

Answer Key CSE

Q1. C	Q32. A
Q2. B	Q33. D
Q3. B	Q34. D
Q4. C	Q35. B
Q5. D	Q36. A
Q6. D	Q37. B
Q7. B	Q38. A
Q8. B	Q39. C
Q9. A	Q40. A
Q10. C	
Q11. D	
Q12. C	
Q13. D	
Q14. C	
Q15. D	
Q16. A	
Q17. A	
Q18. B	
Q19. C	
Q20. B	
Q21. A	
Q22. A	
Q23. D	
Q24. A	
Q25. C	
Q26. A	
Q27. A	
Q28. A	
Q29. C	
Q30. A	
Q31. D	

6/11/25

Q1. Which of the following is a top-down approach in which the entity's higher level can be divided into two lower sub-entities?

- a) Aggregation
- b) Generalization
- c) Specialization
- d) All of the above

Q2. Which functional dependency types is/are not present in the following dependencies?

Empno $\rightarrow$ EName, Salary, Deptno, DName
DeptNo $\rightarrow$ DName
EmpNo $\rightarrow$ DName

- a) Full functional dependency
- b) Partial functional dependency
- c) Transitive functional dependency
- d) Both B and C

Q3. Consider the schema $R(S,T,U,V)$ and the dependencies $S \rightarrow T$, $T \rightarrow U$, $U \rightarrow V$, $V \rightarrow S$. Let $R = \{R_1, R_2\}$ such that $R_1 \cap R_2 = \Phi$. Then the decomposition is :

- a) not in 2NF
- b) in 2NF but not in 3NF
- c) in 3NF but not in 2NF
- d) in both 2NF and 3NF

Q4. The _____ graph describes deadlocks precisely

- a) Wound wait graph
- b) Wait die graph
- c) Wait for graph
- d) None of the mentioned

Q5. The _____ construct returns true if a given tuple is present in the subquery.

- a) not exists
- b) present
- c) not present
- d) exists

Q6. Which of the following is/are true

- a) `calloc()` allocates the memory and also initializes the allocated memory to zero, while memory allocated using `malloc()` has uninitialized data.
- b) `malloc()` and `memset()` can be used to get the same effect as `calloc()`.
- c) `calloc()` takes two arguments, but `malloc` takes only 1 argument.
- d) All of the above

Q7. What is recurrence for worst case of QuickSort and what is the time complexity in Worst case?

- a) Recurrence is $T(n) = T(n-2) + O(n)$ and time complexity is $O(n^2)$
- b) Recurrence is $T(n) = T(n-1) + O(n)$ and time complexity is $O(n^2)$
- c) Recurrence is $T(n) = 2T(n/2) + O(n)$ and time complexity is $O(n \log n)$
- d) Recurrence is $T(n) = T(n/10) + T(9n/10) + O(n)$ and time complexity is $O(n \log n)$

Q.8. Given an unsorted array. The array has this property that every element in array is at most k distance from its position in sorted array where k is a positive integer smaller than size of array. Which sorting algorithm can be easily modified for sorting this array and what is the obtainable time complexity?

- a) Insertion Sort with time complexity $O(kn)$
- b) Heap Sort with time complexity $O(n \log k)$
- c) Quick Sort with time complexity $O(k \log k)$
- d) Merge Sort with time complexity $O(k \log k)$

Q.9. Which of the given options provides the increasing order of asymptotic complexity of functions f_1 , f_2 , f_3 and f_4 ?

$$f_1(n) = 2^n$$

$$f_2(n) = n^{3/2}$$

$$f_3(n) = n \log n$$

$$f_4(n) = n^{(\log n)}$$

- a) f_3, f_2, f_4, f_1
- b) f_3, f_2, f_1, f_4
- c) f_2, f_3, f_1, f_4
- d) f_2, f_3, f_4, f_1

Q.10. Which of the following sorting algorithms can be used to sort a random linked list with minimum time complexity?

- a) Quick Sort
- b) Heap Sort
- c) Merge Sort
- d) None of these

Q.11. In the worst case, the number of comparisons needed to search a singly linked list of length n for a given element is

- a) $\log_2 n$
- b) $n/2$
- c) $\log_2 n - 1$
- d) n

Q.12. In a complete k -ary tree, every internal node has exactly k children or no child. The number of leaves in such a tree with n internal nodes is:

- a) nk
- b) $(n - 1)k + 1$
- c) $n(k - 1) + 1$
- d) $n(k - 1)$

Q.13. The programming language that has the ability to create new data types is called ____.

- a) Overloaded
- b) Encapsulated
- c) Reprehensible
- d) Extensible

Q.14. Which of the following statement is true about the `new` and `malloc`?

- I. The `"new"` is a type of operator while `"malloc"` is a kind of function
- II. `"new"` invokes a constructor, whereas `"malloc"` does not invoke the constructor
- III. `"malloc"` returns void pointer and also needed to typecast whereas `"new"` returns required the pointer

- a) Only I
- b) Both I and II
- c) I, II, III
- d) None of the above

Q.15. Which of the following statement is correct about Virtual Inheritance?

- a) It is a technique to ensure that a private member of a base class can be accessed
- b) It is a technique to optimize the multiple inheritances
- c) It is a technique to avoid the multiple inheritances of the classes
- d) It is a C++ technique to avoid multiple copies of the base class into the derived or child classes

Q.16. Which of the following can be used to create an abstract class in the C++ programming language?

- a) By using the pure virtual function in the class
- b) By declaring a virtual function in the base class
- c) By declaring the virtual keyword afterward, the class Declaration
- d) None of the above

Q.17. Which of the following is not a kind of inheritance?

- a) Distributed
- b) Multiple
- c) Multi-level
- d) Hierarchal

Q.18. Among the following, which statement is correct about the Modularity?

- a) Modularity means hiding the parts of the program
- b) Modularity refers to dividing a program into subsequent small modules or independent parts
- c) It refers to overloading the program's part
- d) Modularity refers to wrapping the data and its functionality into a single entity

Q.19. Which of the following can be considered as the members that can be inherited but not accessible in any class?

- a) Public
- b) Protected
- c) Private
- d) Both A and C

Q.20. Which sublayer of the data link layer performs data link functions that depend upon the type of medium?

- a) logical link control sublayer
- b) media access control sublayer
- c) network interface control sublayer
- d) error control sublayer

Q.21. Automatic repeat request error management mechanism is provided by _____

- a) logical link control sublayer
- b) media access control sublayer
- c) network interface control sublayer
- d) application access control sublayer

- Q.22. User datagram protocol is called connectionless because _____
- a) all UDP packets are treated independently by transport layer
 - b) it sends data as a stream of related packets
 - c) it is received in the same order as sent order
 - d) it sends data very quickly
- Q.23. A regular language over an alphabet Σ is one that cannot be obtained from the basic languages using the operation
- a) Union
 - b) Concatenation
 - c) Kleene*
 - d) All of the mentioned
- Q.24. Which of the following derivations does a top-down parser use while parsing an input string?
- a) Leftmost derivation
 - b) Leftmost derivation in reverse
 - c) Rightmost derivation
 - d) Rightmost derivation in reverse
- Q.25. The process of assigning load addresses to the various parts of the program and adjusting the code and data in the program to reflect the assigned addresses is called?
- a) Assembly
 - b) Parsing
 - c) Relocation
 - d) Symbol resolute
- Q.26. Which of the following statements is false?
- a) Left as well as right most derivations can be in Unambiguous grammar
 - b) An LL (1) parser is a top-down parser
 - c) LALR is more powerful than SLR
 - d) Ambiguous grammar can't be LR (k)
- Q.27. What is the condition for proper coloring of a graph?
- a) two vertices having a common edge should not have same color
 - b) two vertices having a common edge should always have same color
 - c) all vertices should have a different color
 - d) all vertices should have same color
- Q.28. The number of colors used by a proper coloring graph is called?
- a) k coloring graph
 - b) x coloring graph
 - c) m coloring graph
 - d) n coloring graph
- Q.29. In a perfect matching of graph G, every vertex is connected to how many edges?
- a) At most one
 - b) At least one
 - c) Exactly one
 - d) Zero
- Q.30. In a graph G, the total number of edges in maximum matching is called?
- a) Matching number
 - b) Chromatic number
 - c) Domination number
 - d) Independence number

- Q.31. Which of the following statement is false?
- a) Context free language is the subset of context sensitive language
 - b) Regular language is the subset of context sensitive language
 - c) Recursively enumerable language is the super set of regular language
 - d) Context sensitive language is a subset of context free language
- Q.32. A language is regular if and only if
- a) accepted by DFA
 - b) accepted by PDA
 - c) accepted by LBA
 - d) accepted by Turing machine
- Q.33. Regular expression are
- a) Type 0 language
 - b) Type 1 language
 - c) Type 2 language
 - d) Type 3 language
- Q.34. L and $\sim L$ are recursive enumerable then L is
- a) Regular
 - b) Context free
 - c) Context sensitive
 - d) Recursive
- Q.35. Let A and B be two events such that the occurrence of A implies occurrence of B , But not vice-versa, then the correct relation between $P(a)$ and $P(b)$ is?
- a) $P(A) < P(B)$
 - b) $P(B) \geq P(A)$
 - c) $P(A) = P(B)$
 - d) $P(A) \geq P(B)$
- Q.36. What is the probability of an impossible event?
- a) 0
 - b) 1
 - c) Not defined
 - d) Insufficient data
- Q.37. Problems that can be solved in polynomial time are known as?
- a) intractable
 - b) tractable
 - c) decision
 - d) complete
- Q.38. _____ is the class of decision problems that can be solved by non-deterministic polynomial algorithms.
- a) NP
 - b) P
 - c) Hard
 - d) Complete

Q.39. Problems that cannot be solved by any algorithm are called?

- a) tractable problems
- b) intractable problems
- c) undecidable problems
- d) decidable problems

Q.40. To which class does the Euler's circuit problem belong?

- a) P class
- b) NP class
- c) Partition class
- d) Complete class