1. The physical layer is concerned with

   (A) bit-by-bit delivery
   (B) process to process delivery
   (C) application to application delivery
   (D) port to port delivery

2. When 2 or more bits in a data unit has been changed during the transmission, the error is called

   (A) random error
   (B) burst error
   (C) inverted error
   (D) double error

3. The technique of temporarily delaying outgoing acknowledgments so that they can be hooked onto the next outgoing data frame is called

   (A) piggybacking
   (B) cyclic redundancy check
   (C) fletcher's checksum
   (D) parity check

4. Which one of the following is not a function of network layer?

   (A) routing
   (B) inter-networking
   (C) congestion control
   (D) error control

5. Which of the following is not a type of cloud server?

   (A) Public Cloud Servers
   (B) Private Cloud Servers
   (C) Dedicated Cloud Servers
   (D) Merged Cloud Servers

6. Which of the following is the application of cloud computing?

   (A) Adobe
   (B) Paypal
   (C) Google G Suite
   (D) All of the above

7. Point out the wrong statement.

   (A) Azure enables .NET Framework applications to run over the Internet
   (B) Cloud Computing has two distinct sets of models
   (C) Amazon has built a worldwide network of data centers to service its search engine
   (D) None of the mentioned

8. ———————— is a cloud computing service model in which hardware is virtualized in the cloud.

(A) IaaS (B) CaaS
(C) PaaS (D) None of the mentioned

9. ———————— serves as a PaaS vendor within Google App Engine system.

(A) Google (B) Amazon
(C) Microsoft (D) All of the mentioned

10. Which of the following is the most complete cloud computing service model?

(A) PaaS (B) IaaS
(C) CaaS (D) SaaS

11. Which of the following is the pin efficient method of communicating between other devices?

(A) serial port (B) parallel port
(C) peripheral port (D) memory port

12. Which statement replaces all occurrences of the identifier with string?

(A) # define identifier string (B) # include
(C) # define MACRO() (D) # ifdef

13. Which language is used for styling web pages?

(A) HTML (B) CSS
(C) JavaScript (D) Python

14. What is the purpose of the alt attribute in the <img> tag?

(A) To provide a link to the image source
(B) To set the size of the image
(C) To provide alternative text when the image cannot be displayed
(D) To apply styling to the image

15. Which protocol is used for secure data transfer on the web?

(A) HTTP (B) FTP
(C) HTTPS (D) TCP

16. What does AJAX stand for?

(A) Asynchronous JavaScript and XML
(B) Advanced JavaScript and XHTML
(C) Asynchronous JSON and XML
(D) Automatic JavaScript and XML

17. What is the purpose of the <form> element in HTML?

(A) To create links to other web pages
(B) To define the layout of a web page
(C) To display images on a web page
(D) To create an interactive input form for user input

18. _____ authentication requires the outside use of a network security or trust service.

(A) SSO
(B) Single factor
(C) Multi Factor
(D) All of the mentioned

19. Which of the following can be used for the banking industry?

(A) athenahealth
(B) bankserve
(C) bankingsol
(D) all of the mentioned

20. _____ as a Service is a hosted application that is the cloud equivalent of a traditional desktop application.

(A) Software
(B) Platform
(C) Analytics
(D) Compliance

21. Which was the first free hosted Webmail service to the user?

(A) Hotmail
(B) Yahoo mail
(C) Google mail
(D) All of the mentioned

22. Which of the following is not a backup category?

(A) Full system backup
(B) Half system backup
(C) Image backup
(D) All of the mentioned

23. The amount of time needed to backup a system is referred to as its

(A) backup time
(B) backup sheet
(C) backup window
(D) all of the mentioned

24. Which of the following task swapping method is a better choice in the embedded systems design?

(A) time slice
(B) RMS
(C) cooperative multitasking
(D) pre-emptive

25. Which of the following is not a primitive data type in Java?

(A) int
(B) double
(C) string
(D) char

26. What is the correct syntax to define a method in Java?

(A) method name() {}
(B) methodName() {}
(C) void methodName() {}
(D) int methodName {}

27. What does the 'static' keyword mean in Java?

(A) The method cannot be overridden
(B) The variable is constant and cannot be changed
(C) The method belongs to the class, not an instance
(D) The variable can only be accessed within the class

28. What is the correct way to create a single-dimensional array in Java?

(A) int[] arr = new int[5];
(B) int arr = new int[5];
(C) int[5] arr = new int[];
(D) int[] arr = new int();

29. What is the output of the following code?

```
String str = "Hello";
str += " World";
System.out.println(str);
```

(A) Hello
(B) World
(C) HelloWorld
(D) Compilation error

30. What is the purpose of the 'try', 'catch', and 'finally' blocks in Java?

(A) To handle exceptions
(B) To define loops
(C) To create objects
(D) To stop program execution

31. In Java, which keyword is used to define a constant variable?

(A) final (B) const
(C) static (D) constant

32. What is the space complexity of a doubly linked list?

(A) O(1) (B) O(n)
(C) O(log n) (D) O(n log n)

33. Which operation is more efficient to perform in a doubly linked list?

(A) Insertion at the beginning (B) Insertion at the end
(C) Deletion from the beginning (D) Deletion from the end

34. What is the time complexity to delete a node from the beginning of a singly linked list?

(A) O(1) (B) O(n)
(C) O(log n) (D) O(n log n)

35. Which data structure can be used to implement a stack efficiently?

(A) Array (B) Linked List
(C) Hash Table (D) Binary Search Tree

36. What is the correct way to convert a string to lowercase in C?

(A) tolower(str); (B) strlwr(str);
(C) lower(str); (D) lowstr(str);

37. In Java, polymorphism is achieved through which two mechanisms?

(A) Inheritance and interfaces (B) Encapsulation and inheritance
(C) Abstraction and encapsulation (D) Encapsulation and interfaces

38. In method overriding, the method in the subclass must have the same

(A) Return type and method name (B) Method name and access modifier
(C) Method name and parameters (D) Return type and parameters

39. What is the purpose of the "destroy()" method in applets?

(A) It is called when the applet is first initialized
(B) It is called when the applet is stopped or the browser is closed
(C) It is called when the applet's window is resized
(D) It is called when the applet is repainted

40. What is the purpose of the "codebase" attribute in the <applet> tag?

(A) It specifies the location of the applet's class file
(B) It sets the background color of the applet
(C) It defines the size of the applet window
(D) It specifies the alignment of the applet on the page

41. The "→" operator in C is used with pointers that point to

(A) Arrays (B) Functions
(C) Structures (D) Characters

42. What is the main advantage of using recursion in certain problems?

(A) It results in faster execution compared to iterative solutions
(B) It allows solving complex problems with simpler code
(C) It eliminates the need for base cases
(D) It guarantees a reduction in memory usage

43. Which method is called automatically when an object is created in Java?

(A) main() (B) init()
(C) start() (D) constructor

44. What is the wrapper class for the primitive data type "int" in Java?

(A) Integer (B) Int
(C) IntWrapper (D) intWrapper

45. Which method is called automatically when an object is no longer referenced and needs to be garbage collected?

(A) delete() (B) clean()
(C) finalize() (D) gc()

46. What is the purpose of the "synchronized" keyword in Java?

(A) To prevent method overriding
(B) To ensure only one instance of a class can exist
(C) To prevent thread interference during concurrent access
(D) To allow the creation of atomic methods

47. In Java, which keyword is used to implement method overloading?

(A) override
(B) overload
(C) over
(D) None, method overloading is automatic in Java

48. What is the benefit of using inheritance in Java?

(A) It reduces code complexity and improves reusability
(B) It allows creating multiple instances of a class
(C) It guarantees encapsulation of data
(D) It ensures polymorphism in the code

49. What is the keyword used to call the superclass's constructor from the subclass in Java?

(A) this (B) super
(C) parent (D) base

50. What happens when you try to dequeue an element from an empty queue?

(A) It will return NULL
(B) It will throw a runtime exception
(C) It will remove the last element from the queue
(D) It will return an error code

51. What is the time complexity of finding the minimum value in a binary search tree?

(A) O(1) (B) O(log n)
(C) O(n) (D) O(n log n)

52. Consider a binary tree T that has 200 leaf nodes. Then, the number of nodes in T that have exactly two children are

(A) 199 (B) 200
(C) Any number between 0 and 199 (D) Any number between 100 and 200

53. In an AVL tree, after performing an insertion or deletion operation, how is the balance factor of a node updated?

(A) By subtracting the height of the left subtree from the height of the right subtree
(B) By adding the height of the left subtree to the height of the right subtree
(C) By updating the height of the node's left and right subtrees
(D) By comparing the heights of the left and right subtrees

54. In an AVL tree, what is the balance factor of a node with no children?

(A) –1 (B) 0
(C) 1 (D) Undefined

55. Which of the following data structures can be used to implement a priority queue?

(A) Array (B) List
(C) Binary search tree (D) Heap

56. Which graph traversal algorithm guarantees the shortest path from the starting node to all other nodes in a weighted graph with non-negative edge weights?

(A) Depth-First Search (DFS) (B) Breadth-First Search (BFS)
(C) Dijkstra's Algorithm (D) Prim's Algorithm

57. A multi-core CPU contains

(A) Multiple ALUs but a single control unit
(B) Multiple control units but a single ALU
(C) Multiple ALUs and multiple control units
(D) A single ALU and a single control unit

58. The clock speed of a CPU is measured in

(A) Megahertz (MHz) (B) Gigabytes (GB)
(C) Kilobytes (KB) (D) Terabytes (TB)

59. The concept of virtual memory allows the computer system to:

(A) Access a larger cache memory than the actual cache size
(B) Access a larger physical memory than the actual RAM size
(C) Execute instructions in parallel using multiple cores
(D) Execute multiple instructions in a single clock cycle

60. Which of the following statements is true regarding DMA and interrupts?

(A) DMA and interrupts are completely unrelated concepts in computer architecture
(B) DMA cannot generate interrupts as it operates independently of the CPU
(C) DMA can generate interrupts to notify the CPU about the completion of data transfer
(D) Interrupts are used to speed up DMA data transfer operations

61. The DMA controller is responsible for

(A) Managing the CPU's cache memory
(B) Handling the movement of data between CPU registers and memory
(C) Controlling the flow of data between I/O devices and memory
(D) Performing arithmetic and logical operations on data

62. In a pipelined processor, if a branch instruction is mispredicted, what corrective action is taken?

(A) Flushing the pipeline and restarting execution from the correct branch target
(B) Continuing execution without any corrective action
(C) Stalling the pipeline until the correct branch target is known
(D) Re-fetching all the instructions after the branch instruction

63. A control hazard occurs when

(A) Two instructions depend on the same data
(B) The CPU encounters an incorrect instruction
(C) There is a branch or jump instruction that changes the flow of execution
(D) The data bus is not wide enough to accommodate the instruction size

64. Associative memory is also known as

(A) Cache memory
(B) Content-addressable memory (CAM)
(C) Virtual memory
(D) Dynamic random-access memory (DRAM)

65. Virtual memory is a technique that

(A) Uses secondary storage as an extension of physical memory
(B) Utilizes cache memory to speed up data access
(C) Allocates memory to different user processes in a time-sliced manner
(D) Allocates memory to processes based on their priority

66. What is the purpose of the page table in a paging memory management scheme?

(A) To store the actual data of a process
(B) To divide memory into fixed-size blocks
(C) To translate virtual addresses to physical addresses
(D) To allocate memory to processes dynamically

67. In a demand paging system, the term "page fault" refers to

(A) The act of loading a page from disk to memory
(B) The inability to locate a page in the page table
(C) The act of evicting a page from memory to disk
(D) The occurrence when a program requests a page that is not in memory

68. Which of the following is a common page replacement algorithm that uses a reference bit for each page to determine if it has been used recently?

(A) Least Recently Used (LRU)
(B) First-In-First-Out (FIFO)
(C) Optimal Page Replacement (OPR)
(D) Random Page Replacement

69. The Belady's anomaly is associated with which page replacement algorithm?

(A) Optimal Page Replacement (OPR)
(B) Least Recently Used (LRU)
(C) First-In-First-Out (FIFO)
(D) Random Page Replacement

70. The process of freeing up memory space by combining small blocks of free memory into larger ones is called

(A) Swapping
(B) Compaction
(C) Segmentation
(D) Fragmentation

71. In a multi-level page table scheme, the outer page table is also known as the

(A) Global page table
(B) Inverted page table
(C) Master page table
(D) Parent page table

72. _____ are useful in SQL update statements, where they can be used in the set clause.

(A) Multiple queries
(B) Sub queries
(C) Update
(D) Scalar subqueries

73. In SQL the statement select * from R, S is equivalent to

(A) Select * from R natural join S
(B) Select * from R cross join S
(C) Select * from R union join S
(D) Select * from R inner join S

74. Domain constraints, functional dependency and referential integrity are special forms of

(A) Foreign key
(B) Primary key
(C) Assertion
(D) Referential constraint

75. The CREATE TRIGGER statement is used to create the trigger. THE _____ clause specifies the table name on which the trigger is to be attached. The _____ specifies that this is an AFTER INSERT trigger.

(A) For insert, on
(B) On, for insert
(C) For, insert
(D) None of the mentioned

76. Data integrity constraints are used to:

(A) Control who is allowed access to the data
(B) Ensure that duplicate records are not entered into the table
(C) Improve the quality of data entered for a specific property
(D) Prevent users from changing the values stored in the table

77. The total participation by entities is represented in E-R diagram as

(A) Dashed line
(B) Double line
(C) Double rectangle
(D) Circle

78. Which of the following is a low level operator?

(A) Insert
(B) Update
(C) Delete
(D) Directory

79. A primary key is combined with a foreign key creates

(A) Parent-Child relationship between the tables that connect them
(B) Many to many relationship between the tables that connect them
(C) Network model between the tables that connect them
(D) None of the mentioned

80. Which software development model is characterized by short iterations and frequent feedback from users?

(A) Waterfall model
(B) Agile model
(C) V-model
(D) Spiral model

81. The first step in the software development process is

(A) Testing (B) Design
(C) Maintenance (D) Requirements gathering

82. The process of finding and fixing defects or issues in software is known as

(A) Validation (B) Verification
(C) Debugging (D) Testing

83. RAD Software process model stands for

(A) Rapid Application Development (B) Relative Application Development
(C) Rapid Application Design (D) Recent Application Development

84. COCOMO stands for

(A) COnsumed COst MOdel (B) COnstructive COst MOdel
(C) COmmon COntrol MOdel (D) COmposition COst Model

85. Which is the most important feature of spiral model?

(A) Quality management (B) Risk management
(C) Performance management (D) Efficiency management

86. The model in which the requirements are implemented by its category is

(A) Evolutionary Development Model (B) Waterfall Model
(C) Prototyping (D) Iterative Enhancement Model

87. Which normal form allows multi-valued attributes in a relation?

(A) First Normal Form (1NF) (B) Second Normal Form (2NF)
(C) Third Normal Form (3NF) (D) Fourth Normal Form (4NF)

88. Which of the following indicates the maximum number of entities that can be involved in a relationship?

(A) Minimum cardinality (B) Maximum cardinality
(C) ERD (D) Greater Entity Count

89. Tables in second normal form (2NF)

(A) Eliminate all hidden dependencies
(B) Eliminate the possibility of a insertion anomalies
(C) Have a composite key
(D) Have all non-key fields depend on the whole primary key

90. The property of a transaction that ensures that its changes are persistent and survive system failures is known as

(A) Consistency
(B) Atomicity
(C) Isolation
(D) Durability

91. Which of the following is an example of a situation that may lead to a deadlock in a database system?

(A) A transaction reads data that is being updated by another transaction
(B) Two transactions lock the same resource and wait for each other indefinitely
(C) A transaction reads inconsistent data from the database
(D) A transaction is committed before it completes all its operations

92. The number of transactions executed in a given amount of time is called

(A) Utilization
(B) Execution rate
(C) Throughput
(D) Atomicity

93. A transaction can do read and write operation on a data item when it acquires

(A) read mode
(B) exclusive mode
(C) shared mode
(D) write mode

94. Which of the following is an example of a self-closing HTML tag?

(A) <p>
(B) <a>
(C)
(D)

95. Which programming language is commonly used for server-side web development?

(A) Java
(B) JavaScript
(C) C++
(D) PHP

96. For exporting movie into SWF format which element is used?

(A) <object>
(B) <video>
(C) <datalist>
(D) <dd>

97. If a subclass has a method with the same name and parameters as a method in its superclass, it is called

(A) Method hiding
(B) Method overloading
(C) Method overriding
(D) Method redefining

98. How do you dynamically allocate memory for an integer variable using a pointer in C?

(A) ptr = (int)malloc(sizeof(int));
(B) ptr = new int();
(C) ptr = malloc(int);
(D) ptr = allocate(int);

99. How can you dynamically allocate memory for an integer array in C?

(A) array = malloc(sizeof(int) * size);
(B) array = new int[size];
(C) array =calloc(size);
(D) array = calloc(* sizeof(int));

100. What happens if you dereference a null pointer in C?

(A) It will crash the program
(B) It will display a warning but continue execution
(C) It will print the address of the pointer
(D) It will invoke undefined behavior

101. What is a memory leak in C?

(A) When a pointer points to an invalid memory address
(B) When a pointer is not initialized
(C) When a pointer is deallocated before it is used
(D) When dynamically allocated memory is not deallocated properly

102. What is the correct way to return an array from a function in C?

(A) By returning the array directly
(B) By returning a pointer to the array
(C) By returning the array's first element
(D) By using a global array variable

103. Which of the following is the time complexity of performing a BFS on a graph with V vertices and E edges?

(A) $O(V)$
(B) $O(E)$
(C) $O(V+E)$
(D) $O(V*E)$

104. What does $O(f(n))$ represent in asymptotic notation?

(A) The best-case time complexity of an algorithm
(B) The average-case time complexity of an algorithm
(C) The worst-case time complexity of an algorithm
(D) The exact running time of an algorithm

105. Which of the following sorting algorithms inherently requires additional memory or auxiliary space for sorting?

(A) Quick Sort
(B) Merge Sort
(C) Bubble Sort
(D) Insertion Sort

106. Merge Sort is a stable sorting algorithm. What does "stable" mean in this context?

(A) The algorithm has a predictable time complexity
(B) The original order of equal elements is preserved after sorting
(C) The algorithm always sorts the elements in ascending order
(D) The algorithm uses a stable data structure to store the elements

107. The worst-case time complexity of Quick Sort is

(A) $O(n)$
(B) $O(n \log n)$
(C) $O(n^2)$
(D) $O(\log n)$

108. The Floyd-Warshall algorithm is used to find

(A) The shortest path between a pair of nodes in a graph
(B) The minimum spanning tree of a graph
(C) The longest path in a graph
(D) The Eulerian path of a graph

109. The time complexity of a Dynamic Programming solution depends on the number of

(A) Subproblems and the time it takes to solve each subproblem
(B) Iterations in the outer loop of the algorithm
(C) Input elements in the problem
(D) Available memory in the system

110. Which of the following problems is NOT typically solved using Dynamic Programming?

(A) Finding the shortest path in a graph
(B) Calculating the factorial of a number
(C) Determining the longest common subsequence of two strings
(D) Knapsack problem - maximizing value while staying within a given weight limit

111. Which of the following is not an operating system?

(A) Windows (B) Linux
(C) Oracle (D) DOS

112. A Process Control Block (PCB) in an operating system

(A) Contains the actual data of a process
(B) Is a table of memory addresses for each process
(C) Stores information about a process, such as its current state and register values
(D) Is used to allocate memory to a process

113. A system contains three programs and each requires three tape units for its operation. The minimum number of tape units which the system must have such that deadlocks never arise is

(A) 6 (B) 7
(C) 8 (D) 9

114. Which of the following is NOT a valid deadlock prevention scheme?

(A) Release all resources before requesting a new resource
(B) Number the resources uniquely and never request a lower numbered resource than the last one requested
(C) Never request a resource after releasing any resource
(D) Request and all required resources be allocated before execution

115. Which of the following is a common application of associative memory?

(A) Storing data in the CPU registers
(B) Implementing hash tables in computer programs
(C) Storing BIOS firmware in a computer system
(D) Storing files in secondary storage devices like hard drives

116. What is the key feature that distinguishes associative memory from conventional memory types?

(A) Its non-volatile nature
(B) Its ability to store data in compressed form
(C) Its ability to perform data searches based on content
(D) It's extremely high storage capacity

117. The IEEE 754 single-precision floating-point format uses how many bits to represent a floating-point number?

(A) 8 bits (B) 16 bits
(C) 32 bits (D) 64 bits

118. The TLB (Translation Lookaside Buffer) is used to speed up

(A) Disk I/O operations
(B) Address translation in virtual memory
(C) Context switching between processes
(D) Memory deallocation operations

119. What does the term "dirty bit" represent in the context of memory management?

(A) A flag indicating whether a page has been accessed recently
(B) A flag indicating that the page contains invalid data
(C) A flag indicating that the page needs to be written back to disk before replacement
(D) A flag indicating that the page is marked for pre-fetching

120. The state of a process that is waiting for some event to occur is known as

(A) Running (B) Ready
(C) Blocked (D) Terminated

121. The process of suspending a process and storing its state in memory or disk to be resumed later is known as

(A) Preemption (B) Context switching
(C) Swapping (D) Blocking

122. When a philosopher successfully picks up both forks, he enters the ————— state.

(A) Hungry (B) Thinking
(C) Eating (D) Deadlock

123. In the Dining Philosophers Problem, a deadlock occurs when

(A) A philosopher picks up two forks simultaneously

(B) All philosophers pick up their respective forks at the same time

(C) All philosophers pick up one fork and wait indefinitely for the second fork

(D) All philosophers drop their forks simultaneously

124. Which of the following is NOT a commonly used disk scheduling algorithm?

(A) First-Come-First-Serve (FCFS)

(B) Shortest Seek Time First (SSTF)

(C) Round Robin (RR)

(D) SCAN

125. Which branch-and-bound technique is often used to solve the Traveling Salesman Problem (TSP) optimally for small instances?

(A) Kruskal's algorithm

(B) Prim's algorithm

(C) Bellman-Ford algorithm

(D) Held-Karp algorithm

126. Which string matching algorithm is often used for multiple pattern matching in a single pass over the input text?

(A) Knuth-Morris-Pratt algorithm

(B) Aho-Corasick algorithm

(C) Rabin-Karp algorithm

(D) Boyer-Moore algorithm

127. The Knuth-Morris-Pratt (KMP) algorithm is used to efficiently find

(A) All occurrences of a pattern in a text

(B) The longest common subsequence of two strings

(C) The shortest substring containing all characters of the pattern

(D) The shortest palindrome in a text

128. CISC architecture includes a wide variety of instructions, which may take multiple clock cycles to execute. This is known as

(A) Pipelining

(B) Superscalar execution

(C) Microcode execution

(D) Variable instruction latency

129. Which architecture uses load-store instructions for memory access?

(A) RISC
(B) CISC
(C) Both RISC and CISC
(D) Neither RISC nor CISC

130. The primary purpose of the Memory Management Unit (MMU) is to

(A) Manage the allocation of cache memory
(B) Manage the flow of data between CPU and RAM
(C) Control the translation of virtual addresses to physical addresses
(D) Control the clock frequency of the CPU

131. A system has 6 identical resources and N processes competing for them. Each process can request at most 2 resources. Which one of the following values of N could lead to a deadlock?

(A) 2
(B) 3
(C) 4
(D) 5

132. What type of scheduling is round-robin scheduling?

(A) Linear data scheduling
(B) Non-linear data scheduling
(C) Preemptive scheduling
(D) Non-preemptive scheduling

133. Which of the following mechanisms is a locking mechanism?

(A) Semaphore
(B) PCB
(C) Mutex
(D) Binary Semaphore

134. A user level process in Unix traps the signal sent on a Ctrl-C input, and has a signal handling routine that saves appropriate files before terminating the process. When a Ctrl-C input is given to this process, what is the mode in which the signal handling routine executes?

(A) Kernel mode
(B) Superuser mode
(C) Privileged mode
(D) User mode

135. A critical section is a program segment

(A) Which should run in a certain specified amount of time
(B) Which avoids deadlocks
(C) Where shared resources are accessed
(D) Which must be enclosed by a pair of semaphore operations, P and V

136. Which of the following is not true with respect to deadlock prevention and deadlock avoidance schemes?

(A) In deadlock prevention, the request for resources is always granted if resulting state is safe

(B) In deadlock avoidance, the request for resources is always granted, if the resulting state is safe

(C) Deadlock avoidance requires knowledge of resource requirements a priori

(D) Deadlock prevention is more restrictive than deadlock avoidance

137. What is the primary purpose of memory management in an operating system?

(A) To allocate memory for user applications

(B) To ensure data is stored in secondary storage devices

(C) To prevent unauthorized access to memory

(D) To optimize the utilization of physical memory resource

138. In dirty read problem

(A) One transaction reads an uncommitted value of another transaction

(B) One transaction reads the committed value for another transaction

(C) One transaction reads another transaction

(D) One transaction commits another transaction

139. What is a "phantom read" in the context of database transactions?

(A) When a transaction reads data that has been modified by another transaction

(B) When a transaction reads data that was not present during the initial read

(C) When a transaction reads data without acquiring any locks

(D) When a transaction reads data that was not committed by another transaction

140. In two-phase locking protocol, a transaction obtains locks in ————— phase.

(A) Shrinking phase (B) Growing phase

(C) Running phase (D) Initial phase

141. Which protocol permits release of exclusive locks only at the end of transaction?

(A) Graph based protocol (B) Strict two-phase locking protocol

(C) Two phase locking protocol (D) Rigorous Two-phase locking protocol

142. Relational Algebra does not have

(A) Selection operator (B) Projection operator

(C) Aggregation operator (D) Division operator

143. The common column is eliminated in

(A) Theta join
(B) Outer join
(C) Natural join
(D) Composed join

144. Relational calculus is a

(A) Procedural language
(B) Non-Procedural language
(C) Data definition language
(D) High level language

145. Which testing is the re-execution of some subset of tests that have already been conducted to ensure the changes that are not propagated?

(A) Unit testing
(B) Regression testing
(C) Integration testing
(D) Thread-based testing

146. Software Requirement Specification (SRS) is also known as specification of

(A) White box testing
(B) Acceptance testing
(C) Integrated testing
(D) Black box testing

147. Which of the following property does not correspond to a good Software Requirements Specification (SRS)?

(A) Verifiable
(B) Ambiguous
(C) Complete
(D) Traceable

148. Which two requirements are given priority during Requirement Management of a product?

(A) User and Developer
(B) Functional and Non-functional
(C) Enduring and Volatile
(D) All of the mentioned

149. The UML supports event-based modelling using ———————— diagrams.

(A) Deployment
(B) Collaboration
(C) State chart
(D) All of the mentioned

150. Cohesion is a qualitative indication of the degree to which a module

(A) Can be written more compactly
(B) Focuses on just one thing
(C) Is able to complete its function in a timely manner
(D) Is connected to other modules and the outside world

151. The amount of time that the software is available for use is known as

(A) Reliability
(B) Usability
(C) Efficiency
(D) Functionality

152. What are the four dimensions of Dependability?

(A) Usability, Reliability, Security, Flexibility
(B) Availability, Reliability, Maintainability, Security
(C) Availability, Reliability, Security, Safety
(D) Security, Safety, Testability, Usability

153. Which of the following approaches are used to achieve reliable systems?

(A) Fault prevention
(B) Fault removal
(C) Fault tolerance
(D) All of the mentioned

154. The SRS is said to be consistent if and only if

(A) Its structure and style are such that any changes to the requirements can be made easily while retaining the style and structure
(B) Every requirement stated therein is one that the software shall meet
(C) Every requirement stated therein is verifiable
(D) No subset of individual requirements described in it conflict with each other

155. Which one of the following allows a user at one site to establish a connection to another site and then pass keystrokes from local host to remote host?

(A) HTTP
(B) FTP
(C) Telnet
(D) TCP

156. Which one of the following is an internet standard protocol for managing devices on IP network?

(A) Dynamic host configuration protocol
(B) Simple network management protocol
(C) Internet message access protocol
(D) Media gateway protocol

157. When displaying a web page, the application layer uses the

(A) HTTP protocol
(B) FTP protocol
(C) SMTP protocol
(D) TCP protocol

158. The values GET, POST, HEAD etc are specified in ———————— of HTTP message.

(A) Request line
(B) Header line
(C) Status line
(D) Entity body

159. FTP server listens for connection on port number

(A) 20
(B) 21
(C) 22
(D) 23

160. DHCP (Dynamic Host Configuration Protocol) provides ———————— to the client.

(A) IP address
(B) MAC address
(C) URL
(D) None of the mentioned

161. After obtaining the IP address, to prevent the IP conflict the client may use

(A) Internet relay chat
(B) Broader gateway protocol
(C) Address resolution protocol
(D) None of the mentioned

162. The domain name system is maintained by

(A) Distributed database system
(B) A single server
(C) A single computer
(D) None of the mentioned

163. PPP consists of ———————— components.

(A) Two (encapsulating, the Domain Name system)
(B) Three (encapsulating, a link control protocol, Network Control Protocols)
(C) Two (a link control protocol, Simple Network Control protocol)
(D) One (Simple Network Control protocol)

164. In the SCAN disk scheduling algorithm, if there are no pending requests in the current direction, the arm

(A) Stops and remains idle until new requests arrive
(B) Reverses direction and starts scanning from the opposite end
(C) Jumps to the next request in the queue, regardless of its location
(D) Jumps to the farthest request and then scans back

165. The LOOK disk scheduling algorithm is an improvement over the SCAN algorithm because it

(A) Scans the disk using a circular fashion
(B) Ignores the disk request queue and moves the arm randomly
(C) Avoids unnecessary head movement by changing direction without reaching the end
(D) Prioritizes disk requests based on their arrival time

166. Which disk scheduling algorithm is generally considered the most efficient in terms of minimizing the seek time?

(A) First-Come-First-Serve (FCFS)
(B) Shortest Seek Time First (SSTF)
(C) C-SCAN
(D) Circular LOOK (C-LOOK)

167. The Linux kernel is written in which programming language?

(A) C++
(B) Java
(C) Python
(D) C

168. In Linux, the process ID (PID) of a running program can be found using the command

(A) pid
(B) getpid
(C) ps
(D) id

169. Thrashing ———————— the CPU utilization.

(A) Increases
(B) Keeps constant
(C) Decreases
(D) None of the mentioned

170. What is a locality?

(A) a set of pages that are actively used together
(B) a space in memory
(C) an area near a set of processes
(D) none of the mentioned

171. In the working set model, for: 2 6 1 5 7 7 7 7 5 1 6 2 3 4 1 2 3 4 4 4 3 4 3 4 4 4 1 3 2 3

if DELTA = 10, then the working set at time t_1 (….7 5 1) is?

(A) {1, 2, 4, 5, 6}
(B) {2, 1, 6, 7, 3}
(C) {1, 6, 5, 7, 2}
(D) {1, 2, 3, 4, 5}

172. Which protocol establishes the initial logical connection between a server and a client?

(A) Transmission control protocol
(B) User datagram protocol
(C) Mount protocol
(D) Datagram congestion control protocol

173. The Linux command "chmod" is used for

(A) Changing the system's date and time
(B) Creating a new user account
(C) Changing file permissions
(D) Displaying disk usage information

174. Which of the following condition is required for a deadlock to be possible?

(A) Mutual exclusion
(B) A process may hold allocated resources while awaiting assignment of other resources
(C) No resource can be forcibly removed from a process holding it
(D) all of the mentioned

175. Semaphore is a/an ———————— to solve the critical section problem.

(A) Hardware for a system
(B) Special program for a system
(C) Integer variable
(D) None of the mentioned

176. The strategy of making processes that are logically runnable to be temporarily suspended is called

(A) Non preemptive scheduling
(B) Preemptive scheduling
(C) Shortest job first
(D) First come First served

177. ICMP is primarily used for

(A) error and diagnostic functions
(B) Addressing
(C) Forwarding
(D) Routing

178. User datagram protocol is called connectionless because

(A) All UDP packets are treated independently by transport layer
(B) It sends data as a stream of related packets
(C) It is received in the same order as sent order
(D) It sends data very quickly

179. Socket-style API for windows is called

(A) wsock (B) winsock
(C) wins (D) Sockwi

180. Which of the following is a transport layer protocol?

(A) Stream control transmission protocol (B) Internet control message protocol
(C) Neighbor discovery protocol (D) Dynamic host configuration protocol

181. ———————— is the multiplexing technique that shifts each signal to a different carrier frequency.

(A) FDM (B) TDM
(C) Both FDM and TDM (D) PDM

182. ———————— topology requires a multipoint connection.

(A) Star (B) Mesh
(C) Ring (D) Bus

183. If link transmits 4000 frames per second, and each slot has 8 bits, the transmission rate of circuit this TDM is

(A) 32 kbps (B) 500 bps
(C) 500 kbps (D) 32 bps

184. Transmission delay does not depend on

(A) Packet length (B) Distance between the routers
(C) Transmission rate (D) Bandwidth of medium

185. What is the max data transfer rate for optical fiber cable?

(A) 10 Mbps (B) 100 Mbps
(C) 1000 Mbps (D) 10000 Mbps

186. Which of the following architecture uses the CSMA/CD access method?

(A) ARC net (B) Ethernet
(C) Router (D) STP server

187. Firewalls are often configured to block

(A) UDP traffic
(B) TCP traffic
(C) Sensitive traffic
(D) Best-effort traffic

188. In a network, If P is the only packet being transmitted and there was no earlier transmission, which of the following delays could be zero?

(A) Propagation delay
(B) Queuing delay
(C) Transmission delay
(D) Processing delay

189. Radio channels are attractive medium because

(A) Can penetrate walls
(B) Connectivity can be given to mobile user
(C) Can carry signals for long distance
(D) All of the mentioned

190. A local telephone network is an example of a ———————— network.

(A) Packet switched
(B) Circuit switched
(C) Bit switched
(D) Line switched

191. In ———————— systems, resources are allocated on demand.

(A) Packet switching
(B) Circuit switching
(C) Line switching
(D) Frequency switching

192. To deliver a message to the correct application program running on a host, the ———————— address must be consulted.

(A) IP
(B) MAC
(C) Port
(D) None of the mentioned

193. The ———————— operation allows the combining of two relations by merging pairs of tuples, one from each relation, into a single tuple.

(A) Select
(B) Join
(C) Union
(D) Intersection

194. A query in the tuple relational calculus is expressed as

(A) $\{t|P()|t\}$ (B) $\{P(t)|t\}$

(C) $\{t|P(t)\}$ (D) All of the mentioned

195. An attribute A of datatype varchar(20) has the value "Avi". The attribute B of datatype char(20) has value "Reed". Here attribute A has ———————— spaces and attribute B has ———————— spaces.

(A) 3, 20 (B) 20, 4

(C) 20, 20 (D) 3, 4

196. The union operation automatically ———————— unlike the select clause.

(A) Adds tuples (B) Eliminates unique tuples

(C) Adds common tuples (D) Eliminates duplicate

197. ———————— clause is an additional filter that is applied to the result.

(A) Select (B) Group-by

(C) Having (D) Order by

198. The SQL command used to modify the structure of an existing database table is

(A) ALTER (B) UPDATE

(C) MODIFY (D) CHANGE

199. Which of the following should be used to find the mean of the salary?

(A) Mean(salary) (B) Avg(salary)

(C) Sum(salary) (D) Count(salary)

200. How can you find rows that do not match some specified condition?

(A) EXISTS (B) Double use of NOT EXISTS

(C) NOT EXISTS (D) None of the mentioned

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ROUGH WORK

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