Course Code: 20CS0523 **R20**

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QUESTION BANK(OBJECTIVE)

Course & Branch: B.Tech – Common to CSE,CSM,CIC,CSIT
Year & Sem: III-B. Tech & II-Sem
Subject with Code: 20CS0523 & Design And Analysis of Algorithm
Regulation: R20

UNIT-1

1. There are _____steps to solve the problem **[ ]**
A. Seven B. Four C. Six D.Two

2. _____is the first step in solving the problem **[ ]**
A. Understanding the Problem B. Identify the Problem
C. Evaluate the Solution D. None of these

3. _____is the last step in solving the problem **[ ]**
A. Understanding the Problem B. Identify the Problem
C. Evaluate the Solution D. None of these

4. Following is true for understanding of a problem **[ ]**
A. Knowing the knowledgebase B. Understanding the subject on which the problem is based
C. Communication with the client D. All of the above

5. The six-step solution for the problem can be applied to **[ ]**
I. Problems with Algorithmic Solution
II. Problem with Heuristic Solution
A. Only I B. Only II C.Both I and II D. Neither I nor II

6. _____ solution requires reasoning built on knowledge and experience **[ ]**
A. Algorithmic Solution B. Heuristic Solution C. Random Solution D. None of these

7. While solving the problem with computer the most difficult step is _____. **[ ]**
A. describing the problem B. finding out the cost of the software
C. writing the computer instructions D. testing the solution

8. The correctness and appropriateness of _____solution can be checked very easily. **[ ]**
A. algorithmic solution B. heuristic solution
C. random solution D. none of these

9. The branch of computer that deals with heuristic types of problem is called _____ **[ ]**
A. system software B. real time software
C. artificial intelligence D. none of these

10. In analysis of algorithm, approximate relationship between the size of the job and the amount of work required to do is expressed by using _____ **[ ]**
A.Central tendency B. Differential equation
C. Order of execution D. Order of magnitude

11. The function f(n)=O(g(n)) if there exists positive constant C and n_o such that **[ ]**
A. $f(n) \neq c * g(n)$ for all n, $n \geq no$ B. $f(n) > c * g(n)$ for all n, $n \geq no$
C. $f(n) = c * g(n)$ for all n, $n \geq no$ D. $f(n) \leq c * g(n)$ for all n, $n \geq no$

12. In function $f(n) = \Omega(g(n))$, the function g is **[ ]**

A. Upper bound B. Lower bound
C. Unbounded function D. Cannot be determine

13. The Process of exectig a correct program a correct program on data sets and measuring the time and space is called **[ ]**
A. Profiling B. Debugging C. Designing D. Identifying

14. In which of the following testing method we collect actual statistics about the algorithm consumption of time and space **[ ]**
A. Priori testing B. Normal testing C. Posteriori testing D. Debugging

15. Following is the relationship between the computing times O(log n), O(n log n), $O(2^n)$ and $O(n^2)$ **[ ]**
A. O(log n)< O(n2)<O(n log n)< O(2n)
B. O(2n)<O(log n)<O(n2)<O(n log n
B.O(log n)< O(n log n)< O(n2)<O(2n)
D. O(n2)<O(n log n) < O(log n)< O(2n)

16. Binary search In successful searches Best case is **[ ]**
A.Θ (1) B. Θ (n) C. Θ (n logn) D. Θ (log n)

17. In unsuccessful searches binary search worst is **[ ]**
A. Θ(log n) B. Θ(n) C. Θ(log n) D. o(n/2)

18. Binary search In successful searches average case is **[ ]**
A. Θ(log n) B. Θ(n) C. Θ(nlogn) D. Θ(log n)

19. In Strassen's matrix multiplication c11 is **[ ]**
A. P+S-T+V B. P+S C. T+V D. P+S-T

20. A Recursive algorithm is a function that is defined in terms of ---------- **[ ]**
A. Itself B. indirect C. direct D. sort

21. The function f(n) =Ω(g(n)) if there exist positive constants c and n0 such that --------- **[ ]**
A. f(n)>=c*g(n) B. f(n)<=c*g(n) C. f(n)=c*g(n) D. f(n)/c*g(n)

22. ____is the expression of an algorithm in a programming language **[ ]**
A. Performance B. effectiveness C. program D. validation

23. _____ is a finite set of instructions that accomplishes a particular task. **[ ]**
A.Input B. Output C. Algorithm D. Fineness

24. The word algorithm comes from the name of the author---------- **[ ]**
A. Bilgates B. Abu jafar Mohammed ibn musa al khowarizmi
C. Darwin D. Bubbage

25. The best case complexity of binary search in unsuccessful search **[ ]**
A. O (N) B. θ(N) C. θ(N+1) D. O(N+1)

26 In ---------- method the worst, average, best cases are same. **[ ]**
A. heap sort B. merge sort C. quick sort D. insertion

27. The recurrence relation of maxmin is ____when n= **[ ]**
A. C (n)=1 B. C(n)=3 C. C(n)=2 D. NONE

28. For analyzing an algorithm, which is better computing time? **[ ]**
A. O (100 Log N) B. O (N) (c) O (2N) C. O (N logN) D. O (N2).

29. Consider the usual algorithm for determining whether a sequence of parentheses is balanced. What is the maximum number of parentheses that will appear on the stack at any one time when the algorithm analyzes: (()(())(()) **[ ]**
A. 1 B. 2 C.3 D.4

30. Recursive algorithms are based on **[ ]**
A. Divide and conquer approach B. Top-down approach
C. Bottom-up approach D. Hierarchical approach

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31. There are four algorithms A1, A2, A3, A4 to solve the given problem with the order log(n), nlog(n), log(log(n))n/log(n), Which is the best algorithm. **[ ]**

A. A1 B. A2 C. A3 D. A4

32. Express the formula (n-1)*(n-5) in terms of big Oh notation **[ ]**

A. O(1) B. O(log n C. O(n) D. O(n2)

33. What is the objective of tower of hanoi puzzle? [ ]

A.To move all disks to some other rod by following rules

B. To divide the disks equally among the three rods by following rules

C. To move all disks to some other rod in random order

D. To divide the disks equally among three rods in random order

34. Which of the following is NOT a rule of tower of hanoi puzzle? **[ ]**

A. No diskshould be placed over a smaller disk

B. Disk can only be moved if it is the uppermost disk of the stack

C. No disk should be placed over a larger disk

D. Only one disk can be moved at a time

35. The time complexity of the solution tower of hanoi problem using recursion is _____ **[ ]**

A. O(n2) B. O(2n) C.O(n log n) D. O(n)

36. Recurrence equation formed for the tower of hanoi problem is given by _____ **[ ]**

A. T(n) = 2T(n-1)+n B. T(n) = 2T(n/2)+c C. T(n) = 2T(n-1)+c D. T(n) = 2T(n/2)+n

37. Minimum number of moves required to solve a tower of hanoiproblem with n disks is ____ **[ ]**

A. 2n B. 2n-1 C.n2 D. n2-1

38. Recursve soluton of tower of hanoi problem is an example of which f the following the following algorithm? **[ ]**

A. Dynamic programming B. Backtracking

C. Greedy algorithm D. Divide and conquer

39. Tower of hanoi problem can be solved iteratively. **[ ]**

A. True B.False C. A&B D.None

40. Minimum time required to solve tower of hanoi puzzle with 4 disks assuming one move take 2 seconds,wii be__ **[ ]**

A. 15 seconds B. 30 seconds C. 16 seconds D. 32 seconds

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UNIT-2

1. Breadth First Search is equivalent to which of the traversal in the Binary Trees? **[ ]**

A. Pre-order Traversal B. Post-order Traversal C. Level-order Traversal D. In-order Traversal

2. Time Complexity of Breadth First Search is? (V – number of vertices, E – number of edges) **[ ]**

A. O(V + E) B. O(V) C. O(E) D. O(V*E)

3. The Data structure used in standard implementation of Breadth First Search is? **[ ]**

A. Stack B.Queue C. Linked List D. Tree

4. The Breadth First Search traversal of a graph will result into? **[ ]**

A. Linked List B. Tree C. Graph with back edges D. Arrays

5. A person wants to visit some places. He starts from a vertex and then wants to visit every place connected to this vertex and so on. What algorithm he should use? **[ ]**

A.DFS B. BFS C.Prim'S Algorthm D. Kruskal's Algorithm

6. Which of the following is not an application of Breadth First Search? [ ]

A. Finding shortest path between two nodes B. Finding bipartitions of a graph

C. GPS navigation system D. Path Finding

7. When the Breadth First Search of a graph is unique? [ ]

A. When the graph is a Binary Tree B. When the graph is a Linked List

C. When the graph is a n-ary Tree D. When the graph is a Ternary Tree

8. Regarding implementation of Breadth First Search using queues, what is the maximum distance between two nodes present in the queue? (considering each edge length 1) **[ ]**

A. Can be anything B.0 C. At most 1 D. Insufficient Information

9. In BFS, how many times a node is visited? **[ ]**

A. Once B. Twice C. Equivalent to number of in degree of the node D. Thrice

10. Which of the following is not an application of Depth First Search? **[ ]**

A.For generating topological sort of a graph B. Peer to Peer Networks

C. Detecting cycles in the graph D. For generating Strongly Connected Components of a directed graph

11. For an undirected graph G with n vertices and e edges, the sum of the degrees of each vertex is **[ ]**

A. ne B. 2n C. 2e D. e^n

12. A complete graph can have..... **[ ]**

A. n^2 spanning trees B.n^(n-2) spanning trees C. n^(n+1) spanning trees D.n^n spanning trees

13. Graph traversal is different from a tree traversal, because: **[ ]**

A. trees are not connected B. graphs may have loops C. trees have root D. None of these

14. The number of edges in a simple, n-vertex, complete graph is **[ ]**

A.n*(n-2) B.n*(n-1) C.n*(n-1)/2 D.n*(n-1)*(n-2)

15. Graphs are represented using ..... **[ ]**

A.Adjacency tree B.Adjacency linked list C.Adjacency graph D.Adjacency queue

16. The spanning tree of connected graph with 10 vertices contains..... **[ ]**

A. 9 edges B. 11 edges C. 10 edges D. 9 vertices

17. If locality is a concern, you can use ..... to traverse the graph. **[ ]**

A. Breadth First Search B. Depth First Search C. Either BFS or DFS D. None of these

18. Which of the following algorithms solves the all-pair shortest path problem? **[ ]**

A. Floyd's algorithm B. Prim's algorithm C. Dijkstra's algorithm D. Warshall's algorithm

19. The minimum number of colors needed to color a graph having n (>3) vertices and 2 edges is **[ ]**

A.1 B.2 C.3 D.4

20. Which of the following is useful in traversing a given graph by breadth first search? [ ]

A. set B. List C. stacks D. Queue

21. From a complete graph, by removing maximum _____ edges, we can construct a spanning tree. [ ]

A. e-n+1 B. n-e+1 C. n+e-1 D. e-n-1

22. Minimum number of spanning tree in a connected graph is [ ]

A.n B.(n-1) C.1 D.0

23. Find the odd out [ ]

A. Prim's Minimal Spanning Tree Algorithm B. Kruskal's Minimal Spanning Tree Algorithm

C. Floyd-Warshall'sAll pair shortest path Algorithm D. Dijkstra's Minimal Spanning Tree Algorithm

24. What will be the running-time of Dijkstra's single source shortest path algorithm, if the graph G(V,E) is stored in form of adjacency list and binary heap is used [ ]

A. O(|V|2) B. O(|V| log |V|) C. O(|E|+|V| log |V|) D. None of these

25. Maximum degree of any vertex in a simple graph of vertices n is [ ]

A. 2n – 1 B.n C.O(log n) D.O(log (log n))

26. A directed graph is ___if there is a path from each vertex to every other vertex in the digraph. [ ]

A. Weakly connected B. Strongly Connected C. Tightly Connected D. Linearly Connected

27. Consider a complete graph G with 4 vertices. The graph G has ____ spanning trees. [ ]

A.15 B.8 C.16 D.13

28. The travelling salesman problem can be solved using _____ [ ]

A.A spanning tree. B. minimum spanning tree C. Bellman – Ford algorithm D. DFS traversal

29. Consider a undirected graph G with vertices { A, B, C, D, E}. In graph G, every edge has distinct weight. Edge CD is edge with minimum weight and edge AB is edge with maximum weight. Then, which of the following is false? [ ]

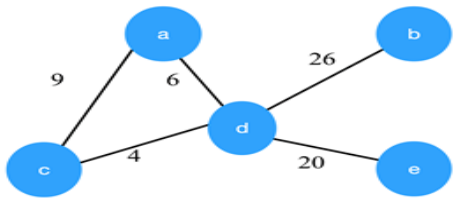
A. Every minimum spanning tree of G must contain CD

B. If AB is in a minimum spanning tree, then its removal must disconnect G

C. No minimum spanning tree contains AB

G has a unique minimum spanning tree

30. Consider the graph shown below. Which of the following are the edges in the MST of the given graph? [ ]



A. (a-c)(c-d)(d-b)(d-b) B. (c-a)(a-d)(d-b)(d-e)

C. (a-d)(d-c)(d-b)(d-e) D. (c-a)(a-d)(d-c)(d-b)(d-e)

31. The time complexity of PRIMs algorithm---------- [ ]

A.$O(n^2)$ B.O(n) C.O (log n) D.O (n log n^2)

32. The upper bound on the time complexity of the nondeterministic sorting algorithm is [ ]

A. O (n) B. O (n log n) C. O (1) D. O (log n)

33. The worst case time complexity of the nondeterministic dynamic knapsack algorithm is [ ]

A.O(n log n B.O(log n) C.O(n2) D.O(n)

34. Worst case efficiency of binary search is [ ]

A. log2 n + 1 B.n C.n^2 D. 2n

35. The straight maxim in requires _____ elements comparisons in worst case [ ]

A. 2n B. 2n – 1 C. 2[n-1] D. 2n+1

36. The worst case time complexity of Merge sort is ----------. **[ ]**

A.o(n log n) B.o(nlogn/2) C.nlogn D.log(n)

37. Merge sort method worst case is **[ ]**

A. n*log(n) B.O(log n) C. O (1) D. O (log n)

38. Binary Tree method worst case is **[ ]**

A. O(log n) B. n*log(n) C. O (1) D. O (log n)

39. The time complexity for creating a tree is **[ ]**

A. O(log n) B. n*log(n) C. O (log n) D. O (1)

40. The Worst case for creating a tree is **[ ]**

A.O(n log n) B.O(h) C.O(n^2) D.O(n)

UNIT-3

1. Which of the following is true? **[ ]**

A. Prim's algorithm initialises with a vertex

B. Prim's algorithm initialises with a edge

C. Prim's algorithm initialises with a vertex which has smallest edge

D. Prim's algorithm initialises with a forest

2. Consider the given graph. **[ ]**

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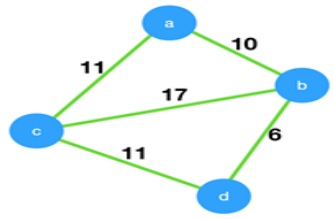


What is the weight of the minimum spanning tree using the Prim's algorithm, starting from vertex a?

A.23 B.28 C.27 D.11

3. Worst case is the worst case time complexity of Prim's algorithm if adjacency matrix is used? [ ]

A. O(log V) B. O(V2) C. O(E2) D. O(V log E)

4. Prim's algorithm is a _____ [ ]

A. Divide and conquer algorithm B. Greedy algorithm

C. Dynamic Programming D. Approximation algorithm

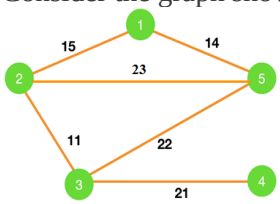
5. Prim's algorithm resembles Dijkstra's algorithm. [ ]

A.True B.False C. A&B D.None

6. Kruskal's algorithm is best suited for the sparse graphs than the prim's algorithm. [ ]

A.True B.False C. A&B D.None

7. Consider the graph shown below. [ ]



Which of the following edges form the MST of the given graph using Prim'a algorithm, starting from vertex 4

A. (4-3)(5-3)(2-3)(1-2) B.) (4-3)(3-5)(5-1)(1-2) C. (4-3)(3-5)(5-2)(1-5) D. (4-3)(3-2)(2-1)(1-5)

8. Prim's algorithm is also known as _____ [ ]

A. Dijkstra–Scholten algorithm B. Borůvka's algorithm C. Floyd–Warshall algorithm D. DJP Algorithm

9. Prim's algorithm can be efficiently implemented using _____ for graphs with greater density. [ ]

A. d-ary heap B. linear search C. fibonacci heap D. binary search

10. Which of the following is false about Prim's algorithm? [ ]

A. It is a greedy algorithm

B. It constructs MST by selecting edges in increasing order of their weights

C. It never accepts cycles in the MST

D. It can be implemented using the Fibonacci heap

11. Kruskal's algorithm is used to _____ [ ]

A. Find minimum spanning tree B. find single source shortest path

C. Find all pair shortest path algorithm D. traverse the graph

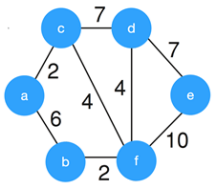
12. Kruskal's algorithm is a _____ [ ]

A. Divide and conquer algorithm B. Dynamic programming algorithm

C. Greedy algorithm D. Approximation algorithm

Consider the given graph. [ ]

13.



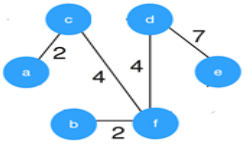
What is the weight of the minimum spanning tree using the Kruskal's algorithm?

A.24 B.23 C.15 D.19

14. What is the time complexity of Kruskal's algorithm? [ ]

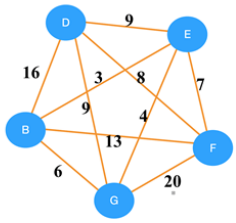
A.O(log V) B.O(E log V) C.O(E2) D.O(V log E)

15. Consider the following graph. Using Kruskal's algorithm, which edge will be selected first? [ ]



A. GF B. DE C. BE D. BG

16. Which of the following edges form minimum spanning tree on the graph using kruskals algorithm? [ ]



A.(B-E)(G-E)(E-F)(D-F) B.(B-E)(G-E)(E-F)(B-G)(D-F)

B. (B-E)(G-E)(E-F)(D-E) D. (B-E)(G-E)(E-F)(D-F)(D-G)

17. Which of the following is true? [ ]

A.Prim's algorithm can also be used for disconnected graphs

B. Kruskal's algorithm can also run on the disconnected graphs

C. Prim's algorithm is simpler than Kruskal's algorithm

D. In Kruskal's sort edges are added to MST in decreasing order of their weights

18. Which of the following is false about the Kruskal's algorithm? [ ]

A.It is a greedy algorithm

B.It constructs MST by selecting edges in increasing order of their weights

C. It can accept cycles in the MST

D. It can accept cycles in the MST

19. Kruskal's algorithm is best suited for the dense graphs than the prim's algorithm. [ ]

A.True B.False C. A&B D.None

20. Consider the following statements. [ ]

S1. Kruskal's algorithm might produce a non-minimal spanning tree.

S2. Kruskal's algorithm can efficiently implemented using the disjoint-set data structure.

A.S1 is true but S2 is false B.Both S1 and S2 are false

C.Both S1 and S2 are true D.S2 is true but S1 is false

21. The Knapsack problem is an example of _____ [ ]

A. Greedy algorithm B. 2D dynamic programming

C. 1D dynamic programming D. Divide and conquer

22. Which of the following methods can be used to solve the Knapsack problem? [ ]

A. Brute force algorithm B. Recursion

C. Dynamic programming D. Brute force, Recursion and Dynamic Programming

23. You are given a knapsack that can carry a maximum weight of 60. There are 4 items with weights {20, 30, 40, 70} and values {70, 80, 90, 200}. What is the maximum value of the items you can carry using the knapsack? [ ]

A.160 B. 200 C.170 D.90

24. Which of the following problems is equivalent to the 0-1 Knapsack problem? [ ]

A. You are given a bag that can carry a maximum weight of W. You are given N items which have a weight of {w1, w2, w3,….,wn} and a value of {v1, v2, v3,…., vn}. You can break the items into smaller pieces. Choose the items in such a way that you get the maximum value

B. You are studying for an exam and you have to study N questions. The questions take {t1, t2, t3,….,tn} time(in hours) and carry {m1, m2, m3,…., mn} marks. You can study for a maximum of T hours. You can either study a question or leave it. Choose the questions in such a way that your score is maximized

C. You are given infinite coins of denominations {v1, v2, v3,…..,vn} and a sum S. You have to find the minimum number of coins required to get the sum S

D. You are given a suitcase that can carry a maximum weight of 15kg. You are given 4 items which have a weight of {10, 20, 15,40} and a value of {1, 2, 3,4}. You can break the items into smaller pieces. Choose the items in such a way that you get the maximum value

25. What is the time complexity of the brute force algorithm used to solve the Knapsack problem? **[ ]**

A.O(n) B.O(n!) C.O(2n) D.O(n3)

26. The 0-1 Knapsack problem can be solved using Greedy algorithm. **[ ]**

A.True B.False C. A&B D.None

27. In Greedy method, Knapsack problem profits and weights are----------numbers **[ ]**

A. Both positive B.one positive one negative C.both negative D.fraction numbers

28. In dynamic programming an optimal sequence of decisions is obtained by **[ ]**

A. principle of optimality B. optimal merge pattern

C. shortest path D. none

29. The multi stage graph problem is to find----------path from s to t. **[ ]**

A. minimum cost B. maximum cost C. both D. none

30. If (Pj,Wj) and (Pk,Wk) are two pairs such that Pj≤Pk and Wj≥Wk, then delete (Pj,Wj) is **[ ]**

A. Purging rule B. Merging rule C. Both D. None

31. Algorithm which solves the all-pair shortest path problem is **[ ]**

A. Dijkstra B. Floyd C. Prim's D. Warshall's

32. TSP stands for---------- **[ ]**

A. Travelling Sales Person B. Tree Vertex Splitting

C. Travelling Search Process D. Tree Search Process

33. Algorithm TPS takes ----------time. **[ ]**

A. o(n) B. o(n*n) C. o(logn) D. o(nlogn)

34. For any job I the profit Pi is earned if the job is complete by its -------- **[ ]**

A. Dead line B. equality C. feasibility D. similarity

35. All connected graphs of n nodes with n-1 edges are ---------- **[ ]**

A. Trees B. vertices C. spanning tree D. graph

36. In Binary search tree, all the identifiers in the right sub tree are ----------than the identifier in the root node **[ ]**

A. Lesser B. greater C. equal D. not equal

37. _____will usually be much harder to solve than subset problems. **[ ]**

A. swapping problems B.permutation problems C.knapsack problem D. TSP

38. In travelling sales person problem, the number of distinct sets S of size k not including 1 and I is ____ **[ ]**

A.(k^{n-2}) B.n C.n-1 D.n-2

39. If a Binary Search tree represents n identifiers, then there will be exactly *n*- internal nodesand ---------- external nodes. **[ ]**

A. n + 2 B. n + 1 C. n – 1 D. n-2

40. _____is the naive method for solving traveling salesman problems. **[ ]**

A. The brute force approach B. The branch-and-bound method

C.Dynamic programming D. The nearest neighbor method

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UNIT-4

1. Which of the problems cannot be solved by backtracking method? **[ ]**

A. n-queen problem B. subset sum problem

C. Hamiltonian circuit problem D. Travelling salesman problem

2. Backtracking algorithm is implemented by constructing a tree of choices called as? **[ ]**

A.State-space tree B.State-chart tree C.Node tree D.Backtracking tree

3. What happens when the backtracking algorithm reaches a complete solution? **[ ]**

A.It backtracks to the root

B.It continues searching for other possible solutions

C.It traverses from a different route

D.Recursively traverses through the same route

4. A node is said to be _____ if it has a possibility of reaching a complete solution **[ ]**

A.Non-promising B.Promising C.Succeeding D.Preceding

5. In what manner is a state-space tree for a backtracking algorithm constructed? **[ ]**

A.Depth-first search B.Breadth-first search C.Twice around the tree D.Nearest neighbour first

6. The leaves in a state-space tree represent only complete solutions. **[ ]**

A.True B.False C. A&B D.None

7. In general, backtracking can be used to solve? **[ ]**

A.Numerical problems B.Exhaustive search C.Combinatorial problems D.Graph coloring problems

8. Which one of the following is an application of the backtracking algorithm? **[ ]**

A.Finding the shortest path B.Finding the efficient quantity to shop

C.Ludo D.Crossword

9. Backtracking algorithm is faster than the brute force technique **[ ]**

A.True B.False C. A&B D.None

10. Which of the following logical programming languages is not based on backtracking? **[ ]**

A.Icon B.Prolog C.Planner D.Fortran

11. The problem of finding a list of integers in a given specific range that meets certain conditions is called? **[ ]**

A.Subset sum problem B.Constraint satisfaction problem

C.Hamiltonian circuit problem D.Travelling salesman problem

12. Who coined the term 'backtracking'? **[ ]**

A.Lehmer B.Donald C.Ross D.Ford

13. _____ enumerates a list of promising nodes that could be computed to give the possible solutions of a given problem. **[ ]**

A.Exhaustive search B.Brute force C.Backtracking D.Divide and conquer

14. The problem of finding a subset of positive integers whose sum is equal to a given positive integer is called as? **[ ]**

A.n- queen problem B.Subset sum problem C.Knapsack problem D.Hamiltonian circuit

15. The problem of placing n queens in a chessboard such that no two queens attack each other is called as? **[ ]**

A.n-queen problem B.eight queens puzzle C.four queens puzzle D.1-queen problem

16. How many solutions are there for 8 queens on 8*8 boards? **[ ]**

A.12 B.91 C.92 D.93

17. Who publish the bitwise operation method to solve the eight queen puzzle? **[ ]**

A.ZongyanQiu B.Martin Richard C.Max Bezzel D.Frank Nauck

18. How many fundamental solutions are there for the eight queen puzzle? [ ]

A.92 B.10 C.11 D.12

19. Is it possible to have no four queens in a straight line as the part of one of the solution to the eight queen puzzle [ ]

A.True B.False C. A&B D.None

20. How many fundamental solutions are the for 3 queens on a 3*3 board? [ ]

A.1 B.12 C.3 D.0

21. The six queen puzzle has a fewer solution than the five queen puzzle [ ]

A.True B.False C. A&B D.None

22. Which ordered board is the highest enumerated board till now? [ ]

A.25*25 B.26*26 C.27*27 D.28*28

23. In how many directions do queens attack each other? [ ]

A.1 B.2 C.3 D.4

24. Placing n-queens so that no two queens attack each other is called? [ ]

A.n-queen's problem B.8-queen's problem C.Hamiltonian circuit problem D.Subset sum problem

25. Where is the n-queens problem implemented [ ]

A.Carom B.chess C.ludo D.cards

26. Not more than 2 queens can occur in an n-queens problem. [ ]

A.True B.False C. A&B D.None

27. In n-queen problem, how many values of n do not provide an optimal solution? [ ]

A.1 B.2 C.3 4.D

28. Which of the following methods can be used to solve n-queen's problem? [ ]

A.Greedy algorithm B.Divide and conquer C.Iterative improvement D.Backtracking

29. The following given options, which one of the following is a correct option that provides an optimal solution for 4-queens problem [ ]

A.(3,1,4,2) B.(2,3,1,4) C.(4,3,2,1) D.(4,2,3,1)

30. How many possible solutions exist for an 8-queen problem? [ ]

A.100 B.98 C.92 D.88

31. How many possible solutions occur for a 10-queen problem? [ ]

A.850 B.742 C.842 D.724

32. The following given options, which one of the following does not provides an optimal solution for 8-queens problem? [ ]

A.(5,3,8,4,7,1,6,2) B.(1,6,3,8,3,2,4,7) C.(4,1,5,8,6,3,7,2) D.(6,2,7,1,4,8,5,3)

33. Hamiltonian path problem is _____ [ ]

A.NP problem B.N class problem C.P class problem D.NP complete problem

34. Which of the following problems is similar to that of a Hamiltonian path problem? [ ]

A.Knapsack problem B.Closest pair problem

C.Travelling salesman problem D.Assignment problem

35. Who formulated the first ever algorithm for solving the Hamiltonian path problem? [ ]

Martello Monte Carlo Leonard Bellman

36. In what time can the Hamiltonian path problem can be solved using dynamic programming? [ ]

A.O(N) B.O(N log N) C.O(N2) D.O(N2 2N)

37. In graphs, in which all vertices have an odd degree, the number of Hamiltonian cycles through any fixed edge is always even. [ ]

A.True B.False C. A&B D.None

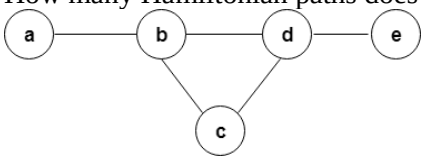
38. Who invented the inclusion-exclusion principle to solve the Hamiltonian path problem? [ ]

A.Karp B.Leonard Adleman C.Andreas Bjorklund D.Martello

39. For a graph of degree three, in what time can a Hamiltonian path be found? [ ]

A.O(0.251n) B.O(0.401n) C.O(0.167n) D.O(0.151n)

40. How many Hamiltonian paths does the following graph have? [ ]



A.1 B.2 C.3 D.4

UNIT-5

1. The worst-case efficiency of solving a problem in polynomial time is? [ ]

A.O(p(n)) B.O(p(n log n)) C. O(p(n2)) D. O(p(m log n))

2. Problems that can be solved in polynomial time are known as? [ ]

a. Intractable b. Tractable c. Decision d. Complete

3. The sum and composition of two polynomials are always polynomials. [ ]

A.True B.False C.A&B D.None

4. _____ is the class of decision problems that can be solved by non-deterministic polynomial algorithms? [ ]

A. NP B. P C. Hard D. Complete

5. Problems that cannot be solved by any algorithm are called? [ ]

A. Tractable problems B. Intractable problems C. Undecidable problems D. Decidable problems

6. The Euler's circuit problem can be solved in? [ ]

A. O(N) O(N log N) O(log N) O(N2)

7. To which class does the Euler's circuit problem belong? [ ]

P class NP class Partition class Complete class

8. Halting problem is an example for? [ ]

Decidable problem Undecidable problem Complete problem Tractable problem

9. How many stages of procedure does a non-deterministic algorithm consist of? [ ]

A.1 B.2 C.3 D.4

10. A non-deterministic algorithm is said to be non-deterministic polynomial if the time-efficiency of its verification stage is polynomial [ ]

A.True B.False C.A&B D.None

11. How many conditions have to be met if an NP- complete problem is polynomial reducible? [ ]

A.1 B.2 C.3 D.4

12. To which of the following class does a CNF-satisfiability problem belong? [ ]

NP class P class NP complete NP hard

13. How many steps are required to prove that a decision problem is NP complete? [ ]

A.1 B.2 C.3 D.4

14. Which of the following problems is not NP complete? [ ]

Hamiltonian circuit Bin packing Partition problem Halting problem

15. The choice of polynomial class has led to the development of an extensive theory called _____ [ ]

Computational complexity Time complexity Problem complexity Decision complexity

16. The class P is the set of all decision problems that: [ ]

A.Can be solved by polynomial-time algorithms.

B.Can definitely not be solved by polynomial-time algorithms.

C.Have polynomial-time algorithms that can verify potential solutions.

D.All of the above.

17. The class NP is the set of all decision problems that: [ ]

A. Can be solved by polynomial-time algorithms.

B. Can definitely not be solved by polynomial-time algorithms

C. Have polynomial-time algorithms that can verify potential solutions

D. All of the above

18. The class NP–complete is the set of all decision problems that: [ ]

A. Can be solved by polynomial-time algorithms.

B. Can definitely not be solved by polynomial-time algorithms

C. Have polynomial-time algorithms that can verify potential solutions

D. None of the above

19. Suppose $X \leq_p Y$. Which must be true? [ ]

A.Problem X is polynomial-time reducible to problem Y

B. Problem Y is polynomial-time reducible to problem X.

C. Problems X and Y are polynomial-time equivalent.

D. All of the above

20. Suppose $X \equiv_p Y$. Which must be true? [ ]

A.Problem X is polynomial-time reducible to problem Y

B. Problem Y is polynomial-time reducible to problem X.

C. Problems X and Y are polynomial-time equivalent.

D. All of the above

21. Suppose $X \leq_p Y$ and $Y \leq_p Z$. Which must be true? [ ]

A. $Y \leq_p X$. B. $Z \leq_p Y$. C. $X \leq_p Z$. D. All of the above

22. Suppose $X \leq_p Y$ and $Y \leq_p Z$ and $Z \leq_p X$. Which must be true? [ ]

A. $Y \leq_p X$. B. $Z \leq_p Y$. C. $X \leq_p Z$. D. All of the above

23. Which of the following statements are currently known to be true? [ ]

A. P=NP B. NP$\subseteq$P C. P$\subseteq$NP. D. All of the above

24. The most important unresolved question in computer science is: [ ]

A. Does P = NP?

B. Why does a window crash so often?

C. Why isn't C++ named ++C, since we wish to use this language after the extra features were added to C?

D. How many years will I need to work before my total career salary equals Bill Gates' hourly income?

25. The Satisfiability, Clique, Independent Set, and Hamiltonian Cycle problems are known to be: [ ]

A. Members of the class P. B. Members of the class NP–complete.

C. Both of the above. D. None of the above.

26. The Minimum Spanning Tree, Sorting, and Matrix Chain Multiplication problems are known to be: [ ]

A. Members of the class P. B. Members of the class NP–complete.

C. Both of the above. D. None of the above.

27. The Graph Isomorphism and Prime Number problems are known to be: [ ]

A. Members of the class P. B. Members of the class NP–complete.

C. Both of the above. D. None of the above.

28. Suppose problem X is in class P, problem Y is in class NP, and $X \equiv_p Y$. Which must be true? [ ]

A.Problem Y is in class P. B.Problem Y is NP–complete.

C.Both of the above D.None of the above.

29. Suppose problem X is NP-complete, problem Y is in class NP, and X $\equiv_p$ Y. Which must be true? [ ]

A.Problem Y is in class P. B.Problem Y is NP–complete.

C.Both of the above D.None of the above.

30. Suppose problem X is in class P, problem Y is in class NP, and X $\leq_p$ Y. Which must be true? [ ]

A.Problem Y is in class P. B.Problem Y is NP–complete.

C.Both of the above D.None of the above.

31. Suppose problem X is NP-complete, problem Y is in class NP, and X $\leq_p$ Y. Which must be true? [ ]

A.Problem Y is in class P. B.Problem Y is NP–complete.

C.Both of the above D.None of the above.

32. Suppose problem X is in class NP, problem Y is in class P, and X $\leq_p$ Y. Which must be true? [ ]

A.Problem Y is in class P. B.Problem Y is NP–complete.

C.Both of the above D.None of the above.

33. Suppose problem X is in class NP, problem Y is NP-complete, and X $\leq_p$ Y. Which must be true? [ ]

A.Problem Y is in class P. B.Problem Y is NP–complete.

C.Both of the above D.None of the above.

34. Suppose problem X is NP-complete, problem Y is in class P, and X $\leq_p$ Y. Which must be true? [ ]

A.Problem X is in class P. B.Problem Y is NP–complete.

C.P = NP D.All of the above.

35. If you could prove, for some problem X, that problem X is NP-complete and also problem X is in class P, then: [ ]

A. Dr. Borie would give you an A+ in CS 470 regardless of your grades on all these quizzes.

B.You would be ready to write your dissertation and claim your PhD in computer science.

C. You would receive job offers to join the computer science faculties at MIT and Stanford.

D. All of the above.

36. Under what condition any set A will be a subset of B? [ ]

A. if all elements of set B are also present in set A

B. if all elements of set A are also present in set B

C. if A contains more elements than B

D. if B contains more elements than A

37. What is a subset sum problem? [ ]

A. finding a subset of a set that has sum of elements equal to a given number

B. checking for the presence of a subset that has sum of elements equal to a given number and printing true or false based on the result

C. finding the sum of elements present in a set

D. finding the sum of all the subsets of a set

38. Which of the following is true about the time complexity of the recursive solution of the subset sum problem? [ ]

A. It has an exponential time complexity B. It has a linear time complexity

C. It has a logarithmic time complexity D. it has a time complexity of O(n2)

39. What is the worst case time complexity of dynamic programming solution of the subset sum problem(sum=given subset sum)? [ ]

A. O (n) B. O (sum) C. O (n2) D. O (sum*n)

40. Subset sum problem is an example of NP-complete problem. [ ]

A.True B.False C.A&B D.None

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BIT BANK ANSWERS

UNIT-1

1	**C**	11	**D**	21	**A**	31	**C**
2	**B**	12	**B**	22	**C**	32	**D**
3	**C**	13	**A**	23	**C**	33	**A**
4	**C**	14	**C**	24	**B**	34	**C**
5	**D**	15	**C**	25	**A**	35	**C**
6	**B**	16	**A**	26	**A**	36	**C**
7	**C**	17	**C**	27	**C**	37	**B**
8	**A**	18	**D**	28	**A**	38	**D**
9	**C**	19	**A**	29	**C**	39	**A**
10	**C**	20	**A**	30	**C**	40	**B**

UNIT-2

1	**C**	11	**C**	21	**A**	31	**C**
2	**A**	12	**B**	22	**C**	32	**A**
3	**B**	13	**B**	23	**C**	33	**D**
4	**B**	14	**C**	24	**C**	34	**A**
5	**B**	15	**B**	25	**D**	35	**C**
6	**D**	16	**A**	26	**B**	36	**A**
7	**B**	17	**B**	27	**C**	37	**A**
8	**C**	18	**A**	28	**B**	38	**B**
9	**C**	19	**B**	29	**C**	39	**D**
10	**B**	20	**D**	30	**C**	40	**B**

UNIT-3

1	**A**	11	**A**	21	**B**	31	**B**
2	**C**	12	**C**	22	**D**	32	**A**
3	**B**	13	**D**	23	**A**	33	**B**
4	**B**	14	**B**	24	**B**	34	**A**
5	**A**	15	**C**	25	**C**	35	**A**
6	**A**	16	**A**	26	**B**	36	**B**
7	**D**	17	**B**	27	**A**	37	**B**
8	**D**	18	**C**	28	**A**	38	**C**
9	**A**	19	**B**	29	**A**	39	**B**
10	**B**	20	**D**	30	**A**	40	**A**

UNIT-4

1	**D**	11	**B**	21	**A**	31	**D**
2	**A**	12	**A**	22	**C**	32	**B**
3	**B**	13	**C**	23	**C**	33	**D**
4	**B**	14	**B**	24	**A**	34	**C**
5	**A**	15	**A**	25	**B**	35	**A**

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6	**B**	16	**C**	26	**B**	36	**D**
7	**C**	17	**A**	27	**B**	37	**A**
8	**D**	18	**D**	28	**D**	38	**B**
9	**A**	19	**B**	29	**B**	39	**A**
10	**D**	20	**D**	30	**C**	40	**A**

UNIT-5

1	**A**	11	**B**	21	**C**	31	**B**
2	**B**	12	**C**	22	**D**	32	**A**
3	**A**	13	**B**	23	**C**	33	**D**
4	**A**	14	**D**	24	**A**	34	**D**
5	**B**	15	**A**	25	**B**	35	**D**
6	**D**	16	**A**	26	**A**	36	**B**
7	**A**	17	**C**	27	**D**	37	**B**
8	**B**	18	**D**	28	**A**	38	**A**
9	**B**	19	**A**	29	**B**	39	**D**
10	**A**	20	**D**	30	**D**	40	**A**