

PART III

02 — COMPUTER SCIENCE AND ENGINEERING/INFORMATION TECHNOLOGY

(Answer ALL questions)

56. In bottom up evaluation of a syntax direction definition, inherited attributes can
- Always be evaluated
 - Evaluation only done if the definition has synthesized attributes
 - Be evaluated only if the definition is L-attributed
 - None of the above
57. Assume that the SLR parser for a grammar G has n_1 states and the LALR parser for G has n_2 states. Hence which one is true?
- n_1 is necessarily less than n_2
 - n_1 is necessarily greater than n_2
 - n_1 is necessarily equal to n_2
 - None of the above
58. The grammar $S \rightarrow aSa \mid bS \mid c$ is
- LL(1) but not LR(1)
 - LR(1) but not LR(1)
 - Both LL(1) and LR(1)
 - Neither LL(1) nor LR(1)
59. The following grammar production belongs to which parser?
- $$S \rightarrow Aa \mid bAc \mid dc \mid bda$$
- $$A \rightarrow d$$
- LL(1)
 - SLR(1)
 - LALR(1)
 - None of the above
60. Reaching Definitions are calculated using
- $IN[B] = f_B(OUT[B])$;
 $OUT[B] = \bigwedge_{P, pred(B)} IN[P]$
 - $IN[B] = f_B(OUT[B])$;
 $OUT[B] = \bigwedge_{S, succ(B)} IN[S]$
 - $OUT[B] = f_B(IN[B])$;
 $IN[B] = \bigwedge_{S, succ(B)} OUT[S]$
 - $OUT[B] = f_B(IN[B])$;
 $IN[B] = \bigwedge_{P, pred(B)} OUT[P]$
61. What is the total number of child processes that are forked by the following code segment?
- ```
main()
{
 ...
 fork();
 fork();
 fork();
 ...
}
```
- 3
  - 4
  - 7
  - 8
62. A System software that places the absolute code into main memory, beginning with the initial address assigned by the assembler and, in which no address manipulation is performed is called a/an
- Absolute loader
  - Linker
  - Relocating Loader
  - Compile and go Loader
63. Convoy effect is a resultant of
- One CPU bound and many I/O bound processes
  - Many CPU and I/O bound processes
  - Many CPU bound processes and less I/O bound processes
  - Proper mix of CPU and I/O bound processes
64. In a paged memory, the page hit ratio is 0.45. The time required to access a page in secondary memory is equal to 100 ns. The time required to access a page in primary memory is 10 ns. The average time required to access a page is
- 3.0 ns
  - 59.5 ns
  - 68.5 ns
  - 78.5 ns

65. If there are 32 segments, each of size 1 kbytes, then the logical address should have
- 13 bits
  - 14 bits
  - 15 bits
  - 16 bits
66. In distributed systems the processes on a remote systems are identified by their
- Host identifier
  - Host name and identifier
  - Identifier
  - Process identifier
67. Link and site failure in distributed systems is detected by
- Polling
  - Routing
  - Token passing
  - Handshaking
68. \_\_\_\_\_ is a framework for distributed objects using Borland Delphi.
- CORBA
  - DCOM
  - DDObjects
  - DDCom
69. Algorithms for distributed systems are difficult to design because of the
- Presence of shared memory
  - Presence of global time
  - Absence of global time
  - Presence of synchronized clocks
70. In a distributed system, if all writes requested by the applications at clients are also carried out at the servers immediately, the writing policy is called
- Write-through
  - Delayed-writing
  - Write on close
  - Write resolution
71. Which traversal does not use a stack?
- inorder
  - level order
  - postorder
  - preorder
72. Which of the following statement(s) is/are TRUE?
- A hash function takes a message of arbitrary length and generates a fixed length code.
  - A hash function takes a message of fixed length and generates a code of variable length.
  - A hash function may give the same hash value for distinct messages.
- 1 only
  - 2 and 3 only
  - 1 and 3 only
  - 2 only
73. What is the worst case time complexity of quicksort?
- $O(n^2)$
  - $O(n)$
  - $O(n \log_2 n)$
  - $O(\log_2 n)$
74. Which of the following is true?
- Hashing is a technique used for performing insertions, deletions and finds in constant average time.
  - Standard deletion cannot be performed in an open addressing hash table.
  - Extendible hashing is used when the amount of data is too large to fit in main memory.
- (i)
  - (iii)
  - (i) and (iii)
  - all the above

75. What is the condition for the existence of Eulerian cycle in an undirected graph?
- every vertex has even degree, and all of its vertices with nonzero degree are connected
  - one vertex has odd degree and every other vertex has even degree, and all of its vertices with nonzero degree are connected
  - two vertices have odd degree and every other vertex has even degree, and all of its vertices with nonzero degree are connected
  - the graph is fully connected
76. Let  $A$  be the problem of finding a Hamiltonian cycle in a graph  $G = (V, E)$ , with  $|V|$  divisible by 3 and  $B$  be the problem of determining if Hamiltonian cycle exists in such graphs. Which one of the following statement is true?
- $A$  is NP-hard, but  $B$  is not
  - Both  $A$  and  $B$  are NP-hard
  - $A$  is not, but  $B$  is NP-hard
  - Neither  $A$  nor  $B$  is NP-hard
77. Which of the following uses memoization?
- Dynamic programming approach
  - Greedy approach
  - Divide and conquer approach
  - None of the above
78. Let  $W(n)$  and  $A(n)$  denote respectively, the worst case and average case running time of an algorithm executed on an input of size  $n$ . Which of the following is ALWAYS TRUE?
- $A(n) = \Omega(W(n))$
  - $A(n) = \theta(W(n))$
  - $A(n) = O(W(n))$
  - $A(n) = o(W(n))$
79. Floyd-Warshall algorithm utilizes \_\_\_\_\_ to solve the all-pairs shortest paths problem on a directed graph in \_\_\_\_\_ time.
- Greedy algorithm,  $\theta(V^3)$
  - Greedy algorithm,  $\theta(V^2 \lg n)$
  - Dynamic programming,  $\theta(V^3)$
  - Dynamic programming,  $\theta(V^2 \lg n)$
80. A carry look ahead adder is frequently used for addition because
- It costs less
  - It is faster
  - It uses fewer gates
  - All of these.
81. Which registers of the processor are connected to Memory Bus?
- PC and IR
  - IR and MAR
  - PC and MAR
  - MAR and MDR
82. In CISC architecture most of the complex instructions are stored in
- Register
  - Diodes
  - Transistors
  - CMOS
83. Consider a non-pipelined processor with a clock rate of 2.5 gigahertz and average cycles per instruction of 4. The same processor is upgraded to a pipelined processor with five stages but due to the internal pipeline delay, the clock speed is reduced to 2 gigahertz. Assume there are no stalls in the pipeline. The speed up achieved in this pipelined processor is
- 3.2
  - 3.0
  - 2.2
  - 2.0
84. Consider a 4-way set associative cache consisting of 128 lines with a line size of 64 words. The CPU generates a 20-bit address of a word in main memory. The numbers of bits in the TAG, LINE and WORD fields are respectively
- 9,6,5
  - 7,7,6
  - 7,5,8
  - 9,5,6

85. Fast Fourier Transform algorithms exploit
- Summetry and periodicity
  - Four basic properties of phase factor
  - Complex multiplications
  - Indexing and addressing operations
86. Low pass butterworth filters are
- Nonmonotonic in stop band
  - All-pole filters
  - Pole-zero filters
  - Having magnitude squared frequency response
87. How many complex multiplications are need to be performed for each FFT algorithm?
- $(N/2)\log N$
  - $N\log_2 N$
  - $(N/2)\log_2 N$
  - None of the above
88. The realization of FIR filter by frequency sampling realization can be viewed as cascade of how many filters?
- Two
  - Three
  - Four
  - None of the above
89. Terminal emulation allows the following operation to be performed:
- A dummy terminal to pretend that it is a personal computer
  - A dummy terminal to produce a local echo
  - A personal computer to pretend that it is a computer terminal
  - Both a and b
90. Many low-speed channels are interwove into one high-speed transmission by the following:
- Frequency-division multiplexer
  - Time-division multiplexer
  - Both a and b
  - None of the above
91. The frequency range at which the land coaxial cables will be used is
- $10^6$  to  $10^8$  Hz
  - $10^{10}$  to  $10^{11}$  Hz
  - $10^3$  to  $10^4$  Hz
  - $10^{14}$  to  $10^{15}$  Hz
92. The number of cross point needed for 10 lines in a cross point switch is full duplex in nature and the number of self connection is
- 100
  - 45
  - 50
  - 90
93. Consider the relation employee(name, sex, supervisorName) with name as the key. supervisorName gives the name of the supervisor of the employee under consideration. What does the following Tuple Relational Calculus query produce?
- $$\{e.name \mid employee(e) \wedge (\forall x)[\neg employee(x) \vee x.supervisorName \neq e.name \vee x.sex = "male"]\}$$
- Names of employees with a male supervisor
  - Names of employees with no immediate male subordinates
  - Names of employees with no immediate female subordinates
  - Names of employees with a female supervisor
94. In distributed databases, location transparency allows for database users, programmers and administrators to treat the data as if it is at one location. A SQL query with location transparency needs to specify:
- Inheritances
  - Fragments
  - Locations
  - Local formats

95. If T consists of 500000 transactions, 20000 transaction contain bread, 30000 transaction contain jam, 10000 transaction contain both bread and jam. What is the confidence of buying bread with jam?

a. 33.33%  
b. 66.66%  
c. 45%  
d. 50%

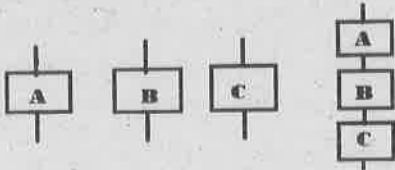
96. Which of the following is true regarding referential integrity?

a. Every primary key value must match a primary key value in an associated table  
b. Every primary key value must match a foreign key value in an associated table  
c. Every foreign key value must match a primary key value in an associated table  
d. Every foreign key value must match a foreign key value in an associated table

97. Which of the following is true concerning a global transaction?

a. The required data are at local site and the distributed DBMS routes requests as necessary  
b. The required data are located in at least one non local site and the distributed DBMS routes requests as necessary  
c. The required data are at local site and the distributed DBMS passes the request to only the local DBMS.  
d. The required data are located in at least one non local site and the distributed DBMS passes the request to only the local DBMS.

98. The cyclomatic complexity of each of the modules A, B and C shown in the figure is 5. What is the cyclomatic complexity of the sequential integration shown?



- a. 13  
b. 15  
c. 16  
d. 12

99. Which of the given statement(s) is/are true?

S1 : Coupling is the organization of various modules for consistency.  
S2 : Cohesion is the degree of interdependence between modules.  
S3 : If coupling is low and cohesion is high, it is easier to change a module without affecting others.

a. S1 and S2 only  
b. S3 only  
c. S1, S2, S3  
d. S1 only

100. Pair the activities in Software Development Life Cycle.

|                         |                                       |
|-------------------------|---------------------------------------|
| I. Requirements Capture | 1. Module development and integration |
| II. Design              | 2. Domain Analysis                    |
| III. Implementation     | 3. Structural and Behavior Modeling   |
| IV. Maintenance         | 4. Performance Tuning                 |

a. I - 3, II - 2, III - 4, IV - 1  
b. I - 2, II - 3, III - 1, IV - 4  
c. I - 3, II - 2, III - 1, IV - 4  
d. I - 2, II - 3, III - 4, IV - 1

101. A 4<sup>th</sup> Generation Technique is a package of

a. CASE Tools  
b. Software Programs  
c. Software Tools  
d. Agility Development

102. A report of software projects states: "Over 30% of software projects are cancelled before completion and over 70% fail to deliver expected features". What is the reason for this?

a. Lack of Quality Control  
b. Poor Change Management  
c. Poor Testing  
d. Improper Requirements management

103. Identify the testing which covers the entire functionality of a product but does not cover features of the product.
- Breadth Testing
  - Confirmation Testing
  - Domain Testing
  - Black box Testing
104. Find the total number of feasibility studies needed in Requirement Analysis?
- Two
  - Three
  - Four
  - Five
105. Identify the model which describes the static structure of the system using object classes and their relationships?
- Structural model
  - Subsystem model
  - Dynamic model
  - Sequence model
106. Which of the following in the below list is not a part of a software test design document?
- Test plan
  - Test Design Specification
  - Test Case Specification
  - Test log
107. Software Maturity Index =  $[Mt - (Fa + Fc + Fd)/Mt]$ . What is Fc?
- Number of deleted modules in current version compared to the previous version
  - Number of added modules in current version
  - Number of changed modules in current version
  - Number of changed modules in existing version
108. Observed states are
- Unseen scenarios
  - Positive scenarios
  - Calculated Negative Variables
  - Calculated Variables and Constraints
109. Classifying under multiple class labels is
- Binary classification
  - Naïve Bayes Classification
  - N-ary classification
  - Multi-class Classification
110. The measure of the degree to which nodes in a graph tend to cluster together is called
- Entropy
  - Clustering co-efficient
  - Inter-cluster measure
  - Intra-cluster measure
111. True negative is
- correctly rejected
  - incorrectly identified
  - correctly identified
  - incorrectly rejected
112. Propositional logic is
- Context dependent
  - Context independent
  - Context variant
  - None of the above
113. In Cellular communication, during dynamic channel assignment strategy, the base station requests channel from
- MSC
  - Neighbouring cell
  - Neighbouring cluster
  - Neighbouring base station
114. An optional central base used to connect stationary or mobile wireless station to a wireless network station is called
- Point to point
  - Multi point
  - Network point
  - Access point
115. Which of the following statement is true about spread spectrum?
- It uses a narrow band frequency
  - Spread Spectrum allocates disjoint resources (frequency or time slots depending on the access system) to each user
  - Spread Spectrum signals can be picked up by simple receivers
  - Spread spectrum signals are hard to jam and identify