

PART III — 3. COMPUTER SCIENCE & ENGINEERING/INFORMATION TECHNOLOGY

56. Two dice are thrown 120 times. The average number of times in which the number on the first dice exceeds the number on the second dice is
1. 40
 2. 50
 3. 60
 4. 70
57. A random process $X(t)$ is defined by $X(t) = Y \cos(\omega t)$ where ω is constant and Y is uniform in $(0, 1)$. The mean of the process is
1. $\cos(\omega t)$
 2. $\sin(\omega t)$
 3. $\frac{1}{2} \cos(\omega t)$
 4. $\frac{1}{2} \sin(\omega t)$
58. In the Kendall's notation for representing the queueing model given by $(a/b/c):(d/e/f)$, the symbol 'c' represents
1. Interarrival distribution
 2. Service time distribution
 3. Number of parallel servers
 4. Queue discipline
59. The mean lifetime of a sample of 25 bulbs is found to be 1550 hours with a standard deviation of 120 hours. The company manufacturing the bulbs claims that the average life of their bulbs is 1600 hours. To test the claim, the value of the test statistics is
1. 2.04
 2. -2.04
 3. 0.083
 4. -0.083
60. The language generated by the grammar $G = (\{S, A\}, \{a, b\}, P, S)$, where $P = \{S \rightarrow aS, S \rightarrow aA, A \rightarrow bA, A \rightarrow b\}$ is
1. $\{a^n b^n / n \geq 1\}$
 2. $\{a^n b^m / n, m \geq 2\}$
 3. $\{a^m b^n / n, m \geq 0\}$
 4. $\{a^n b^n / n \geq 0\}$
61. The language generated by a two-way finite state automation is
1. context – free language
 2. regular language
 3. context sensitive language
 4. recursive language

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62. If a graph G is k -edge connected, then

1. $|E(G)| < \frac{k|V(G)|}{2}$
2. $|E(G)| \geq \frac{k|V(G)|}{2}$
3. $|E(G)| < \frac{k^2|V(G)|}{2}$
4. $|E(G)| \geq \frac{k^2|V(G)|}{2}$

63. If a graph G is self-complementary with n vertices, then

1. $n \equiv 0 \text{ or } 1 \pmod{4}$
2. $n \equiv 0 \text{ or } 1 \pmod{3}$
3. $n \equiv 0 \text{ or } 3 \pmod{4}$
4. $n \equiv 0 \text{ or } 2 \pmod{3}$

64. A compiler for a high-level language that runs on one machine and produces code for a different machine is called

1. optimizing compiler
2. one pass compiler
3. cross compiler
4. multi-pass compiler

65. A shift reduce parser carries out the actions specified within braces immediately after reducing with the corresponding rule of grammar

$S \rightarrow xxW$ (PRINT "1")

$S \rightarrow y$ {print "2"}

$S \rightarrow Sz$ {print "3"}

What is the translation of xxxxyzz using the syntax directed translation scheme described by the above rules?

1. 23131
2. 11233
3. 11231
4. 33211

66. The most powerful parser is

1. SLR
2. LALR
3. Canonical LR
4. Operator-precedence

67. Peep-hole optimization is a form of

1. loop optimization
2. local optimization
3. constant folding
4. data flow analysis

68. Memory which is dynamically allocated during process run time

1. heap
2. stack
3. queue
4. tree

69. Process is

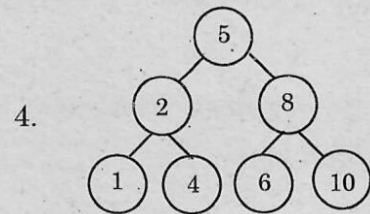
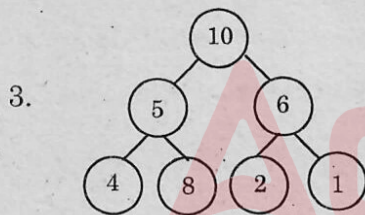
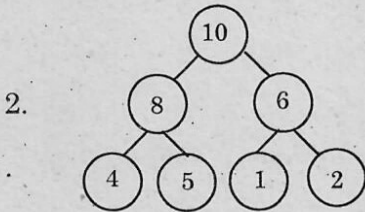
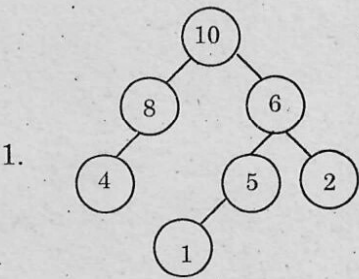
1. Program in high level language
2. Contents of main memory
3. An instance of a program in execution
4. A program in secondary memory

70. A process that has terminated, but whose parent has not yet called wait (), is known

1. Zombie process
2. Process mix
3. CPU-bound process
4. Renderer process

71. The memory allocation scheme subject to external fragmentation is
1. multiple contiguous fixed partitions
 2. swapping
 3. segmentation
 4. pure demand paging
72. Page stealing is
1. sign of an efficient system
 2. used for tuning
 3. taking page frames from other working sets
 4. taking larger disk space for pages
73. Fork is nothing but the.
1. dispatching of a task
 2. increasing priority of a task
 3. creation of a new job
 4. creation of a new process
74. The maximum number of election message needed by a ring algorithm for network size of N nodes is
1. N
 2. $N-1$
 3. $2N-1$
 4. $3N-1$
75. Which of the following is not a property of a transaction?
1. Durability
 2. Isolation
 3. Atomicity
 4. Casacadable
76. Lamport clock synchronization uses
1. wall clock time
 2. logical time
 3. UTC
 4. IST time
77. _____ and _____ are concurrency control mechanisms
1. Atomicity, Durability
 2. Locking, Time stamping
 3. Atomicity, Isolation
 4. Commit, Rollback
78. A priority queue is implemented as a max-heap. Initially, it has 5 elements. The level-order traversal of the heap is given below: 10, 8, 5, 3, 2. Elements 1 and 7 are inserted in the heap and the level – order traversal after insertion is
1. 10, 8, 7, 5, 3, 2, 1
 2. 10, 8, 7, 2, 3, 1, 5
 3. 10, 8, 7, 1, 2, 3, 5
 4. 10, 8, 7, 3, 2, 1, 5
79. Which of the following number of nodes can form a full binary tree?
1. 8
 2. 5
 3. 14
 4. 13

80. A max-heap is a heap where the value of each parent is greater than or equal to the values of its children. Which of the following is a max-heap?



81. A hash table of length 10 uses open addressing with hash function $h(k) = k \bmod 10$, and linear probing. After inserting 6 values into an empty has table, the table is as shown below

0	
1	
2	42
3	23
4	34
5	52
6	46
7	33
8	
9	

Give a possible order in which the key values could have been inserted in the table

1. 46, 42, 34, 52, 23, 33
2. 34, 42, 23, 52, 33, 46
3. 46, 34, 42, 23, 52, 33
4. 42, 46, 33, 23, 34, 52

82. A person wants to visit some places. He starts from a vertex and then wants to visit every vertex till it finishes from one vertex, backtracks and then explore other vertex from same vertex. What algorithm he should use?

1. DFS
2. BFS
3. Prim's algorithm
4. Kruskal's algorithm

83. What is the time complexity of finding the existence of an edge between two particular vertices in an adjacency list representation?
1. $O(V)$
 2. $O(E)$
 3. $O(1)$
 4. $6(V + E)$
84. The following paradigm can be used to find the solution of the problem in minimum time: Given a set of non-negative integer and a value K , determine if there is a subset of the given set with sum equal to K :
1. Divide and Conquer
 2. Dynamic Programming
 3. Greedy Algorithm
 4. Branch and Bound
85. Let X be a problem that belongs to the class NP. Then which one of the following is TRUE?
1. There is no polynomial algorithm for X .
 2. If X can be solved deterministically in polynomial time then $P = NP$
 3. If X is NP-Hard, then it is NP-Complete
 4. X may be undecidable
86. The following design paradigm is not used to design approximation algorithms
1. Greedy
 2. Dynamic Programming
 3. Greedy and Dynamic Programming
 4. Backtracking
87. The minimum number of arithmetic operations required to evaluate the polynomial $P(X) = X^5 + 4X^3 + 6X + 5$ for a given value of X using only one temporary variable is.
1. 6
 2. 7
 3. 8
 4. 9
88. Address bits needed to select all locations in memory of $16 K \times 8$ RAM
1. 8 bits
 2. 10 bits
 3. 14 bits
 4. 16 bits
89. The ALU makes use of _____ to store the intermediate results.
1. Accumulator
 2. Registers
 3. Heap
 4. Stack
90. The vector architecture of processor belongs to the Flynn's taxonomy of
1. SISD
 2. SIMD
 3. MIMD
 4. MISD
91. Loop unrolling is a _____ technique to explore instruction level parallelism.
1. Hardware
 2. Compiler
 3. Interpreter
 4. Processor

92. FFT algorithms exploit
1. Symmetry property
 2. Symmetry and periodicity property
 3. Linearity and periodicity property
 4. Symmetry and linearity property
93. Find DIT FFT for the sequence
 $x(n) = \cos \frac{n\pi}{2}$ where $N = 4$
1. $\{1, 1, 2, 2\}$
 2. $\{1, 0, -1, 0\}$
 3. $\{0, 2, 0, 2\}$
 4. $\{0, 4, 0, 1\}$
94. Use backward difference for the derivative and convert the analog filter with system function $H(s) = \frac{1}{s^2 + 16}$
1. $H(z) = \frac{1}{z^{-2} - 2z^{-1} + 17}$
 2. $H(z) = \frac{1}{z^{-2} - z^{-1} + 16}$
 3. $H(z) = \frac{1}{z^{-2} - 2z^{-1} + 1}$
 4. $H(z) = \frac{1}{z^{-2} - 4z^{-1} + 16}$
95. In Classful addressing the prefix for multicast address is
1. 1110
 2. 0
 3. 10
 4. 1111
96. In TCP connection Nagle's algorithm solves the problem of
1. Window shutdown
 2. Shrinking window
 3. Slow window
 4. Silly window syndrome
97. The Mapping of IP address to MAC address is done by
1. ARP
 2. RARP
 3. DHCP
 4. RSVP
98. TCP is a _____ protocol.
1. Physical layer connection oriented
 2. Network layer connection oriented
 3. Transport layer connectionless
 4. Transport layer connection oriented
99. HTTP is _____ protocol.
1. a transport layer
 2. an applications layer
 3. a network layer
 4. a physical layer
100. The relational data model organizes the database as a
1. Tree structure
 2. Graph
 3. Document object model
 4. Set of relations and relationship among the relations

101. A relation in a relational database can have _____ primary key (s).
1. any number of
 2. a maximum of four
 3. only one
 4. atleast two
102. Second normal form disallows
1. Full functional dependency
 2. Partial functional dependency
 3. Transitive functional dependency
 4. Non-trivial Multivalued dependency
103. Consider a relation $R(A\ B\ C)$. The primary key of the relation is A. The following functional dependencies hold:
 $A \rightarrow B$
 $B \rightarrow C$
 Relation R is not in
1. First normal form
 2. Second normal form
 3. Third normal form
 4. BCNF
104. Horizontal fragmentation is based on _____ operation in relational algebra.
1. Select
 2. Project
 3. Join
 4. Division
105. _____ routines attempt to fill in missing values, smooth out noise while identifying outliers, and correct inconsistencies in the data.
1. Classification
 2. Clustering
 3. Association rule mining
 4. Data cleaning
106. Min-Max normalization is a _____ technique
1. Data cleaning
 2. Data integration
 3. Data transformation
 4. Outlier Mining
107. The COCOMO model is
1. an analysis model
 2. a design model
 3. a cost model
 4. a testing model
108. Software configuration management is used
1. to manage different software systems
 2. to manage changes in the software
 3. to manage interactions between software
 4. to manage setting up software systems
109. An incremental process model
1. increments the process in each cycle
 2. delivers one completed product
 3. delivers an operational product in each increment
 4. increments changes to the model in each cycle
110. The change control process starts with
1. a test case
 2. a design feature
 3. a specification
 4. a change request

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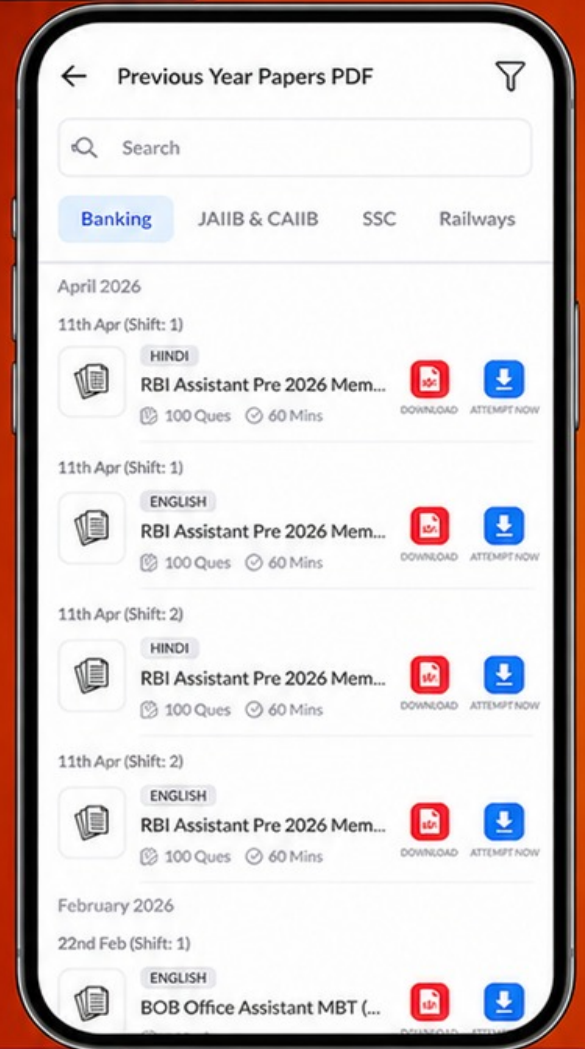
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111. Use cases
1. define the interactions between user and system
 2. brings out cases of usage by the system
 3. defines details of the system behavior
 4. defines interactions between modules
112. Quality metrics on reliability of the software include
1. average time taken to execute a function
 2. mean time between failures
 3. number of words in the documentation
 4. number of lines of code
113. A _____ is used to demonstrate, on a purely syntactic basis, that one formula is a logical consequence of another formula
1. Deductive systems
 2. Inductive systems
 3. Reasoning with knowledge based systems
 4. Search based systems
114. Which is used for utility functions in game playing algorithm?
1. Linear polynomial
 2. Weighted polynomial
 3. Polynomial
 4. Linear weighted polynomial
115. Translate the following statement into FOL. "For every a, if a is a PhD student, then a has a master degree"
1. $\forall a \text{ PhD}(a) \rightarrow \text{Master}(a)$
 2. $\exists a \text{ PhD}(a) \rightarrow \text{Master}(a)$
 3. A is true, B is true
 4. A is false, B is false
116. A mobile ad hoc network with less density, less mobility and frequent data transfer among the nodes has to employ
1. Proactive routing
 2. Reactive routing
 3. Cluster based routing
 4. Zone based routing
117. The queries in wireless sensor networks trigger
1. Dissemination
 2. Aggregation
 3. Congestion control
 4. Localization and tracking
118. To hide information inside a picture what technology is used
1. Rootkits
 2. Bitmapping
 3. Steganography
 4. Image Rendering
119. Sniffing is used to perform _____ finger printing.
1. Passive stack
 2. Active stack
 3. Passive banner grabbing
 4. Scanned
120. It is a program of hardware device that filters the information coming through an internet connection to a network or computer system.
1. Anti virus
 2. Cookies
 3. Firewall
 4. Cyber safety