

4-MSCSDFMTCSAID - Provisional Answer Key

1. The OSI model consists of _____ separate but related layers.
(A) 5 (B) 7
(C) 3 (D) 4
2. In computer network CRC is used for _____.
(A) Error Correction (B) Data Correction
(C) Bit Transfer (D) Byte Transfer
3. The simultaneous transmission of multiple signals across a single data link is possible with _____.
(A) Encoding (B) Decoding
(C) Multiplexing (D) Demultiplexing
4. _____ are omnidirectional.
(A) Radio Waves (B) Micro Waves
(C) Infrared Waves (D) Light Waves
5. The bandwidth of common channel is divided into bands. This technique is known as _____.
(A) Character Division Multiple Access (B) Time Division Multiple Access
(C) Code Division Multiple Access (D) Frequency Division Multiple Access
6. The _____ is a client/server application that identifies each host on the Internet with a unique user-friendly name.
(A) Domain Name System (B) Hyper Text Transfer Protocol
(C) Internet Protocol (D) Transport Control Protocol
7. _____ is a protocol used for pulling messages from a mail server.
(A) FTP (B) SMTP
(C) TELNET (D) IMAP
8. The uniform resource locator (URL) is a standard for specifying any kind of information on the Internet. Which of the following is not the part of URL?
(A) Protocol (B) Port
(C) Input String (D) Host Computer
9. A proxy firewall filters at the _____.
(A) Transport Layer (B) Application Layer
(C) Session Layer (D) Network Layer
10. The _____ is a control protocol designed to add more functionalities to the audio/video streaming process.
(A) FTP (B) BOOTP
(C) RTSP (D) SMTP
11. Allocate the smallest hole that is big enough. This is _____ allocation.
(A) First fit (B) Best fit
(C) Small fit (D) Worse fit
12. Which of the following is true about paging?
(A) Paging is a non contiguous memory allocation.
(B) Paging is a contiguous memory allocation.
(C) Paging requires different size blocks.
(D) Paging leads to external memory fragmentation.

13. Virtual memory is commonly implemented by _____.
 (A) Runtime Loading (B) Segmentation
 (C) Demand Paging (D) Demand Swapping
14. In a typical processor, a _____ holds the address of the instruction to be fetched next.
 (A) Program counter (B) Memory Address Register
 (C) Memory Buffer Register (D) Instruction Register
15. The Locality of Reference principle is applicable to _____.
 (A) Processor (B) Cache Memory
 (C) Random Access Memory (D) Hard Disk
16. What is the time complexity of accessing an element in an array using its index?
 (A) $O(1)$ (B) $O(n)$
 (C) $O(\log n)$ (D) $O(n \log n)$
17. The time complexity of binary search algorithm is
 (A) $O(n)$ (B) $O(2n)$
 (C) $O(\log n)$ (D) $O(n \log n)$
18. What is the time complexity of inserting a new node at the head of a singly linked list?
 (A) $O(1)$ (B) $O(n)$
 (C) $O(\log n)$ (D) $O(n \log n)$
19. In a doubly linked list, each node contains
 (A) Only Data
 (B) Data and Pointer to next node
 (C) Data and pointers to both the next and previous nodes
 (D) Data and Pointer to previous node
20. The principle of a stack follows which rule?
 (A) FIFO (First In, First Out) (B) LIFO (Last In, First Out)
 (C) LILO (Last In, Last Out) (D) None of the these
21. To convert infix expression to prefix or postfix which data structure is preferable?
 (A) Array (B) Stack
 (C) Graph (D) Linked List
22. What does an assembler do in assembly language programming?
 (A) Converts machine code to assembly language
 (B) Converts assembly language to machine code
 (C) Converts high-level language to assembly language
 (D) Converts assembly language to high-level language
23. Assembly language is commonly used for
 (A) Web development (B) Low-level hardware programming
 (C) Mobile app development (D) Game development
24. Which of the following is NOT an advantage of assembly language?
 (A) Faster execution (B) Direct hardware control
 (C) Portability across different processor (D) Efficient memory usage

25. Which of the following is NOT a valid assembly language instruction?
 (A) MOV (B) ADD
(C) PRINT (D) CMP
26. Which of the following is not a type of constructor in the C++ Programming Language?
 (A) Copy constructor **(B) Friend constructor**
 (C) Default constructor (D) Parameterized constructor
27. Which of the following concepts means wrapping up of data and functions together?
 (A) Abstraction **(B) Encapsulation**
 (C) Inheritance (D) Polymorphism
28. Which of the following operations are performed by a constructor?
 (A) Construct a new class (B) Construct a new array
 (C) Construct a new function **(D) Initialize objects**
29. More than one user-defined function can have the same name and perform different operations. This feature of C++ Programming Language is known as _____.
 (A) Operator Overloading **(B) Function Overloading**
 (C) Type Conversion (D) None of these
30. _____ function is an external function that can access the private data members of a class in the C++ Programming Language.
(A) friend (B) protected
 (C) getdata() (D) None of these
31. C# is a programming language, developed by _____.
 (A) Oracle **(B) Microsoft**
 (C) GNU project (D) Google
32. Boxing in C# .NET allows the user to convert?
 (A) a reference type to a value type **(B) a value type to a reference type**
 (C) a value type to other value type (D) a reference type to other reference type
33. In C# .NET, the data members of a class are, by default,?
 (A) protected, public (B) private, public
(C) private (D) public
34. Which of the following keywords is used to refer to the base class constructor from the subclass constructor in C#?
 (A) this (B) static
(C) base (D) extend
35. What is the purpose of the "using" keyword in C#?
(A) To import a namespace (B) To create a new object
 (C) To define a method (D) To declare a variable
36. Which statement is used to skip the current iteration of a loop in Python?
 (A) break **(B) continue**
 (C) pass (D) return
37. What will be the output of math.sqrt(16) in Python?
(A) 4 (B) 16
 (C) Error (D) None

38. Which of the following is not a principle of Agile development?
(A) Customer collaboration (B) Comprehensive documentation
(C) Responding to change (D) Working software
39. Which of the following is a type of Software Testing?
(A) Gray Box Testing (B) White Box Testing
(C) Black Box Testing (D) All of these
40. Which of the following is not a software process model?
(A) Waterfall model (B) Agile model
(C) Hardware model (D) Spiral model
41. A class in the class diagram(UML) is divided into which compartments?
(A) Name compartment (B) Attribute compartment
(C) Operation compartment (D) All of these
42. What is the main advantage of using UML in software development?
(A) It speeds up coding
(B) It provides a standardized way to visualize system design
(C) It eliminates the need for testing
(D) It replaces programming languages
43. What is Cross-Site Scripting (XSS)?
(A) A method to improve website speed
(B) A security vulnerability where attackers inject malicious scripts
(C) A way to encrypt web pages
(D) A technique for styling web pages
44. Which of the following is a server-side scripting language?
(A) HTML (B) CSS
(C) PHP (D) JavaScript
45. What is the purpose of AJAX in web development?
(A) To create animations
(B) To manage databases
(C) To style web pages
(D) To update web pages without reloading of the entire page
46. Which of the following is not an example of a DBMS?
(A) MySQL (B) Microsoft Access
(C) IBM DB2 (D) Google
47. The uniqueness of each row in a database table is ensured by
(A) Primary Key (B) Foreign Key
(C) Index (D) Trigger
48. What does ACID stand for in database transactions?
(A) Atomicity, Consistency, Isolation, Durability
(B) Accuracy, Control, Integrity, Data
(C) Access, Configuration, Isolation, Dependence
(D) Atomicity, Complexity, Integration, Distribution

49. What is the purpose of an Entity-Relationship (ER) diagram?
 (A) To document the syntax of SQL (B) To model physical database storage
(C) To illustrate database relationships (D) To monitor database performance
50. Which of the following makes a transaction permanent in the database?
 (A) Rollback **(B) Commit**
 (C) Savepoint (D) Flashback
51. Blockchain is based on which type of structure?
 (A) Array (B) Stack
(C) Linked List (D) Tree
52. Which of the following is a key enabler of 5G networks?
 (A) IPv4 **(B) Massive MIMO**
 (C) Dial-up Modem (D) USB
53. Quantum computing uses units known as:
 (A) Bits (B) Registers
(C) Qubits (D) Logic gates
54. The primary goal of edge computing is to:
 (A) Centralize data (B) Increase latency
 (C) Reduce load on local networks **(D) Process data closer to the source**
55. The binary equivalent of decimal 13 is:
(A) 1101 (B) 1010
 (C) 1110 (D) 1001
56. Microcontrollers are best suited for:
 (A) Desktop computing (B) Game development
(C) Embedded systems (D) Cloud storage
57. A language accepted by a finite automaton is:
 (A) Recursive **(B) Regular**
 (C) Context-Free (D) Context-Sensitive
58. SR latch is formed using:
 (A) NAND gates (B) NOR gates
 (C) XOR gates **(D) Both 1 and 2**
59. Which of the following is volatile memory?
 (A) ROM (B) Flash
(C) DRAM (D) EEPROM
60. Which logic gate is used in parity generation?
 (A) AND (B) OR
(C) XOR (D) NAND
61. If all malware is software, and some software is open-source, which of the following must be true?
 (A) Some malware is open-source (B) All software is malware
 (C) All malware is open-source **(D) Malware is a type of software**
62. A password must consist of 3 letters followed by 3 digits. How many different passwords can be created using English letters and digits (no repetition)?
 (A) 15,600,000 **(B) 12,484,800**
 (C) 13,200,000 (D) 10,000,000

63. Identify the pattern: Login attempts: 2, 4, 8, 16, ?
 (A) 18 (B) 24
 (C) 32 (D) 20
64. In binary, what is the result of 1011 AND 1101?
 (A) 1001 (B) 1010
 (C) 1110 (D) 1101
65. Pointing to a person, John said, "He is the son of my grandfather's only son." How is John related to the person?
 (A) Father (B) Cousin
 (C) Brother (D) Uncle
66. Which word does not belong with the others?
 (A) Apple (B) Banana
 (C) Mango (D) Carrot
67. Statement: Some hackers are experts. All experts are intelligent. Conclusion I: Some hackers are intelligent. Conclusion II: All hackers are intelligent.
 (A) Only I follows (B) Only II follows
 (C) Both follow (D) Neither follows
68. Observe the pattern: 1, 4, 9, 16, ?, 36
 (A) 25 (B) 20
 (C) 24 (D) 28
69. Which machine can accept a context-free language?
 (A) DFA (B) NFA
 (C) Pushdown Automation(PDA) (D) Turing Machine
70. A Turing machine differs from a PDA because it:
 (A) Uses a queue (B) Has limited memory
 (C) Has a stack instead of tape (D) Has infinite tape and can overwrite symbols
71. The difference between DFA and NFA is:
 (A) Multiple transitions (B) Only one final state
 (C) Epsilon transitions (D) Stack
72. A regular language is:
 (A) Accepted by TM (B) Generated by regular grammar
 (C) Not closed under union (D) Not closed under intersection
73. Regular languages are:
 (A) Closed under complementation (B) Not closed under union
 (C) Not closed under Kleene star (D) None
74. Which machine recognizes context-free languages?
 (A) DFA (B) NFA
 (C) PDA (D) TM
75. A language is recursively enumerable if:
 (A) DFA accepts it (B) TM accepts it
 (C) CFG generates it (D) NFA recognizes it

76. Which of the following machines has the maximum computational power?
 (A) DFA (B) NFA
 (C) PDA (D) Turing Machine
77. A language L is accepted by a Turing Machine. Which of the following is necessarily true?
 (A) L is recursive (B) L is context-free
 (C) L is recursively enumerable (D) L is regular
78. Which of the following cannot be accepted by any Turing machine?
 (A) Empty language
 (B) Language of all Turing machines that halt on empty input
 (C) Set of all palindromes over {a, b}
 (D) Language $\{a^n b^n c^n \mid n \geq 1\}$
79. Let $L = \{w \in \{0,1\}^* \mid w \text{ has even number of 0's and odd number of 1's}\}$. Which of the following can be used to accept L?
 (A) DFA (B) PDA
 (C) Turing Machine (D) NFA
80. Which of the following is not a type of grammar as per Chomsky hierarchy?
 (A) Type 0 (B) Type 1
 (C) Type 3 (D) Type 4
81. Who is the current Secretary-General of the United Nations (2025)?
 (A) António Guterres (B) Ban Ki-moon
 (C) Kofi Annan (D) Javier Pérez de Cuéllar
82. Which country hosted the 2024 Summer Olympics?
 (A) China (B) France
 (C) USA (D) Japan
83. Who is the current Chairperson of the NITI Aayog (2025)?
 (A) Narendra Modi (B) Amit Shah
 (C) Arvind Panagariya (D) Rajiv Kumar
84. The James Webb Space Telescope was launched in which year?
 (A) 2020 (B) 2021
 (C) 2022 (D) 2019
85. What is the theme of World Environment Day 2025?
 (A) Beat Plastic Pollution (B) Ecosystem Restoration
 (C) Biodiversity Matters (D) Climate Action
86. Known as 'Iron Man of India'?
 (A) Jawaharlal Nehru (B) Sardar Vallabhbhai Patel
 (C) Lal Bahadur Shastri (D) Bhagat Singh
87. Fastest planet orbiting the Sun?
 (A) Mercury (B) Venus
 (C) Mars (D) Earth
88. WHO established in which year?
 (A) 1945 (B) 1948
 (C) 1950 (D) 1952

89. DNA stands for?
(A) Deoxyribonucleic Acid (B) Dicarboxylic Acid
(C) Deoxyribonuclear Acid (D) Deoxyribose Nucleic Acid
90. SI unit of electric current?
(A) Volt (B) Ampere
(C) Ohm (D) Watt
91. Neither the teacher nor the students _____ present in the class.
(A) was (B) were
(C) has been (D) is
92. If I _____ more time, I would have finished the project.
(A) had (B) have had
(C) had had (D) would have
93. She speaks French _____ than her brother.
(A) fluent (B) more fluently
(C) most fluently (D) fluentlier
94. The report _____ by the committee before it was published.
(A) is reviewed (B) was reviewed
(C) has been reviewed (D) reviewed
95. He is one of the players who _____ performed well this season.
(A) has (B) have
(C) having (D) was
96. The jury _____ divided in their opinions.
(A) was (B) were
(C) has (D) have
97. Had she known about the traffic, she _____ earlier.
(A) leaves (B) left
(C) would have left (D) will leave
98. He is the _____ of the two brothers.
(A) tall (B) taller
(C) tallest (D) more tall
99. By the time we arrived, the movie _____.
(A) had started (B) has started
(C) started (D) was started
100. Not only the books but also the pen _____ missing.
(A) are (B) were
(C) is (D) have