboard formats.

8. Which motherboard has a GPU mounted at a right angle next to the expansion slot?
a) Mini-ITX
b) ATX
c) Nano-ATX
d) Micro-ATX

Rationale: The **Mini-ITX** motherboard form factor is the one that commonly features a GPU mounted at a right angle next to the expansion slot.

9. Which motherboard has components right-angled for better cooling?

a) Mini-ITX
b) ATX
c) Micro-ATX
d) Riser card-based motherboard

Rationale: A riser card-based motherboard is designed with right-angled components to enhance cooling and airflow.

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10. Which memory is etched onto a silicon chip?

a) RAM
b) ROM
c) Cache
d) DRAM

Rationale: Read-Only Memory (ROM) is permanently etched onto a silicon chip during manufacturing.

11. Which type of drive should you choose for a laptop if you want to be energy efficient?

a) SSD
b) HDD
c) SSHD
d) HHD

Rationale: An SSD (Solid State Drive) is the most energy-efficient option for a laptop. Unlike HDDs (Hard Disk Drives) and SSHDs (Solid State Hybrid Drives), SSDs have no moving parts, which reduces power consumption and heat generation

12. What is the most affordable way to store 16TB of data?

a) SSD
b) HDD
c) Cloud storage
d) NAS

Rationale: Hard disk drives (HDDs) are the most cost-effective storage option for large data capacities like 16TB.

13. Which type of memory module is used in laptops and other small devices?

<mark>a) SODIMM</mark>
b) DIMM
c) SIMM
d) RIMM

Rationale: SODIMM (Small Outline Dual Inline Memory Module) is used in laptops and other small devices due to its compact size.

14. Which of the following is an example of an interpreted language?

a) SQL
b) Kafka
c) HTML
<mark>d) Python</mark>

Rationale: Python is an interpreted language, meaning its code is executed line-by-line by an interpreter at runtime, rather than being compiled into machine code beforehand.

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15. Which authentication method provides multiple different answers?
a) Someone you know
<mark>b) Something you know</mark>
c) IP address
d) Something you have

Rationale: "Something you know" authentication could vary, such as a password or a PIN.

16. A group of people wants to format the user interface of a website. Which tool should they use?
<mark>a) CSS</mark>
b) PHP
c) SQL
d) Python

Rationale: CSS is specifically designed for formatting and styling website user interfaces.

17. Which of the following is a runtime environment for executing JavaScript code outside a browser?

a) Express
b) Angular
c) React
d) Node.js

Rationale: Node.js is a runtime environment that allows you to execute JavaScript code outside a browser. It is built on Chrome's V8 JavaScript engine and is commonly used for server-side development.

18. What retains data without power?

a) Non-volatile memory
b) Network Virtual Management
c) Node Version Manager
d) Near-field magnetic storage

Rationale: Non-volatile memory retains data even when powered off.

19. Which of the following is a characteristic of RAID 10?

a) RAID 10 requires parity calculations to ensure redundancy.
b) RAID 10 provides high read and write performance by striping data across mirrored pairs of drives.
c) RAID 10 maximizes storage capacity by eliminating redundancy.
d) RAID 10 can function with just two drives.

Rationale:
RAID 10 combines the redundancy of RAID 1 (mirroring) with the performance of RAID 0 (striping). Data is mirrored across pairs of drives for fault tolerance and then striped across those pairs to achieve high-speed performance

20. iPads need to be connected in a warehouse. Which one should they use?
a) Twisted cable
b) Coax cable

c) Firewire
d) WiFi

Rationale: WiFi is the most suitable wireless solution for connecting devices like iPads in a warehouse.

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21. We need a way to download 10GB per second. Which cable should we use?
a) Firewire
b) Ethernet
c) Fiber optic cable
d) Coaxial cable

Rationale: Fiber optic cables provide high-speed data transfer capabilities up to 10GB per second or more.

22. Which of the following would be used to interconnect 6 computers with speeds of 10GB?

a) Twisted Pair
b) Wi-Fi
c) Fiber Optic
d) Bluetooth

Rationale: For interconnecting 6 computers with speeds of 10GB, Twisted Pair cables, specifically Cat 6a or Cat 7 cables, are the best option

23. What protection does UTM provide?
a) Endpoint protection
b) Antimalware
c) Multipoint protection
d) Firewall

Rationale: Unified Threat Management (UTM) provides multipoint protection through various security features combined into a single solution.

24. What does a container run above?
a) Network
b) Hypervisor
c) Hardware
d) Host OS

Rationale: Containers run above the host system, sharing its kernel and resources.

25. What has a single firewall and provides protection?
a) VPN
b) VLAN
c) UTM
d) Proxy

Rationale: A VPN (Virtual Private Network) provides a secure, encrypted connection through a single firewall.

26. Which cloud computing model suits a company needing IT help desks and other services?
a) SaaS
b) DaaS
c) IaaS
d) PaaS

Rationale: Software as a Service (SaaS) is ideal for providing business-related services like IT help desks.

27. What is the ability to add multiple servers to scale called?
a) Vertical scaling
b) Rapid elasticity
c) Horizontal scaling
d) Load balancing

Rationale: Horizontal scaling involves adding multiple servers to handle increased demand.

28. What allows the software to execute commands?

a) Program application

b) Operating system

c) Database

d) Compiler

Rationale: The operating system acts as the intermediary that executes commands from software.

29. What are two common tasks that both Windows and Linux operating systems allow users to perform?

a) Modify hardware settings / Manage network connections

b) Create and delete files / Create and terminate a program

c) Access cloud storage / Configure printers

d) Edit photos / Write emails

Rationale:

Windows and Linux operating systems allow users to manage files (e.g., creating and deleting files) and control programs (e.g., starting and terminating them), which are essential tasks for any operating system.

30. Which language is best suited for backend web interactions?

a) Python

b) CSS

c) HTML

d) Vue

Rationale: Python is a backend language, whereas CSS and HTML are frontend technologies, and Vue is a frontend JavaScript framework.

31. What environment is designed specifically to run legacy software?

a) Virtual sandbox

b) Application testing

c) Cloud environment

d) Hypervisor

Rationale: A virtual sandbox is an isolated environment specifically designed to test and run software, including legacy applications, without affecting the main system. It ensures compatibility and security for outdated software.

32. What stores data that will be used by the MAR?

a) MDR
b) RAM
c) SSD
d) Cache

Rationale: The Memory Data Register (MDR) is responsible for temporarily holding the data that will be used or processed by the MAR (Memory Address Register), acting as a bridge between the CPU and memory.

33. What allows a virtual machine (VM) to let multiple users share an operating system?

a) Containerization
b) Hypervisor
c) Virtual networking
d) Shared disk partition

Rationale: A hypervisor is a software layer that enables multiple virtual machines (VMs) to efficiently share a single operating system or hardware resources. This allows multiple users to operate their VMs simultaneously on the same host.

34. What is a program application?

a) A software designed to perform a specific task or function for users
b) A physical machine running on an operating system
c) A framework for database management
d) An operating system for managing hardware resources

Rationale: A program application is software designed to help users perform specific tasks, such as word processing, browsing, or managing files. Examples include Microsoft Word, Google Chrome, and Excel.

35. What is the primary difference between a sandbox and a test environment?

a) A sandbox is used for testing legacy software, while a test environment is used for deploying final versions.

b) A sandbox is isolated and safe for testing changes without affecting other systems, while a test environment simulates the real-world production environment.

c) A sandbox is a physical machine, while a test environment is a virtualized system.

d) A sandbox requires a hypervisor, while a test environment requires a cloud platform.

Rationale: A sandbox provides an isolated environment to safely test code or software without risking the actual production or development systems. A test environment, on the other hand, is designed to closely replicate the production environment to ensure the software works as intended in real-world conditions.

36. What is Hadoop primarily used for?

a) Managing relational databases

b) Processing and analyzing large datasets

c) Virtual machine orchestration

d) Cloud storage for small-scale applications

Rationale: Hadoop is an open-source framework specifically designed for the distributed storage and processing of large-scale data across clusters of computers. It is widely used in big data and analytics applications.

37. Which of the following can hold a value in programming?

a) Class

b) Variable

c) Module

d) Function

Rationale: A variable is a storage location in programming that holds a value that can be changed or retrieved during program execution. Classes, modules, and functions are structures that organize or define behaviors but do not directly hold values like variables do.

38. What prevents a hypervisor from being installed?

a) Incompatible CPU architecture

b) Overheating hardware components

c) Not enough memory on the host operating system

d) Incorrect time and date settings

Correct Answer: c) Not enough memory on the host operating system

Rationale: A hypervisor requires sufficient memory on the host operating system

39. Which type of virus does not need a host?

a) Trojan Horse
b) Ransomware
c) Computer Worm
d) Spyware

Rationale: A computer worm is a type of malware that doesn't require a host file to spread. It can replicate itself and spread independently across networks.

40. Which type of malicious software records every keystroke made on a computer to capture sensitive information, such as passwords and credit card details?

a) Spyware
b) Keylogger
c) Trojan Horse
d) Macro Virus

Rationale: A keylogger is a type of spyware specifically designed to monitor and record keystrokes to steal sensitive data. While spyware broadly monitors user activities, keyloggers focus specifically on capturing keyboard inputs.

41. What type of virus attaches itself to the master boot record of a hard drive, making it difficult to detect and remove?

a) File Infector Virus
b) Boot Sector Virus
c) Rootkit
d) Worm

Rationale: Boot Sector Viruses infect the master boot record of a system, which is executed every time the computer starts. This makes them particularly dangerous and difficult to remove, often requiring specialized tools or reformatting the hard drive.

42. Which type of malware encrypts a victim's files and demands payment for the decryption key?

a) Ransomware
b) Trojan Horse
c) Worm
d) Macro Virus

Rationale: Ransomware encrypts the victim's files and holds them hostage until a ransom is paid. It often spreads through malicious email attachments or compromised websites and is designed to block access to critical data until the attacker's demands are met.

43. Which type of malware disguises itself as legitimate software but performs malicious actions when executed?

a) Worm
b) Trojan Horse
c) Rootkit
d) Spyware

Rationale: A Trojan Horse appears to be legitimate software but contains hidden malicious code. Once executed, it can create backdoors, steal data, or harm the system in other ways, often relying on user interaction to activate.

44. Which type of malware is designed to conceal its presence on a system, often granting unauthorized access to attackers?

a) Rootkit
b) Worm
c) File Infector Virus
d) Macro Virus

Rationale: Rootkits are designed to hide their existence by modifying the operating system. This makes them difficult to detect and remove, while granting attackers administrative-level control over the infected system.

45.   A company wants to connect a remote computer to their corporate office on the other side of the country; what would they use to connect them?

a) VPN
b) Router
c) NAS
d) Switch

Rationale: VPN, as it allows secure remote connections to a corporate network.

46. Which operating system gives end users the ability to access information and run applications locally while managing hardware?

a) Server Operating System
b) Workstation Operating System
c) Network Operating System
d) Cloud-Based Operating System

Rationale: A workstation operating system is designed for personal computing, enabling users to access data and run applications locally while managing system hardware efficiently.

47. What is the operating system life cycle stage in which critical security updates will be supported?

a) Mainstream Support
b) Release Candidate
c) Beta
d) Extended Support

Rationale: The extended support phase ensures that critical security updates are provided even after mainstream support ends, protecting the system from vulnerabilities.

48. What is an example of a graphical user interface shell that is provided in Linux operating systems?

a) Bash
b) Gnome
c) Zsh
d) Csh

Rationale: Gnome is a popular desktop environment for Linux that provides a graphical user interface (GUI), making it easier for users to interact with the operating system.

49. What is an example of a system call used by the Windows API?

a) CreateProcess()
b) Read()
c) Mq_open()
d) mq_close

Rationale: CreateProcess() is a system call in the Windows API used to create and manage processes, allowing new applications to run in the system.

50. What is a category of a system service that provides compilers, debuggers, and interpreters for common programming languages?

a) Background Services
b) Programming-Language Support
c) File Management
d) Status Information

Rationale: This category includes essential tools such as compilers, debuggers, and interpreters, which are necessary for software development and execution.

51. Which device and OS pair include an operating system that uses SpringBoard as the standard interface?

a) iPad, iOS
b) Desktop Computer, Windows 11
c) Cisco Router, Cisco IOS
d) Server Computer, Windows Server 2022

Rationale: SpringBoard is the graphical user interface and application launcher for Apple's iOS devices, including iPads.

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52. Which problem is addressed by using a RAID structure?

a) Incompatibility
b) Poor Security of the System
c) Poor Reliability of the System
d) Poor Performance of the System

Rationale: RAID (Redundant Array of Independent Disks) enhances data reliability by providing redundancy and fault tolerance, reducing the risk of data loss due to hardware failure.

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53. Which motherboard component is a signal pathway?

a) Bus
b) Expansion Slots
c) Memory Slots and Cache
d) Chipsets

Rationale: The bus is responsible for transmitting data between different components of the motherboard, acting as a communication pathway.

54. Which motherboard component is used for management of high-speed peripheral communication?

a) Expansion Slots
b) Memory Slots and Cache
c) Northbridge
d) Chipsets

Rationale: The Northbridge chipset facilitates communication between the CPU, RAM, and high-speed peripherals, optimizing system performance.

55. What is the control unit register responsible for holding the address of a memory location?

a) Memory Address Register
b) Memory Data Register
c) Instruction Register
d) Program Counter Register

Rationale: The memory address register (MAR) stores the address of the memory location being accessed, allowing the CPU to retrieve or store data.

56. What is responsible for moving data from one place to another?

a) Program Flow Instructions
b) Integer Arithmetic Instructions
c) Floating Point Instructions
d) Data Movement Instructions

Rationale: These instructions are responsible for transferring data within the CPU or between memory and registers.

57. Which requirement would a physical machine need to have replicated by the hypervisor?

a) Speed of Operation
<mark>b) Emulation</mark>
c) Agility
d) Virtual Sandbox

Rationale: A hypervisor needs to emulate physical hardware to create virtual environments that can run different operating systems.

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58. What software and hardware are needed to create a virtual environment called?

<mark>a) Type 1 Hypervisor</mark>
b) Virtual Desktop Environment
c) Type 2 Hypervisor
d) Emulation

Rationale: A Type 1 hypervisor runs directly on the hardware, managing virtual machines without requiring a host operating system.

59. Which device actively interacts with or affects its environment when detecting attacks?

a) Remote Access Service (RAS)
<mark>b) Intrusion Prevention System (IPS)</mark>
c) Intrusion Detection System (IDS)
d) Unified Threat Management (UTM)

Rationale: An IPS actively blocks threats in real-time by analyzing network traffic and preventing malicious activity.

60. Which category of internet and cloud-based services provides software development tools?

<mark>a) Platform as a Service (PaaS)</mark>
b) Infrastructure as a Service (IaaS)
c) Unified Threat Management (UTM)
d) Software as a Service (SaaS)

Rationale: PaaS offers a development environment with tools like frameworks, operating systems, and databases for building applications.

61. What is a debugging tool that allows the stopping of program execution?

a) Syntax Checking
b) Threading
c) Breakpoint
d) Memory Inspector

Rationale: A breakpoint is used in debugging to pause execution at a specific point, allowing developers to inspect variables and program flow.

62. Which term refers to the concept of procedural programming?

a) Class
b) Object
c) Instance Variable
d) Modules

Rationale: Modules in procedural programming help organize code into reusable and manageable sections, improving maintainability.

63. Which scripting or programming tool is based on COM?

a) Windows Batch Scripts
b) Visual Basic Script (VBScript)
c) JavaScript
d) PowerShell

Rationale: VBScript is based on Microsoft's Component Object Model (COM), allowing interaction with system components and applications.

64. Which type of twisted pair cable can transmit data at speeds up to 16 Mbps?

a) Category 1
b) Category 2
c) Category 3
d) Category 4

Rationale: Category 4 cables were designed for telephone and early networking applications, supporting data rates up to 16 Mbps.

65. What defines ground rules used by channel signals and messages within a network?

a) Packets
b) Client-server model
c) Peer-to-peer model
d) Protocol

Rationale: Protocols define communication rules for network devices, ensuring data is transmitted and received correctly.

66. An application is configured to control a resource and allow three other computers to access it. Which network architecture should the application have?

a) Client-to-peer
b) Client-server
c) Server-server
d) Peer-to-peer

Rationale: In a client-server model, a central application provides resources and services to multiple client computers.

67. A software architect is designing a solution that requires an interactive web application. Which technology could the architect choose for a front-end solution?

a) Java
b) CouchDB
c) React
d) Node

Rationale: React is a popular JavaScript library for building dynamic, interactive user interfaces in web applications.

68. An organization has decided to purchase Android devices for all its employees. Which programming language will the development team have to adopt to use the devices?

a) PHP
b) Java
c) Python
d) Swift

Rationale: Java is the primary language for Android development, supported by the Android SDK.

69. An organization has decided to purchase Apple devices for all its employees. Which programming language will the development team have to adopt to use these devices?

a) Java
b) PHP
c) Swift
d) Python

Rationale: Swift is the official language for Apple app development, optimized for iOS and macOS platforms.

70. How is the security of a guest established in client-side virtualization?

a) The guest inherits protection from the host operating system
b) The guest must be independently secured
c) The guest is automatically protected by the hypervisor
d) The guest is paired with a security guest before use

Rationale: In client-side virtualization, the guest OS does not inherit the security of the host, requiring separate security measures.

71. An organization has a number of employees who are familiar with working and configuring Apache servers.

Which tech stack should be recommended for an organization with this skill set?

a) MERN
b) MEVN
c) LAMP
d) MEAN

Rationale: The LAMP stack (Linux, Apache, MySQL, PHP) is widely used for web development and aligns with Apache expertise.

72. Which tool should a network administrator use for network styling rather than just functionality?

a) Tailwind
b) React
c) Angular
d) Vue

Rationale: Tailwind is a utility-first CSS framework designed for styling web applications.

73. What is cloud computing service availability measured in?

a) Terabytes
b) Gigahertz
c) Nines
d) Hosts

Rationale: Service availability is often measured in "nines" (e.g., 99.9% uptime), indicating reliability.

74. Which cloud computing service is an example of Software as a Service (SaaS)?

a) Network firewalls
b) Virtual machine
c) Customer-managed software
d) File sharing

Rationale: SaaS provides cloud-based applications like file-sharing services (Google Drive, Dropbox).

75. Which type of cloud service is web-based email?

a) Network as a Service (NaaS)
b) Data as a Service (DaaS)
c) Infrastructure as a Service (IaaS)
d) Software as a Service (SaaS)

Rationale: Web-based email (e.g., Gmail, Outlook) is a SaaS offering that allows users to access email services via the internet.