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T.B.C. : HNPR-B-CSG

Test Booklet Series

Serial No.
0004497

TEST BOOKLET

COMPUTER SCIENCE AND ENGINEERING

A

Time Allowed : Two Hours

Maximum Marks : 300

INSTRUCTIONS

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9. Sheets for rough work are appended in the Test Booklet at the end.
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    (i) There are four alternatives for the answer to every question. For each question for which a wrong answer has been given by the candidate, **one-third** of the marks assigned to that question will be deducted as penalty.
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1. What is the smallest value of n such that an algorithm whose running time is $50n^2$ runs faster than an algorithm whose running time is 5^n on the same machine ?

   (a) 5

   (b) 10

   (c) 15

   (d) 20

2. Which one of the following is the worst-case time complexity of merge sort ?

   (a) $\Theta(n^2)$

   (b) $\Theta(\log n)$

   (c) $\Theta(n \log n)$

   (d) $\Theta(n)$

3. Which one of the following is the running time complexity of Strassen's matrix multiplication method ?

   (a) $\Theta(n^2)$

   (b) $\Theta(n^{\lg 7})$

   (c) $\Theta(n^{\lg 3})$

   (d) $\Theta(n^3)$

4. Which one of the following statements is NOT relevant to the heap property ?

   (a) In a max-heap, every parent node has a value greater than or equal to its children

   (b) In a min-heap, every parent node has a value less than or equal to its children

   (c) A heap can be k-ary tree instead of binary

   (d) A heap must always be a binary search tree

5. Which one of the following statements is correct regarding Dijkstra's algorithm ?

   (a) Dijkstra's algorithm works for graphs with negative-weight edges

   (b) Bellman-Ford is faster than Dijkstra's algorithm

   (c) Dijkstra's algorithm requires $w(u, v) \geq 0$ for each edge

   (d) Both Dijkstra and Bellman-Ford require non-negative weights

6. What is the memory required by the adjacency-list representation of a graph ?

   (a) $\Theta(|V|)$

   (b) $\Theta(|E|)$

   (c) $\Theta(|V| + |E|)$

   (d) $\Theta(|V| \cdot |E|)$

7. Which one of the following is the running time complexity of Prim's algorithm when implemented using an adjacency list and a binary min-heap ?

(a) $\Theta(V^2)$

(b) $\Theta(E \log V)$

(c) $\Theta(E + V^2)$

(d) $\Theta(V \log V)$

8. Which one of the following layers is NOT available in the TCP/IP reference model compared to OSI reference model ?

(a) Physical, Session and Presentation

(b) Application, Network and Data link

(c) Network, Data link and Presentation

(d) Transport, Network and Data link

9. Six routers are to be connected in a point-to-point subnet. Between each pair of routers, the designers may put a high-speed line, a medium-speed line, a low-speed line or no line. If it takes 200 ms of computer time to generate and inspect each topology, how long will it take to inspect all of them ?

(a) 214·7 million sec

(b) 110·578 million sec

(c) 241·8 million sec

(d) 108·578 million sec

10. A large population of ALOHA users manages to generate 40 requests/sec, including both originals and retransmissions. Time is slotted in units of 30 msec. What is the expected number of transmission attempts needed ?

(a) 5·4

(b) 3·3

(c) 7·4

(d) 2·4

11. Suppose that an 11-Mbps 802.11b LAN is transmitting 32-byte frames back-to-back over a radio channel with a bit error rate of 10^{-3}. How many frames per second will be damaged on average ?

(a) 5000 frames/sec

(b) 9700 frames/sec

(c) 7900 frames/sec

(d) 6900 frames/sec

12. Which one of the following statements is an advantage of a bus topology ?

(a) Each node requires a dedicated connection to a central hub

(b) Redundant cabling is needed for every node

(c) Backbone cable can be laid along the most efficient path

(d) Network installation is very complex

13. Which one of the following type of signals is commonly used in data communications ?

(a) Nonperiodic analog signal

(b) Periodic digital signal

(c) Periodic analog signal

(d) Nonperiodic digital signal

14. Assume we need to download 2 KB text documents at the rate of 100 pages per minute. What is the required bit rate of the channel ?

(a) 27·3 kbps

(b) 25·3 kbps

(c) 23·3 kbps

(d) 21·3 kbps

15. Which one of the following is the standard measure of efficiency for Polynomial ?

(a) O(log n)

(b) O(n(log$n$))

(c) O(n^2)

(d) O(n^k)

16. Which one of the following data structures is the restrictive data structure ?

(a) Stack

(b) Queue

(c) Dequeue

(d) Tree

17. Which one of the following data structures is used in structured programming for the implementation of data hiding ?

(a) Array

(b) Linked list

(c) Full queue

(d) Tree

18. If the number of nodes in a binary tree is N, what is the minimum height of the tree (H_{min}) ?

(a) $[\log_2 N] + 1$

(b) $[\log_2 N]$

(c) $2^N - 1$

(d) $N + 1$

19. Which one of the following statements is the property of an AVL tree ?

(a) Every node has at most two children or more

(b) All items in the right subtree are greater than or equal to the root

(c) The heights of the left and right subtrees of any node differ by at most 1

(d) Each node contains a parent pointer

20. Which one of the following trees is pruned to reduce its size by eliminating unnecessary branches ?

(a) Lexical m-ary tree

(b) B*tree

(c) 2-3 tree

(d) B-tree

21. Which one of the following linked lists does NOT store NULL in next field ?

(a) Singly linked list

(b) Circular linked list

(c) Doubly linked list

(d) Multi linked list

22. Which one of the following searching algorithms is used to solve the infinite-path problem ?

(a) Breadth-First Search

(b) Depth-Limited Search

(c) Depth-First Search

(d) Uniform-Cost Search

23. Which one of the following algorithms has a similar working principle to the AND/OR search algorithm ?

(a) Backward-chaining algorithm

(b) Forward-chaining algorithm

(c) Alpha-beta pruning algorithm

(d) A* Search algorithm

24. Which one of the following statements is correct about exact inference in polytrees ?

(a) Exact inference in polytrees takes exponential time in the size of the network

(b) Exact inference in polytrees takes time linear in the size of the network

(c) Exact inference in polytrees is intractable due to its complexity

(d) Exact inference in polytrees is only feasible in networks with cycles

25. Which one of the following characteristics of systems make them suitable for the application of the Kalman filter ?

(a) Systems with discrete state variables and noisy measurements

(b) Systems with continuous state variables and noisy measurements

(c) Systems with static measurements and no noise

(d) Systems with continuous measurements but no noise

26. Which one of the following statements is correct regarding Relevance-Based Learning (RBL) ?

(a) It derives general rules from examples through explanation and generalization, using a deductive method to convert first-principles knowledge into specialized expertise

(b) It finds inductive hypotheses that explain sets of observations with the help of background knowledge

(c) It uses prior knowledge to identify relevant attributes, reducing the hypothesis space and accelerating learning

(d) RBL techniques perform Knowledge Based Inductive Learning (KBIL) on knowledge in first-order logic, learning relational knowledge beyond the capabilities of attribute-based systems

27. Which one of the following learning methods selects the most likely hypothesis based on data, uses a prior and offers greater tractability ?

(a) Decision tree Learning method

(b) Maximum Likelihood Estimation method

(c) Maximum A Posteriori Estimation method

(d) Naive Bayes Classifier method

28. Which one of the following algorithms is NOT commonly used for text classification ?

(a) Naive Bayes n-gram models

(b) Support Vector Machines

(c) K-means clustering

(d) Logistic Regression

29. Which one of the following statements is correct about forked processes ?

(a) The child process shares the entire memory of the parent

(b) The child process has its own copies of stack and heap, but can share shared memory segments

(c) Only the stack is shared between parent and child

(d) No memory is shared between parent and child

30. Kernel threads are generally more expensive to maintain than user threads because

(a) They need to be associated with a process

(b) They are represented with a kernel data structure

(c) They are unknown to the kernel

(d) They share stack and heap with other threads

31. Which one of the following statements is correct regarding critical-section problem ?

(a) Mutual exclusion, progress and bounded waiting are optional for critical-section solutions

(b) Only mutual exclusion is needed; progress and bounded waiting are unnecessary

(c) Progress ensures that multiple processes can execute in their critical sections simultaneously

(d) A correct critical-section solution must satisfy mutual exclusion, progress and bounded waiting

32. Which one of the following deadlock-avoidance algorithms can handle systems with multiple instances of each resource type ?

(a) Resource-allocation-graph algorithm

(b) Banker's algorithm

(c) First-Come-First-Served algorithm

(d) Round Robin algorithm

33. Which one of the following is a disadvantage of using dynamic tables in operating system ?

(a) They cannot grow beyond a fixed size

(b) They make kernel structures and code more complex

(c) They use fewer system resources

(d) They eliminate potential bugs

34. Which one of the following structures is used in virtual file system to uniquely represent a file across a network ?

(a) inode

(b) datanode

(c) vnode

(d) filenode

35. When three different keys are used in Triple DES, what is the effective key length ?

(a) 56 bits

(b) 64 bits

(c) 112 bits

(d) 168 bits

36. Which one of the following statements is correct to describe the relationship between logical and physical schemas ?

(a) Logical schema is hidden beneath the physical schema

(b) Physical schema cannot be changed once defined

(c) Physical schema is hidden beneath the logical schema

(d) Logical schema depends directly on the physical schema

37. Consider the following SQL query :

```
select p.a1
from p, r1, r2
where p.a1 = r1.a1 or p.a1 = r2.a1
```

Which one of the following conditions is necessary for the query to produce a non-empty output ?

(a) p is empty but r1 and r2 are non-empty

(b) r1 is empty but p and r2 are non-empty

(c) r2 is empty but p and r1 are non-empty

(d) p, r1, and r2 must all be non-empty

38. Which one of the following is NOT a valid mapping cardinality for binary relationship sets ?

(a) One-to-one

(b) One-to-many

(c) Many-to-one

(d) Many-to-zero

39. The 3NF algorithm ensures that the decomposition is a lossless decomposition by

(a) ensuring all relations are BCNF

(b) decomposing until no attributes remain same

(c) merging relations after decomposition

(d) guaranteeing that at least one relation contains a candidate key of the original schema being decomposed

40. In the BCNF decomposition algorithm, a relation schema r(a, b, g) is decomposed using the functional dependency $a \rightarrow b$ into $r_1(a, b)$ and $r_2(a, g)$. Which of the following primary-key and foreign-key constraints would you expect to hold on the decomposed relations ?

(a) Primary key : a in r_1; Foreign key : b in r_2 referencing r_1

(b) Primary key : b in r_1; Foreign key : a in r_1 referencing r_2

(c) Primary key : a in r_1; Foreign key : a in r_2 referencing r_1

(d) Primary key : g in r_2; Foreign key : b in r_1 referencing r_2

41. Which one of the following transaction properties ensures that either all operations of a transaction occur or none of them do ?

(a) Consistency

(b) Durability

(c) Isolation

(d) Atomicity

42. Which one of the following statements is correct regarding the rigorous two-phase locking (2PL) protocol ?

(a) The rigorous two-phase locking (2PL) protocol releases locks as soon as possible

(b) The rigorous two-phase locking (2PL) protocol releases all locks only at the end of the transaction

(c) The rigorous two-phase locking (2PL) protocol does not require locking at the end of the transaction

(d) The rigorous two-phase locking (2PL) protocol uses graph-based methods

43. In a brute-force attack, how many keys must typically be tested for success ?

(a) All possible keys

(b) One-fourth of the possible keys

(c) Only a few keys

(d) On average, half of all possible keys

44. How long does it take to exhaustively search a 32-bit key at a speed of 1 decryption per microsecond ?

(a) 2·15 seconds

(b) 35·8 minutes

(c) 10·01 hours

(d) 1142 years

45. Which one of the following cryptographic concepts ensures that each ciphertext digit is influenced by many plaintext digits ?

(a) Compression

(b) Confusion

(c) Diffusion

(d) Transposition

46. What is a key characteristic of a passive security attack according to X.800 and RFC 2828 ?

(a) It alters system resources

(b) It attempts to learn or use information without affecting system resources

(c) It affects system operation directly

(d) It physically damages the system

47. Which one of the following is an example of a hash function used for deskewing a True Random Number Generator (TRNG) output ?

(a) AES

(b) MD5

(c) RSA

(d) DES

48. In a public key system using RSA (Rivest-Shamir-Adleman), ciphertext $C = 10$ is sent to a user whose public key is $(e, n) = (5,35)$. What is the original plaintext (M) ?

(a) 2

(b) 5

(c) 10

(d) 15

49. A router can process 3 million packets/sec. The load offered to it is 2 million packets/sec on average. If a route from source to destination contains 8 routers, how much time is spent being queued and serviced by the router ?

(a) 20 µsec

(b) 30 µsec

(c) 8 µsec

(d) 10 µsec

50. A benchmark program is executed on a 40 MHz processor. The program consists of 10,000 instructions with the following instruction mix and clock cycle count :

Instruction Type	*Instruction Count*	*Cycles per Instruction (CPI)*
Integer arithmetic	5,000	1
Data Transfer	2,000	2
Floating point	5,000	4
Control transfer	2,000	3

What is the CPU execution time for the program ?

(a) 0·75 ms

(b) 0·6 ms

(c) 0·875 ms

(d) 1·0 ms

51. Which one of the following type of interrupts is caused by events such as arithmetic overflow, division by zero, or illegal instruction execution ?

(a) Timer interrupt

(b) I/O interrupt

(c) Program interrupt

(d) Hardware failure interrupt

52. The principal disadvantage of associative mapping is

(a) poor hit ratio

(b) limited block placement

(c) the complex circuitry required to examine the tags of all cache lines in parallel

(d) worked for small caches only

53. Which one of the following statements is correct regarding the traditional Dynamic Random Access Memory (DRAM) during the access-time delay ?

(a) The processor can perform other tasks while waiting

(b) DRAM performs various internal functions like sensing and routing data, while the processor must wait

(c) The memory responds immediately without delay

(d) The data is automatically synchronized with the system clock

54. What is the total swap time, if the system has an average latency of 10 ms, the user process is 60 MB in size, and backing store is a standard hard disk with transfer rate of 15 Mbps ?

(a) 4·01 s

(b) 8·20 s

(c) 8·10 s

(d) 8·02 s

55. If a system is having frame size of 8 KB, then a system with 4 byte entries can address

(a) 32 TB physical memory

(b) 16 TB physical memory

(c) 8 TB physical memory

(d) 4 TB physical memory

56. Consider a system with an average page-fault service time of 4 ms and a memory access time of 150 ns, the page fault probability is 0·2, what is the effective access time of the system ?

(a) 800120 ns

(b) 400060 ns

(c) 3200120 ns

(d) 1600060 ns

57. In Graph Theory, the properties of an electrical network are functions of the following factors :

1. The nature and value of the elements forming the network, such as resistors, inductors, transistors, and so forth.

2. The way these elements are connected together, that is, the topology of the network.

Which of the above factors is/are correct ?

(a) Both 1 and 2

(b) Neither 1 nor 2

(c) 1 only

(d) 2 only

58. A connected planar graph with n vertices and e edges has

(a) $(e - n + 1)$ regions

(b) $(e - n + 2)$ regions

(c) $(e - n)$ regions

(d) $(e - n - 1)$ regions

59. If A(G) is an incidence matrix of a connected graph G with n vertices, then what is the rank of A(G) ?

(a) n

(b) $n + 1$

(c) $n - 1$

(d) $(n + 1)/2$

60. Which one of the following terms is frequently used in C++ to describe code inserted into a program to help for debugging ?

(a) Defensive programming

(b) Static analyzer

(c) Snapshots

(d) Scaffolding

61. Which one of the following type of data structures is used in a computer system where there may be tasks waiting for the printer, for access to disk storage, or even, with multi-tasking, for use of the CPU ?

(a) Stacks

(b) Queues

(c) Linked lists

(d) Hash tables

62. Which one of the following features in C++ has the ability of a derived class to reuse the members of a base class ?

(a) Inheritance

(b) Dynamic Binding

(c) Encapsulation

(d) Objects

63. Which one of the following types of objects are created during program execution and they are not assigned names while it is being written ?

(a) Automatic objects

(b) Dynamic objects

(c) Aliases objects

(d) Static objects

64. Consider the following statements regarding design of C++ :

1. C++ was developed from the C programming language
2. The try-block statement of C++ needs no run-time support
3. C++ has no built-in high-level data types and no high-level primitive operations.

Which of the above statements is/are NOT correct ?

(a) 2 only

(b) 3 only

(c) 1 and 3

(d) 2 and 3

65. Match the following lists :

List I *(C++ Operator)*	List II *(Symbol)*
P. Member Selection	1. ( )
Q. Complement	2. →
R. Value Construction	3. *
S. Dereference	4. ~

Select the correct answer using the code given below :

Code :

	P	Q	R	S
(a)	1	4	3	2
(b)	1	4	2	3
(c)	2	4	1	3
(d)	3	2	4	1

66. Consider the following statements regarding friend functions in C++ :

1. A friend function can access only the private data variables of another class.
2. A friend function requires objects to be passed as reference or value.
3. In operator overloading, a friend function allows overloading of stream operators for stream computation on user defined data types.

Which of the above statements is/are NOT correct ?

(a) 1 only

(b) 2 only

(c) 1 and 2

(d) 2 and 3

67. Consider the following statements regarding virtual function in C++ :

1. Through virtual functions, function of the base class can be overridden by functions in the derived class.
2. When a pointer to the base class is used with the derived class object, the object to which it points decides the activation of the appropriate member function call.
3. In C++, virtual member functions are linked at the compile time.

Which of the above statements is/are NOT correct ?

(a) 1 only

(b) 2 only

(c) 1 and 3

(d) 2 and 3

68. As per the C++ exception handling mechanism, identify the correct order of performing the following tasks :

1. Receive the error information
2. Detect the problem causing the exception
3. Take the corrective actions
4. Inform that an error has occurred

(a) $1 \rightarrow 4 \rightarrow 2 \rightarrow 3$

(b) $1 \rightarrow 3 \rightarrow 2 \rightarrow 4$

(c) $4 \rightarrow 2 \rightarrow 3 \rightarrow 1$

(d) $2 \rightarrow 4 \rightarrow 1 \rightarrow 3$

69. The C++ compiler implements function overloading, although the functions in the code share the same name in the source text, however the compiler and the linker use different names. The technique which helps in this conversion of source code function name to an internally used name is known as

(a) Name mangling

(b) Name aliasing

(c) Name fusion

(d) Name linking

70. Consider the following statements regarding variables in C++ :

1. Period of time during which the memory is associated with a variable is known as its scope.

2. Region of source code over which the definition of an identifier is visible, is called its extent.

3. The extent of global variables is the life-span of the program.

4. The scope of the variable can confirm to a block, a function, a file or even an entire program.

Which of the above statements is/are NOT correct ?

(a) 1 only

(b) 4 only

(c) 1 and 2

(d) 3 and 4

71. Which one of the following statements is correct regarding Foster's methodology in parallel program design ?

(a) It provides a sequence of steps that can be used to design parallel programs. The steps are partitioning the problem to identify tasks, identifying communication among the tasks, agglomeration or aggregation to group tasks and mapping to assign aggregate tasks to processes/threads

(b) It provides functions for accessing memory belonging to another process and partitioned global address space languages, which provide some shared-memory functionality in distributed-memory systems

(c) It provides a sequence of steps that cannot be used to design parallel programs. The steps are identifying the problem, identifying communication among the tasks, agglomeration or aggregation to group tasks and mapping to assign aggregate tasks to processes/threads

(d) It provides functions for accessing memory belonging to same process and partitioned global address space languages, which provide some shared-memory functionality in cluster-memory systems

72. Which one of the following statements is correct regarding the concurrent computing ?

(a) A program is one in which multiple tasks cooperate closely to solve a problem

(b) A program may need to cooperate with other programs to solve a problem

(c) A program is one in which multiple tasks can be in progress at any instant

(d) A program may need not to cooperate with other programs to solve a problem

73. An M2M or IoT device can NOT be characterized by which of the following properties ?

(a) Microcontroller

(b) Power Source

(c) User Interface

(d) Shape and Dimension

74. Consider the following statements regarding IoT devices :

1. Weak type data is data that is not well structured

2. Weak type data is defined by developers and created in advance

3. Strong type data refers to data stored in traditional database formats

4. Strong type data often have the analysis defined beforehand

Which of the above statements is/are NOT correct ?

(a) 1 only

(b) 2 only

(c) 2 and 4

(d) 1 and 3

75. Which of the following expressions is correct regarding the general frame-work for IoT using the cloud based services ?

(a) Gather + Enrich + Stream + Manage + Acquire + Organise and Analyse = Internet of Things

(b) Gather + Consolidate + Connect + Collect + Assemble + Manage and Analyse = Internet of Things

(c) Physical Object + Controller, Sensor and Actuators + Internet = Internet of Things

(d) Gather + Stream + Manage + Organise and Analyse + Internet = Internet of Things

76. The Machine-to-Machine (M2M) architecture consists of which of the following domains ?

(a) M2M device domain, M2M network domain, M2M service domain

(b) M2M device domain, M2M network domain, M2M application domain

(c) M2M network domain, M2M service domain, M2M computing domain

(d) M2M device domain, M2M network domain, M2M process domain

77. Which one of the following key technologies is used in Ultra-Wide Band for data transmission ?

(a) Frequency Hopping Spread Spectrum

(b) Orthogonal Frequency Division Multiplexing

(c) Multiband Orthogonal Frequency Division Multiplexing

(d) Time Division Multiple Access

78. Match the following lists regarding IoT protocols :

List I	List II
P. Device layer	1. AMQP
Q. Application protocol	2. RPL
R. Network layer	3. 6LoWPAN
S. Routing protocol	4. IEEE802.15.4

Select the correct answer using the code given below :

	P	Q	R	S
(a)	4	1	3	2
(b)	1	4	3	2
(c)	3	2	4	1
(d)	3	4	2	1

79. Which one of the following RPL messages is used to unicast destination information toward selected parents and maintain upward and downward traffic ?

(a) DODAG Information Object (DIO)

(b) Destination Advertisement Object (DAO)

(c) DODAG Information Solicitation (DIS)

(d) DAO Acknowledgement (DAO-ACk)

80. 6LoWPAN is originally designed to support

(a) DASH7 alliance, provide solutions through MBOA MAC, MBOA physical layer

(b) IEEE 802.15.4 low-power wireless networks in the 2.4 GHz band

(c) DDS, AMQP, HTTP REST for all sub-1 GHz radio devices

(d) LTE-A. IEEE 802.15.4 low power wireless networks in the Z-wave band

81. Which one of the following is a feature of UPnP that makes it suitable for service discovery of IoT device ?

(a) Requires manual IP configuration

(b) Dynamic network joining with automatic IP assignment and capability sharing

(c) Requires D2D bus for integrating intelligent machines

(d) XMPP for connecting devices to people, a special case of the D2S pattern

82. Message Queue Telemetry Transport (MQTT) is specially designed for

(a) resource-unconstrained devices, high bandwidth and high latency networks

(b) resource-constrained devices, low bandwidth and high latency networks

(c) resource-unconstrained devices, low bandwidth and low latency networks

(d) resource-constrained devices, high bandwidth and high latency networks

83. Which one of the following functionalities is used that can function as a relay station, to extend the operating range of another access point, or as a point-to-point wireless bridge between two networks ?

(a) Network storage server

(b) Switching hub

(c) Internet gateway

(d) Wireless bridge

84. Which one of the following statements is NOT correct regarding Lightweight Access Point Protocol ?

(a) It is to reduce the amount of protocol code being executed at the access point so that efficient use can be made of the access point's computing power, by applying this to wireless communication rather than to bridging, forwarding and other functions

(b) It is to use centralized network computing power to execute the bridging, forwarding, authentication, encryption and policy enforcement functions for a wireless LAN

(c) It is to provide several wired Ethernet ports that efficient use can be accessed with switching hub capabilities for a number of Ethernet devices

(d) It is to provide a generic encapsulation and transport mechanism for transporting frames between hub devices and access points, which will enable multi-vendor interoperability and ensure that LWAPP can be applied to other access protocols in the future

85. Which one of the following is the key feature of IEEE 802.11i standard suite ?

(a) High speed WLAN standard, supporting 54 Mbps data rate using OFDM modulation in the 5 GHz ISM band

(b) Addresses the security weaknesses in user authentication and encryption protocols. The standard employs advanced encryption standard (AES) and 802.1x authentication

(c) Increased network security by extending 802.11 protection to management as well as data frames

(d) Enhances data rate to 54 Mbps using OFDM modulation on the 2.4 GHz ISM band and interoperable in the same network with 802.11b equipment

86. Which one of the following pairwise keys is used to ensure confidentiality by encrypting messages in the 4-way and group key handshakes ?

(a) EAPoL key encryption key

(b) Pairwise transient key

(c) Pairwise master key

(d) EAPoL key confirmation key

87. In a Wireless Network, which one of the following type of schemes is used in 802.11 for data transmissions that are sent at the same time with reception ?

(a) CSMA (Carrier Sense Multiple Access)

(b) OFDM (Orthogonal Frequency Division Multiplexing)

(c) OTDM (Orthogonal Time Division Multiplexing)

(d) WiFi Protected Access

88. What is the cutoff frequency used in an ordinary telephone line, if a voice-grade line has been artificially introduced ?

(a) Around 30000 Hz

(b) Above 10000 Hz

(c) Above 4000 Hz

(d) Above 3000 Hz

89. Which one of the following is suggested for detecting position outliers in time-series, spatial and sequential data ?

(a) Prediction-based technique

(b) Clustering algorithm

(c) Data imputation method

(d) Dimensionality reduction method

90. In Big data analytics, prescriptive analytics tools and techniques are applied against

(a) structured historical data only

(b) unstructured text data only

(c) structured and unstructured data sets

(d) real-time streaming data only

91. The k-means type of data operates on which one of the following ?

(a) Objects with categorical attributes only

(b) Objects with measurable attributes

(c) Objects with text attributes

(d) Objects with binary attributes only

92. Which one of the following regression techniques is used to set some coefficients exactly to zero, performing variable selection ?

(a) Ridge regression

(b) Lasso regression

(c) Linear regression

(d) Logistic regression

93. How many copies of each HDFS block are created by default in case of a failure ?

(a) 1

(b) 2

(c) 3

(d) 4

94. Which one of the following models is more suitable for graph processing than MapReduce as per Big data analytics ?

(a) Bulk Synchronous Parallel model

(b) Distributed File System model

(c) Task Tracker model

(d) HDFS replication model

95. Which one of the following is also known as 'short term' memory of an enterprise ?

(a) Operational data store

(b) Data mart

(c) OLTP

(d) Data warehouse

96. Consider the following statements regarding Snowflake schema in Data Warehouse schema :

1. Due to normalization in the Snowflake schema, the redundancy is reduced and therefore, it becomes easy to maintain and save the storage space

2. Due to de-normalization in the Snowflake schema, the redundancy is reduced and therefore, it becomes easy to maintain and save the storage space

3. Due to kurtosis in the Snowflake schema, the redundancy is reduced and therefore, it becomes easy to maintain and save the storage space

Which of the above statements is/are correct ?

(a) 1 only

(b) 2 only

(c) 3 only

(d) 1 and 3

97. Which one of the following statements is correct regarding weakness of Density-Based Spatial Clustering of Applications with Noise (DBSCAN) algorithm ?

(a) The DBSCAN algorithm cannot cluster datasets accurately with varying densities or large differences in densities

(b) It is not required to specify the number of clusters in the data at the start in case of the DBSCAN algorithm

(c) It requires only two parameters and does not depend on the ordering of the points in the database

(d) It can identify clusters of arbitrary shape. It is also able to identify the clusters completely surrounded by a different cluster

98. Which one of the following type of schemes is used by the popular USB (Universal Serial Bus) standard for connecting computer peripherals ?

(a) NRZ (Non-Return-to-Zero)

(b) NRZI (Non-Return-to-Zero Inverted)

(c) ORZI (One-Return-to-Zero Inverted)

(d) ZRO (Zero-Return-to-One)

99. Which one of the following type of mappings is used to map the bits to symbols so that adjacent symbols differ in only 1 bit position ?

(a) Excess-3 code

(b) Binary code

(c) EBCDIC code

(d) Gray code

100. Which one of the following techniques is used in cable networks 802.11, where a high-rate stream of digital information is split into many low-rate streams that are transmitted on the subcarriers in parallel ?

(a) Statistical Time Division Multiplexing

(b) Time Division Multiplexing

(c) Orthogonal frequency Division Multiplexing

(d) Code Division Multiple Access

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