1. In the downlink direction LTE user equipments supports

(A) 32-QAM
(B) 64-QAM
(C) 16-QAM
(D) 128-QAM
(E) Answer not known

2. The speed of compression in the data compression can be measured in

(A) byte per cycle (BPC)
(B) bits per cycle (bPC)
(C) cycles per byte (CPB)
(D) cycles per bit (CPb)
(E) Answer not known

3. The 802.11b standard uses the 2.4-GHz ISM which is

(A) License free
(B) Licensed
(C) License with restriction
(D) None of the above
(E) Answer not known

4. While creating MMS, the conversion of user message into a text based layout and event description language is termed as

(A) PLMN
(B) SMIL
(C) MIME
(D) WBMP
(E) Answer not known

5. Identify the handover scenario which is not possible in GSM

(A) Intra-cell handover

(B) Inter-cell, intra-BSC handover

(C) Inter-BSC, intra-MSC handover

(D) Intra BSC, inter-MSC handover

(E) Answer not known

6. Identify the correct flow of messages in MTC under GSM

(A) Paging response, immediate assignment, channel request, paging request

(B) Immediate assignment, paging request, channel request, paging response

(C) Paging request, channel request, immediate assignment, paging response

(D) Channel request, paging request, immediate assignment, paging response

(E) Answer not known

7. The first system that uses CDMA approach for air interface is called as ———————— in mobile communication.

(A) UMTS

(B) IS 95 A

(C) GPS

(D) LTE

(E) Answer not known

8. Match the following, CSS length unit identifiers.

(a)	in	1.	centimeter
(b)	cm	2.	millimeter
(c)	mm	3.	pica:12 points
(d)	pc	4.	inch

	(a)	(b)	(c)	(d)
(A)	(4)	(1)	(2)	(3)
(B)	(1)	(2)	(4)	(3)
(C)	(2)	(1)	(3)	(4)
(D)	(4)	(3)	(1)	(2)

(E) Answer not known

9. After the <html> tag is declared, the next tag that should appear in the document is the ———— tag.

(A) <head> (B) <link>

(C) <style> (D) <meta>

(E) Answer not known

10. The ———— language has no predefined tags.

(A) HTML (B) XML

(C) PHP (D) Python

(E) Answer not known

11. ———— element is used to create an unordered list in a web page.

(A) (B)

(C) (D) <uol>

(E) Answer not known

12. The XML uses the features of ———————— language.

(A) SGML
(B) Python
(C) C
(D) Java
(E) Answer not known

13. How the visually impaired persons can understand the image contents displayed in browser?

(A) By specifying 'src' attribute in img element
(B) By including 'alt' attribute with the support of speech synthesizer software
(C) By specifying 'width' and 'height' attribute in src
(D) By specifying void elements in 'img' attribute
(E) Answer not known

14. A socket which uses connectionless service. In this case, individual packets of information are transmitted over a network. This type of socket is referred to as

(A) Data socket
(B) Server socket
(C) Servlet socket
(D) Datagram socket
(E) Answer not known

15. Write the output of the following code.

```
Class OverloadDemo {
        void test ( ) {
            system.out.println("No Parameters");
        }
        void test (int a) {
            system.out.println("a: "+a);
        }
        void test (int a, int b) {
            system.out.println("a and b: " + a + "     " + b);
        }
}
Class overload {
        public static void main (string args[ ]) {
            Overload.Demo ob = new Overload.Demo ( ); {
                ob.test ( ) ;
                ob.test (10) ;
            }
        }
}
```

(A) No parameter

(B) No parameter
a : 10

(C) No parameter
a and b : 10 20

(D) No parameter
a : 10
a and b : 10 20

(E) Answer not known

16. STRIDE is used to categorize the different ———————— types.

(A) Auditing
(B) Attacks
(C) Vulnerabilities
(D) Threat
(E) Answer not known

17. JSP stands for

(A) Java Static Page
(B) Joint Server Page
(C) Java Servlet Page
(D) Java Server Page
(E) Answer not known

18. The "types" element defines data types that can be used as the types of

(A) Input parameters
(B) Return values
(C) Input and return values
(D) Null values
(E) Answer not known

19. Web services and SOAP are

(A) language dependent and platform independent
(B) language independent and platform dependent
(C) language and platform dependent
(D) language and platform independent
(E) Answer not known

20. The ———————— attribute of webservices specifies the context path for the webservice.

(A) jaxrpc
(B) urlpattern base
(C) WEB-INF
(D) endpoint
(E) Answer not known

21. Most of the cloud architecture are built on this ———————— type of architecture.

(A) Skeleton
(B) Linear
(C) Grid
(D) Template
(E) Answer not known

22. PAYG cloud computing

(A) increases hardware costs
(B) decreases data accessibility
(C) reduces network connectivity
(D) improves scalability
(E) Answer not known

23. ———————— model defines a business model where a large company will rent space on their storage to a small company or an individual who lack the budget for it on their own.

(A) Software as a service
(B) Database as a service
(C) Network as a service
(D) Storage as a service
(E) Answer not known

24. End user connect to the server through a computer terminal which is called as

(A) a client or workstation

(B) a server

(C) agent

(D) service provider

(E) Answer not known

25. In the ————————, an organization can store its important applications and data with in the firewall and can host less important ones on a public cloud.

(A) Hybrid cloud

(B) Community cloud

(C) Public cloud

(D) Private cloud

(E) Answer not known

26. Input sentence is converted into a hierarchical structure that corresponds to the units of meaning in the sentence is

(A) semantic processing

(B) stimming

(C) syntatic processing

(D) lexical

(E) Answer not known

27. The technique which allows a planner to build new operators that represent commonly used sequence of operators is

(A) Triangle table

(B) Meta planning

(C) Macro operators

(D) Case operators

(E) Answer not known

28. The learning method that based on natural adaptation and evolution is

(A) Inductive learning
(B) Genetic algorithm
(C) Analogical learning
(D) Intelligent algorithm
(E) Answer not known

29. The phenomenon called combinatorial explosion exist in

(A) Traveling salesman problem
(B) Tower of Hanoi
(C) 8-puzzle
(D) Water jug
(E) Answer not known

30. The searching technique which requires less memory is

(A) BFS
(B) DFS
(C) Binary
(D) All the above
(E) Answer not known

31. Match the following :

(a)	PostgreSql	1.	Human generated unstructured data
(b)	Scientific data	2.	Open source relational database
(c)	Social media data	3.	Human generated structured data
(d)	Gaming related data	4.	Machine generated unstructured data

	(a)	(b)	(c)	(d)
(A)	2	4	1	3
(B)	3	4	2	1
(C)	2	3	1	4
(D)	1	2	3	4

(E) Answer not known

32. A datawarehouse system which is used to analyze structure data is

(A) MongoDB
(B) SPARK
(C) KAFKA
(D) HiVE
(E) Answer not known

33. ———————— is a single point of failure of Hadoop Cluster. (Per cluster)

(A) Secondary Name Node
(B) Client Node
(C) Data Node
(D) Name Node
(E) Answer not known

34. Match the following storage services in cloud computing :

(a) GFS	1. used for retrieving and storing data from/to remote servers
(b) HDFS	2. very large sustainable reading and writing bandwidth
(c) Amazon S3	3. open source clone of GFS
(d) IaaS	4. Monitor SLAs

	(a)	(b)	(c)	(d)
(A)	3	1	2	4
(B)	2	3	4	1
(C)	4	2	3	1
(D)	2	3	1	4

(E) Answer not known

35. The MapReduce software framework was first proposed and implemented by

(A) Microsoft
(B) Amazon
(C) Google
(D) Azure
(E) Answer not known

36. With sufficient storage any computer platform can be installed in another host computer, even if they use processors with different instruction sets and run with distinct OS on the same hardware, the technology is

(A) file sharing
(B) virtualization
(C) peer computing
(D) file exchange
(E) Answer not known

37. ———— is a software or firmware helps in installing multiple guest OSs (Like Linux/Windows) or VMs on the hardware. It is placed between physical hardware and virtual machine.

(A) Host OS
(B) Guest OS
(C) Virtual machine
(D) Virtual machine monitor
(E) Answer not known

38. ———— involves customizing a standard OS to run various applications which are controlled by different users on a single system at a time.

(A) Agent
(B) Hypervisor
(C) Guest operating systems
(D) Operating system virtualization
(E) Answer not known

39. In this the operating environment will be hosted on a server located in a data centre and accessed by the end-user over LAN or WAN

(A) Server virtualization

(B) Server-hosted desktop virtualization

(C) Storage virtualization

(D) Client-hosted virtualization

(E) Answer not known

40. Main disadvantage of server virtualization

(A) multiple OS technologies deployed on a single hardware platform

(B) restricts the amount of storage space because a single physical computer is partitioned into multiple server which affect disk space

(C) VM allow sandboxing and isolation to restricts attacks

(D) In the field of development, where developers have easy access to OS, and they do not need to install operating system on their desktop

(E) Answer not known

41. Consider the following two statements and choose the correct option.

S1 : A Significant benefit of Bayesian classifiers can classify instances with unknown and null attribute values.

S2 : Decision-tree classifier use a graph and widely used technique for prediction.

(A) S1 is true and S2 is false
(B) S1 is false and S2 is true
(C) Both S1 and S2 are true
(D) Both S1 and S2 are false
(E) Answer not known

42. Another form of dynamic hashing called ———————— hashing.

(A) extended
(B) extensible
(C) extensive
(D) extendable
(E) Answer not known

43. If the relations are already sorted, which join algorithm is more desirable to perform the join computation

(A) Nested loop join
(B) Hash join
(C) Merge join
(D) Cross join
(E) Answer not known

44. Which schema consists of fact table with each dimension of

(A) Dimension schema
(B) Fact constellation
(C) Star schema
(D) Show flake schema
(E) Answer not known

45. Match the following categories of NOSQL systems and their example.

(a)	document based NOSQL	1.	Big Table
(b)	NOSQL key-value stores	2.	Redis
(c)	Column-based NOSQL	3.	Neo4j
(d)	Graph-based NOSQL	4.	MongoDB

	(a)	(b)	(c)	(d)
(A)	(4)	(2)	(3)	(1)
(B)	(4)	(2)	(1)	(3)
(C)	(4)	(1)	(3)	(2)
(D)	(4)	(3)	(2)	(1)

(E) Answer not known

46. How do you ensure the consistency of the database while interaction among multiple transaction simultaneously?

(A) with the help of transaction management component

(B) using query processor

(C) with the help of storage manager

(D) use of concurrency control manager

(E) Answer not known

47. In relational algebra, which operation return rows of the input relation that satisfy the predicate?

(A) Projection

(B) Union

(C) Cartesian product

(D) Selection

(E) Answer not known

48. The capacity to change the schema at one level of a database system without having to change the schema at the next higher level

(A) Data schema
(B) Data independence
(C) Data attributes
(D) External schema
(E) Answer not known

49. Which method is commonly used to convert an ER model to a relational model?

(A) Schema refinement
(B) Relational mapping
(C) Data integration
(D) Query optimization
(E) Answer not known

50. ———— is composite attribute and ———— is the multivalued attributes.

(A) address, dependent_name
(B) dependent_name, address
(C) address, Employee_name
(D) Employee_Name, address
(E) Answer not known

51. A ———— provides a way to describe the design of a database at the physical, logical and view levels.

(A) Data abstraction
(B) Instances
(C) Data model
(D) Schemas
(E) Answer not known

52. Which construct is used to returns the value true if the argument subquery is non empty in the test for empty relations

(A) exists
(B) not exists
(C) > some
(D) > all
(E) Answer not known

53. A relation schema R is in NF with respect to a set of dependencies F (that includes functional dependencies and multivalued dependencies) if, for every nontrivial multivalued dependency $X \rightarrow Y$ in F X is a super key of R

(A) 4NF
(B) 3NF
(C) 2NF
(D) BCNF
(E) Answer not known

54. A database designer uses which process to tune performance of systems to support time-critical operation

(A) Denormalization
(B) Normalization
(C) Non additive join
(D) Dependency preservation
(E) Answer not known

55. If $\alpha \rightarrow \beta$ holds and γ is a set of attributes, then $\gamma\alpha \rightarrow \gamma\beta$ holds. This statement refers to which rule?

(A) Transitivity rule
(B) Reflexivity rule
(C) Union rule
(D) Augmentation rule
(E) Answer not known

56. Several dynamic hashing techniques allow the hash function to be modified dynamically to accommodate the ———————— of the data base.

(A) only growth of DB

(B) only shrinkage of DB

(C) either growth or shrinkage of DB

(D) all the DB

(E) Answer not known

57. What is the purpose of a view in SQL?

(A) To store data physically in the database

(B) To provide a virtual table based on a query

(C) To improve query performance

(D) To ensure data integrity

(E) Answer not known

58.

T3	T4	T6
read (θ)		
	write (θ)	
write (θ)		write (θ)

This schedule is called

(A) Blind write

(B) Blind read

(C) Write assumption

(D) Unconstrained write assumptions

(E) Answer not known

59. ———————— ensures transactions atomicity by recording all database modifications in the log, when the execution of all "write" operations of a transaction until the transaction partially commits.

(A) Deferred update
(B) Immediate update
(C) Recovery update
(D) Intermediate update
(E) Answer not known

60. ———————— two phase locking protocol which requires that all locks be held until the transaction commits.

(A) Implementation of
(B) strict
(C) rigorous
(D) concurrent
(E) Answer not known

61. It is technique for building complex software and systems which focuses on human collaboration and team self organization

(A) Scrum model
(B) Agile model
(C) Adaptive software development
(D) Spiral model
(E) Answer not known

62. The software model can be adapted to apply throughout the entire life cycle of an application from concept development to maintenance

(A) Spiral model
(B) Agile model
(C) Concurrent model
(D) Unified model
(E) Answer not known

63. One of the characteristics of Dynamic System Development Model (DSDM) is

(A) focuses on detailed upfront planning
(B) allows for changes during the development process
(C) emphasizes documentation over working software
(D) requires strict adherence to a fixed schedule
(E) Answer not known

64. Cyclometric complexity is equal to

(A) Numbers of edges (B) Numbers of vertices
(C) Number of independent paths (D) None of the above
(E) Answer not known

65. Alpha testing is done at

(A) Developer's end (B) User's end
(C) User's and Developer's end (D) None of the above
(E) Answer not known

66. Which one is not a process of user interface design?

(A) User, task, environment analysis, modelling
(B) Interface design
(C) Knowledgeable, frequent users
(D) Interface validation
(E) Answer not known

67. Filter and pipes are the concept of which architecture style?

(A) data-centered architectured style
(B) data-flow architecture
(C) call and return architecture
(D) layered architecture
(E) Answer not known

68. Which is a testing methodology useful in finding errors associated with region faults?

(A) Orthogonal array testing
(B) Boundary value analysis
(C) Glass-box testing
(D) Equivalence partitioning
(E) Answer not known

69. Which of the following approaches are the part of integration testing?

(A) Top-down approach
(B) Bottom-up approach
(C) Big-bang approach
(D) All of the above
(E) Answer not known

70. Which one of the following is correct about closed interviews?

(A) There is a pre-defined set of questions
(B) There is no pre-defined agenda
(C) Both (A) and (B) are correct
(D) Both (A) and (B) are wrong
(E) Answer not known

71. Which one of the following is correct about use case diagram?

(A) Interaction between the system and its actors
(B) Interaction between design and testing
(C) Interactions between coding and debugging
(D) All of the above
(E) Answer not known

72. Requirements elicitation is said to be difficult task because of

(A) problems of scope
(B) problems of volatility
(C) problems of understanding
(D) all of the above
(E) Answer not known

73. Which one of the following is a functional requirement?

(A) reliability
(B) robustness
(C) portability
(D) none of the above
(E) Answer not known

74. Arrange the given sequence to form software requirements document

(i) system architecture
(ii) introduction
(iii) index
(iv) appendices
(v) system requirement specification

(A) (i), (ii), (iii), (iv), (v)
(B) (ii), (v), (iv), (i), (iii)
(C) (ii), (i), (v), (iv), (iii)
(D) (iii), (i), (ii), (v), (iv)
(E) Answer not known

75. In Boehm's terminology, the three levels of product complexity are

(A) organic, semidetached and embedded programs
(B) detached, semidetached and fully detached programs
(C) organic, detached, and embedded programs
(D) organic, detached, and semidetached programs
(E) Answer not known

76. A schedule that has been defined at a degree of resolution that allows progress to be monitored and the project to be controlled, is called

(A) project tracking
(B) project scheduling
(C) project network
(D) project monitoring
(E) Answer not known

77. Boehm observes that ———————— is a reasonably accurate estimator of personnel requirements, for the development cycle from architectural design through implementation and system testing.

(A) Rousoult curve
(B) SDLC curve
(C) Rayleigh curve
(D) Software development curve
(E) Answer not known

78. "Updating documentation and making the software more maintainable" in a software maintenance is referred to as,

(A) Corrective maintenance
(B) Adaptive maintenance
(C) Perfective maintenance
(D) Preventive maintenance
(E) Answer not known

79. The discipline of changing existing software-based information systems to diminish undesired characteristics while strengthening desired characteristics is called as

(A) Software Re engineering
(B) Software Engineering
(C) Software Refining
(D) Software design and analysis
(E) Answer not known

80. An estimation model is derived using regression analysis on data collected from past software projects. The overall structure of such model takes the form

(A) $E = A + B * (ev)^c$

(B) $E = AB * (ev)^c$

(C) $E = A * B + (ev)^c$

(D) $E = A^B * (ev)^c$

(E) Answer not known

81. What is the time complexity of inserting an element into a heap?

(A) O (1)

(B) O (log n)

(C) O (n)

(D) O (n log n)

(E) Answer not known

82. What is the time complexity of DFS when the graph is represented using adjacency lists?

(A) $O(|V| + |E|)$

(B) $O(|V|^2)$

(C) $O(|E|^2)$

(D) $O(|VE|)$

(E) Answer not known

83. Maximum number of edges in a n node undirected graph is

(A) $n(n-1)/2$

(B) $n+1$

(C) $n^2 \log n$

(D) n^2

(E) Answer not known

84. Give the worst case complexities of insertion and deletion of a key in a binary search tree?

(A) O(log n) for both insertion and deletion

(B) O(n) for both insertion and deletion

(C) O(n) for insertion and O(log n) for deletion

(D) O(log n) for insertion and O(n) for deletion

(E) Answer not known

85. In AVL tree, the insertion occurs on the "outside" is fixed by a ———— of the tree.

(A) Single rotation

(B) Double rotation

(C) Multi rotation

(D) Mixed rotation

(E) Answer not known

86. Which one of the following is the goal of vertex cover problem?

(A) To cover all edges in a graph using the minimum number of vertices

(B) To cover all vertices in a graph using the minimum number of edges

(C) To find the shortest path between two vertices

(D) To find the maximum independent set

(E) Answer not known

87. Which of the following algorithms are used to find the shortest path from a single source node to all other nodes in a weighted graph?

(A) Warshall's Algorithm

(B) Prims Algorithm

(C) Dijkstra's Algorithm

(D) Kruskal's Algorithm

(E) Answer not known

88. Which of the following is the approximation ratio of an algorithm?

(A) The ratio of the running time to the input size

(B) The ratio of the cost of the approximation solution to the cost of the optimal solution

(C) The ratio of the number of variables to the number of constants

(D) The ratio of the input size to the output size

(E) Answer not known

89. Which of the following is the worst case running time of Rabin-Karp Algorithm?

(A) Theta (n)

(B) Theta (n–m)

(C) Theta ((n–m+1) m)

(D) Theta (n log m)

(E) Answer not known

90. Which of the following is an example of an NP complete problem?

(A) Finding the shortest path in a graph

(B) Sorting a list of integers

(C) Binary search

(D) Hamiltonian circuit problem

(E) Answer not known

91. Which of the following is true for NP in computational complexity theory?

(A) Non-polynomial

(B) Non-deterministic polynomial time

(C) Not polynomial

(D) Non-physical

(E) Answer not known

92. In heap sort, remove operation is basically a swap operation between

(A) any two element

(B) the root and first element

(C) the root and middle element

(D) the root and the last element

(E) Answer not known

93. The best case efficiency of quick sort is

(A) $O(n^2)$

(B) O (n log n)

(C) O $(2n^2)$

(D) None of the above

(E) Answer not known

94. Consider the following recurrence relation $t(n) = 9t(n/3) + 4n^6$, $n \geq 3$ and n is power of 3. Which one of the following options is correct?

(A) $t(n) = \Theta(n^2)$ (B) $t(n) = \Theta(n^3)$

(C) $t(n) = \Theta(n^6)$ (D) $t(n) = \Theta(n^9)$

(E) Answer not known

95. Which sorting algorithm is performs well for small size lists?

(A) Quick sort (B) Shell sort

(C) Insertion sort (D) Merge sort

(E) Answer not known

96. The following algorithm is NOT a divide and conquer algorithm by nature

(A) Heap sort (B) Quick sort

(C) Merge sort (D) AVL tree

(E) Answer not known

97. ———————— searching technique is most suitable for large database.

(A) Binary (B) Hashing

(C) Linear (D) Bubble

(E) Answer not known

98. What is the worst case time complexity of binary search?

(A) O (n)
(B) O (log n)
(C) $O(n^2)$
(D) O (1)
(E) Answer not known

99. In a stack, what is the time complexity of the pop operation?

(A) O (1)
(B) O (n)
(C) O (log n)
(D) O(n^ 2)
(E) Answer not known

100. Which of the following is the process of visiting the various elements of a data structure?

(A) Sorting
(B) Merging
(C) Inserting
(D) Traversal
(E) Answer not known

101. The purpose of the inclusion of cookie in server's response is _____

(A) To acknowledge the server response
(B) To give the requested data
(C) To remember the server site
(D) To reduce the memory space
(E) Answer not known

102. Why does TCP need buffer storage?

(A) To store the connection establishment details

(B) Sending and receiving processes may not at the same speed

(C) To do error detection

(D) To store the echos

(E) Answer not known

103. In which field is present on both UDP Header format and TCP Header format?

(A) Checksum

(B) Sequence number

(C) Acknowledgement number

(D) Window size

(E) Answer not known

104. How does Address Resolution Protocol (ARP) make Internet Protocol (IP) more responsive?

(A) By adding more logical addresses

(B) By mapping between physical and logical addresses

(C) By adding more physical addresses

(D) By increasing the length of the address

(E) Answer not known

105. In fixed-size framing, there is no need for defining the boundaries of the frames. Why?

(A) The whole message will be accomodated in one frame

(B) The destination is defined

(C) The size itself can be used as a delimiter

(D) The system can find the boundaries

(E) Answer not known

106. The ARP query packets includes

(A) Physical and IP addresses of the sender and IP address of the receiver

(B) Physical and IP addresses of the sender

(C) Physical and IP addresses of the sender and physical address of the receiver

(D) Physical and logical addresses of the receiver

(E) Answer not known

107. In two statements choose the correct option

S1: In the datagram approach, the forwarding decision is based on the source address of the packet.

S2: In the virtual – circuit approach, the forwarding decision is based on the label of the packet.

(A) S1 is true, S2 is true

(B) S1 is false S2 is true

(C) S1 is true S2 is false

(D) S1 is false S2 is false

(E) Answer not known

108. Let us assume that $k = 2$ and $n = 3$. Calculate the code words of the following data words.

1.00

2.01

(A) 000,011
(B) 000,010
(C) 001,011
(D) 001,010
(E) Answer not known

109. How could the Two-Node loop instability problem be overcome in Distance Vector routing?

(A) By updating the routing tables
(B) By replace the distance with infinity
(C) By connecting all nodes in the network
(D) By reducing the distance between the nodes
(E) Answer not known

110. Find the class of the following address

00000001 00001011 00001011 11101111

(A) Class B address
(B) Class A address
(C) Class D address
(D) Class C address
(E) Answer not known

111. Why does the first address in a block of IP address not assigned to any device?

(A) It is used for masking

(B) It is used for special purpose addressing

(C) It is used as multicasting address

(D) It is used as the network address that represents the organization

(E) Answer not known

112. How does the information about the nodes disseminated in the network, when link state routing is used?

(A) By sharing LSPs to the next immediate node

(B) By flooding LSP

(C) By sharing the routing tables to the next immediate node

(D) By flooding the routing tables

(E) Answer not known

113. How could the sender determine, the delivery is direct?

(A) If the sender is directly connected to the destination

(B) If the destination is connected to other networks

(C) If the destination and sender are connected via cloud

(D) If destination network address is matched with other addresses of this network

(E) Answer not known

114. The decision making table a router normally uses for applying this action is some times called the routing table also called

(A) Lookup table
(B) Forwarding table
(C) Static table
(D) All the above
(E) Answer not known

115. The cryptographic technique which is used to verify the integrity and authenticity of a message is

(A) Hash functions
(B) Digital signatures
(C) Symmetric encryption
(D) Asymmetric encryption
(E) Answer not known

116. How does sending host use IPSec in transport mode?

(A) To authenticate/encrypt the payload from Network layer
(B) To authenticate/encrypt the payload from Transport layer
(C) To authenticate/encrypt the message from Application layer
(D) To secure the segments of Data link layer
(E) Answer not known

117. Why did AES replace DES encryption?

(A) DES takes more computation time
(B) DES is efficient in Hardware implementation only
(C) The key length of DES is small
(D) Easily cracked by the Hackers
(E) Answer not known

118. Why a conventional lossless compression method not be used as a hashing function?

(A) When uncompress the compressed message, original can't get

(B) The compressed message is irreversible

(C) The compressed message is reversible

(D) The message should not be compressed

(E) Answer not known

119. Which of the 4 operations are false for each round in the AES Algorithm?

(i) Substitute Bytes

(ii) Shift Columns

(iii) Mix Rows

(iv) Add Round Key

(A) (i) only

(B) (ii), (iii) and (iv)

(C) (ii) and (iii)

(D) Only (iv)

(E) Answer not known

120. The following shows a plaintext and its corresponding cipher text. What is the type of cipher applied?

Plain text : HELLO

Cipher text : KHOOR

(A) Polyalphabetic

(B) Hybrid alphabetic

(C) Monoalphabetic

(D) Stereo alphabetic

(E) Answer not known

121. The process of overlapping of execution of next instruction before completion of execution, current instruction is known as

(A) Prefetching
(B) Pipelining
(C) Super scalar operation
(D) Vector operation
(E) Answer not known

122. Choose the most appropriate answer :

Why branch prediction is used in modern processors?

(A) To minimize the control hazards
(B) To increase clock frequency
(C) To reduce cache latency
(D) To optimize compiler performance
(E) Answer not known

123. Choose the most appropriate answer :

What is the primary function of the control unit in a CPU?

(A) Perform arithmetic operations
(B) Store data
(C) Decode and execute instructions
(D) Manage power consumption
(E) Answer not known

124. Choose the most suited option :

The feature of RISC architecture that is not present in CISC architecture is

(A) Pipelining
(B) Branch prediction
(C) Both pipelining and branch prediction
(D) None of them
(E) Answer not known

125. Choose the most appropriate answer :

Data transfer between a peripheral and memory without the active intervention of a processor is known as

(A) Programmed I/O
(B) Interrupt driven I/O
(C) Memory mapped I/O
(D) Direct memory access
(E) Answer not known

126. Choose the most appropriate answer :

How to solve the problem of identifying the source by forcing the requesting device to identify itself to the processor?

(A) Interrupt Naming
(B) Interrupt Priority
(C) Vectored Interrupt
(D) Non-vectored Interrupt
(E) Answer not known

127. Consider the two instructions

Add R2, R3, #100

Subtract R9, R2, #30

What type of hazard it has and how many cycles the pipeline will stall?

(A) Data hazard, 3
(B) Control hazard, 3
(C) Data hazard, 5
(D) Structural hazard, 3
(E) Answer not known

128. The value of the CPI (Cycles Per Instruction) for a pipelined processor is the sum of

(A) Structural stall and control stalls
(B) Data hazard stall, control stall and ideal pipeline CPI
(C) Data hazard stall, control stall, structural stall and ideal pipeline CPI
(D) Data hazard stall, control stall and structural stall
(E) Answer not known

129. Consider the following two statements for DMA and choose the correct option

S1: Bus grant is a daisy – chained signal, so that multiple requests can be arbitrated, just as with interrupt acknowledgement

S2: Bus request is dropped after every memory read or write, so the another DMA device can access to the bus.

(A) S1 is true and S2 is false
(B) S1 is false and S2 is true
(C) Both S1 and S2 are true
(D) Both S1 and S2 are false
(E) Answer not known

130. Choose the most appropriate answer :

Which type of processor describes a system whose instructions can act on multiple data elements in parallel?

(A) SISD
(B) SIMD
(C) MISD
(D) MIMD
(E) Answer not known

131. Choose the best answer that refers cycle stealing in DMA

(A) The capability of taking control over ALU of CPU to do arithmetic operations
(B) The capability of taking control over cache memory to do data transfer
(C) The capability of taking control over system bus to transfer data/address to and from memory
(D) The capability of taking control over control unit of CPU to transfer control information to and from memory
(E) Answer not known

132. Consider X = 0 initially. CPU A reads X after sometime CPU B reads X. In the next time step CPU A stores '1' into X, at the same time CPU B reads the content of X from cache. What will be the value of X read by B from cache and what will be the memory content of X?

(A) 0, 0
(B) 0, 1
(C) 1, 0
(D) 1, 1
(E) Answer not known

133. Choose the correct order of operator precedence for evaluating Boolean expressions.

(A) AND, OR, Parentheses, NOT
(B) Parentheses, NOT, AND, OR
(C) NOT, OR, AND, Parentheses
(D) OR, NOT, Parentheses, AND
(E) Answer not known

134. The combinational circuit ———— are specified under the Flip-flop input columns.

(A) Inputs
(B) Present states
(C) Outputs
(D) Next states
(E) Answer not known

135. What type of circuit is a flip-flop?

(A) Combinational circuit
(B) Sequential circuit
(C) Both (A) and (B)
(D) None of the above
(E) Answer not known

136. In T Flip-flop, when the state of the Flip-flop has to be complemented, what is the value of T?

(A) T = 0
(B) T = 1
(C) Unchanged
(D) T = –1
(E) Answer not known

137. How to convert JK flip flop into D flip flop?

(A) J = K
(B) J = $\overline{K}$
(C) J = K = 1
(D) J = 0, K = 1
(E) Answer not known

138. What is the bias value for the exponent in single-precision floating-point format?

(A) 127
(B) 1023
(C) 15
(D) 255
(E) Answer not known

139. How many minterms are there in a Boolean Function with three variables?

(A) 4
(B) 8
(C) 6
(D) 2
(E) Answer not known

140. In which IC Digital logic family used in systems requiring low power consumption?

(A) CMOS
(B) I^2L
(C) ECL
(D) TTL
(E) Answer not known

141. Function defined outside the class can be accessed using which of the following operator?

(A) Logical operator
(B) Scope resolution operator
(C) Reference
(D) Arithmetic operator
(E) Answer not known

142. In the ANSI 'C' programming language a fixed size sequenced collection of elements of the same type declared before compile time is called as ————————

(A) Arrays
(B) Lists
(C) Index
(D) Sequence
(E) Answer not known

143. In multilevel inheritance, the middle class act as

(A) Base class as well as derived class
(B) Only base class
(C) Only derived class
(D) Public class
(E) Answer not known

144. Objects are the basic ———————— in an object – oriented system.

(A) Global entities
(B) Run-time entities
(C) Local entities
(D) Undesirable entities
(E) Answer not known

145. Choose the most relevant option :

The purpose of the 'std : : mutex' class in a C++ multi – threading program is for

(A) To provide mutual exclusion capability
(B) To provide waiting threads capability
(C) To manage thread priorities capability
(D) To synchronize thread execution
(E) Answer not known

146. In C++ the function such as open ( ) and close ( ) are defined primarily in which of the following class?

(A) ofstream
(B) fstreambase
(C) ifstream
(D) fstream
(E) Answer not known

147. Find the output of the following code,

```
String S = "HELLO";
for (int C = S.length( ) – 1; C.y = 0; C– –)
    {
        System.out.print (S.charAt (C));
    }
```

(A) HELLO
(B) OLLEH
(C) HELL
(D) OLLE
(E) Answer not known

148. A wildcard type argument is denoted by ———— symbol, which represents an unknown type in generic classes.

(A) : :
(B) :
(C) ^
(D) ?
(E) Answer not known

149. A conceptual programming paradigm where a program is divided into two or more subprograms which can be implemented and run at the same time in parallel is known as

(A) Multithreading
(B) Multitasking
(C) Sub programming
(D) Function overloading
(E) Answer not known

150. In the ANSI 'C' programming language, the union declared without tag name is called as

(A) nameless union
(B) unknown union
(C) void union
(D) anonymous union
(E) Answer not known

151. In the ANSI 'C' programming language, the minimum and maximum storable value range of int data type on a 16-bit machine are

(A) –128 to 127
(B) 32, 768 to –32, 767
(C) 128 to –128
(D) –32, 768 to 32, 767
(E) Answer not known

152. a = a*(n + 1)

The shorthand assignment

Operator for the above expression is

(A) a* = n + 1
(B) *a = n + 1
(C) a = *n+1
(D) a* = * (n + 1)
(E) Answer not known

153. An arithmetic operation involving only real operands is called

(A) Integer arithmetic
(B) Mixed-mode arithmetic
(C) Real arithmetic
(D) Logical arithmetic
(E) Answer not known

154. In a 'C' program choose the best operation to determine the size of operand.

(A) realloc
(B) auto
(C) sizeof
(D) malloc
(E) Answer not known

155. In the ANSI 'C' programming language a, convenient abstraction or programmatic construct for handling a group of logically related data items is called as

(A) Arrays
(B) Structures
(C) Lists
(D) Index
(E) Answer not known

156. Consider a 'C' program having variables declared with storage class 'register'. Where these variables are most likely to be stored during execution of the program? Choose the most appropriate answer

(A) Central power unit
(B) Central processing unit
(C) Random access memory
(D) Cache memory
(E) Answer not known

157. Choose the most appropriate word to complete the following statement :

The ———— storage class stores the value into the memory with garbage default value and the scope is local to the block in which the variable is defined.

(A) Automatic
(B) Register
(C) Static
(D) External
(E) Answer not known

158. Choose the best option :

In a 'C' program, A block of memory may be allocated using the following function.

(A) free
(B) malloc
(C) realloc
(D) delete
(E) Answer not known

159. What is the sizeof void pointer in a 32 bit computer system?

(A) 2 bytes
(B) 0 bytes
(C) 4 bytes
(D) 1 byte
(E) Answer not known

160. In a 'C' program what is the purpose of prefixing "&" operator before a variable?

(A) Address operation
(B) Logical operation
(C) Conditional operation
(D) String operation
(E) Answer not known

161. A situation like, where several processes access and manipulate the same data concurrently and the outcome of the execution depends on the particular order in which the access takes place, is known as

(A) Scheduling
(B) Mutex locks
(C) Race condition
(D) Critical section
(E) Answer not known

162. Which of the following latencies affect the performance of real-time systems?

(i) Interrupt Latency
(ii) Propagation Latency
(iii) Dispatch Latency

(A) (iii) only
(B) (ii) and (iii) only
(C) (i) and (iii) only
(D) (i) and (ii) only
(E) Answer not known

163. The preemptive scheduling was introduced first in ———— operating system.

(A) Windows 92
(B) Windows 95
(C) Windows 98
(D) Windows 2000
(E) Answer not known

164. The ———— scheduler, selects from among the processes that are ready to execute, and allocates the CPU to one of them.

(A) Short-term
(B) Long-term
(C) Job
(D) I/O
(E) Answer not known

165. The processes that are residing in main memory and are ready and waiting to execute are kept on a list.

(A) Job queue
(B) Ready queue
(C) Process queue
(D) Device queue
(E) Answer not known

166. The ———— are the I/O port addresses for the DMA controller on PCs.

(A) 000 – 00F
(B) 020 – 021
(C) 040 – 043
(D) 200 – 20F
(E) Answer not known

167. One of the following is a phase of the compiler

(A) Code execution
(B) Code analysis
(C) Code optimization
(D) Code debugging
(E) Answer not known

168. The interface between the source program and the compiler. It reads the source program one character at a time carving the source code into sequence of atomic unit.

(A) Tokenizer
(B) Lexical analyzer
(C) Translator
(D) Syntax analyzer
(E) Answer not known

169. Which of the following algorithm is called as an elevator algorithm?

(i) SSTF
(ii) SCAN
(iii) Look

(A) (i) only
(B) (ii) only
(C) (iii) only
(D) (ii) and (iii) only
(E) Answer not known

170. How the 'Peterson's Algorithm' contribute to mutual exclusion?

(A) By allowing processes to take turns accessing resources
(B) By enforcing a strict order of resource requests
(C) By preemptively reclaiming resources from processes
(D) By dynamically allocating resources based on process priority
(E) Answer not known

171. How does a semaphore differs from a mutex?

(A) Semaphores allow multiple threads to access resource simultaneously, while mutex do not

(B) Mutexes are more efficient than semaphores

(C) Mutexes can have values greater than 1

(D) Semaphores are used for signalling between threads while mutexes are not

(E) Answer not known

172. Suppose multiple processes executes the following section of code will result in

Signal (mutex)

....

Critical section

....

wait (mutex)

(i) Deadlock

(ii) Mutual exclusion is violated

(iii) Several processes may be executing in their critical sections.

(A) (i) only (B) (ii) only

(C) (i) and (iii) (D) (ii) and (iii)

(E) Answer not known

173. Choose the right statements among the following.

(i) Not all unsafe states are deadlocked state.

(ii) Claim edge is introduced in the Banker's algorithm.

(iii) A system is in deadlock state if and only if it contain a cycle in wait for graph.

(iv) An assignment edge in RAG is from Process to Resource ($P \rightarrow R$)

(A) (i) and (ii) are correct
(B) (i) and (iii) are correct
(C) (ii) and (iii) are correct
(D) (iii) only correct
(E) Answer not known

174. An integer variable, apart from initialization when accessed only through two standard atomic operations "wait and signal" is known as

(A) Mutual exclusions
(B) Semaphores
(C) Monitors
(D) Spin lock
(E) Answer not known

175. One of the following is a memory management technique that involves moving entire programs between main memory and disk

(A) Overlays
(B) Swapping
(C) Paging
(D) Segmentation
(E) Answer not known

176. Consider a process is 100 MB in size and the transfer rate to a backing store is 50 MB per second. Find the total context switch time in a swapping system.

(A) 2 seconds
(B) 4 seconds
(C) 1 second
(D) 5 seconds
(E) Answer not known

177. Consider the reference string :

1, 2, 3, 4, 1, 2, 5, 1, 2, 3, 4, 5. Find the number of page faults with 3 frames and 4 frames using FIFO page replacement algorithm.

(A) 8, 10
(B) 10, 9
(C) 10, 8
(D) 9, 10
(E) Answer not known

178. A special small, fast look up hardware cache, associative high speed memory is

(A) Translation look-aside buffer
(B) Page table base register
(C) Random access register
(D) Cache memory
(E) Answer not known

179. On a Linux system, how can the page size of a process can be obtained?

(i) getsize ( ) system call

(ii) getpagesize ( ) system call

(iii) getconf PAGESIZE command

(A) (i) only
(B) (ii) only
(C) (i) and (iii) only
(D) (ii) and (iii) only
(E) Answer not known

180. Which of the following is a page replacement algorithm used in demand paging?

(A) First In First Out (FIFO)
(B) Least Recently Used (LRU)
(C) Round Robin
(D) Shortest Job Next (SJN)
(E) Answer not known

181. Choose most appropriate answer :

For real time operations, fast algorithmic execution within deadline can be achieved through which type processor.

(A) Hardware accelerator processors
(B) Analog processors
(C) General purpose processor
(D) Multi-core processor
(E) Answer not known

182. What are the popular Hardware description languages used in programming Embedded systems?

(A) Verilog and VHDL
(B) C++ and C
(C) Java and C
(D) C++ and Java
(E) Answer not known

183. Choose the most suitable answer :

How is data detected in UART at the receiver end?

(A) COUNTER
(B) TIMER
(C) CLOCK
(D) First Bit
(E) Answer not known

184. ———— refers to the overlapping of execution of a number of tasks related to instruction execution in a RISC processor with other instructions.

(A) Interruption
(B) Pipelining
(C) Instruction loading
(D) Branching prediction
(E) Answer not known

185. The issues faced when a software developed at one kind of hardware platform is embedded at another kind of hardware platform is termed as

(A) Porting Issues
(B) Performance Issues
(C) Latency Issues
(D) Coding Issues
(E) Answer not known

186. For developing embedded systems, a programmer primarily uses a ———— tool for program coding, profiling, testing and debugging of software.

(A) Memory management code
(B) Source code engineering
(C) Analyser code engineering
(D) Integrated code engineering
(E) Answer not known

187. ———— is a popular simulator tool, which provides a virtual target for developing and debugging the real-time embedded software on a personal computer.

(A) Vr Sim
(B) Psr Sim
(C) Vx Sim
(D) Vt Sim
(E) Answer not known

188. A pointer is said to be a ———— pointer if it has not been initialized to null (or) a valid memory address.

(A) Dangling
(B) Null
(C) Integer
(D) Double
(E) Answer not known

189. In C program take the statement : void main (void). What does second void in the above statement indicate?

(A) Main does not return data

(B) Main has no input parameters

(C) Main has null data

(D) Main has return data

(E) Answer not known

190. The function performing the function call is called ———— function and the function being executed is called the ———— function.

(A) Called, calling

(B) Calling, called

(C) Call, calling

(D) Called, call

(E) Answer not known

191. Choose most appropriate answer to complete the sentence :

A ———— is a variable whose values are addresses of memory.

(A) Structure

(B) Bitwise

(C) Pointer

(D) Function

(E) Answer not known

192. Identify the correct code below to capture the switch-pressed event, by waiting for it in an infinite loop. Assume PIN A2 is interfaced to a switch and reads '1' while in 'OPEN' state, and reads '0', while in 'CLOSED' (or depressed) state.

(A) While (input (PIN_A2) == 2));

(B) While (! input (PIN_A2) == 1));

(C) While (! input (PIN_A2));

(D) While (input (PIN_A2) == 1));

(E) Answer not known

193. In storage constrained embedded systems, to save storage and transmission time, what data type can be used when coding?

(A) Bit fields

(B) Structure

(C) Array

(D) Linked list

(E) Answer not known

194. What does ARM thumb procedure call standard specify regarding usage of r15 and r13 registers in code generated by 'C' compilers?

(A) Argument register, General variable register

(B) General variable register, Link register

(C) Link register, Argument register

(D) Program counter, Stack pointer

(E) Answer not known

195. Watchdog timer (WDT) is used to

(A) Detect serious system errors such as frozen or hanging state

(B) Prevent memory overflow

(C) Remove latency in processing

(D) Find out the syntax error in embedded programs

(E) Answer not known

196. Consider the following code chunk with a loop construct. Compute the total time for executing loop in a state of the art microprocessor using the scheme or formula :

```
int sum = 0;
for (int j = 0; j < 100; j++)
sum = sum + j
```

Total time = N * 0(1)

(N – no of iterations

0(1) – no of steps per instructions)

(A) 0(400)

(B) 0(300)

(C) 0(100)

(D) 0(200)

(E) Answer not known

197. Individual functions are generally units or sub-units of processors, tasks, or ISRs. State whether it is true or false.

(A) True

(B) False

(C) Neither true nor false

(D) None of the above

(E) Answer not known

198. Find the implementation type for division operation of ARM, which always has substraction AND slower on ARM processor.

(A) Restoring trial substraction

(B) Convergence substraction

(C) Non restoring trial substraction

(D) 32 bit trail subtraction

(E) Answer not known

199. Find the solution for handling unaligned data in ARM processor if the performance is an issue from the following options.

(A) Access unaligned data using multiple byte loads and stores

(B) Use configured endianness of the memory system

(C) Use multiple routines with a different routine optimized for each possible array alignment

(D) Use big endian format for alignment

(E) Answer not known

200. Identify the set of flags that does not updated in the ARM cpsr register by default.

(A) PC, SP, N, Z flags

(B) N, Z, C, V flags

(C) C, V, PC, SP flags

(D) N, Z, PC flags

(E) Answer not known

———————