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CORRECT ANSWER SOLVED BY HADI
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(Final Term Past Paper)

MADE AND SOLVED BY TEAM HADI

WARNING: Team HADI is not responsible for any mistake or wrong answer. All students reading and using this document may check and confirm the answers at their own.

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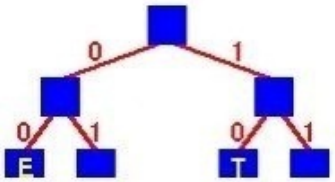
Best of luck!

PAST PAPER

Question No : 1 of 52 **Marks: 1 (Budgeted Time 1 Min)**

Consider the following Huffman Tree



Answer (Please select your correct option)

- 10 00 010

correct answer
solved by hadi

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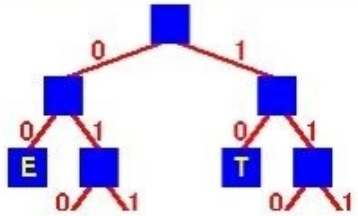
- 011 00 010
- 10 00 110
- 11 10 110

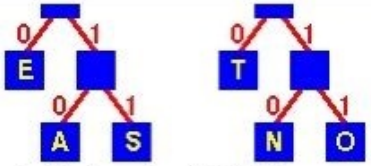
Question No : 1 of 52 Marks: 1 (Budgeted Time 1 Min)



Answer (Please select your correct option)

- 10 00 010
- 011 00 010
- 10 00 110
- 11 10 110

Question No : 1 of 52 **Marks: 1 (Budgeted Time 1 Min)**

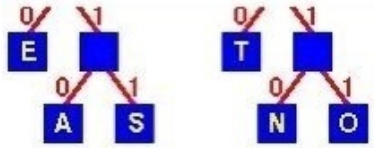


The binary code for the string "**TEA**" is

Answer (Please select your correct option)

- 10 00 010
- 011 00 010
- 10 00 110
- 11 10 110

Question No : 1 of 52 Marks: 1 (Budgeted Time 1 Min)



The binary code for the string "**TEA**" is

Answer (Please select your correct option)

- 10 00 010 ⇦ correct answer solved by hadi
- 011 00 010
- 10 00 110
- 11 10 110

Question No : 2 of 52 **Marks: 1 (Budgeted Time 1 Min)**

What is generally true of Adjacency List and Adjacency Matrix representations of graphs?

Answer (Please select your correct option)

- *Lists* require less space than *matrices* but take longer to find the weight of an edge (v1,v2) ⇦ correct answer solved by hadi
- *Lists* require less space than *matrices* and they are faster to find the weight of an edge (v1,v2)
- *Lists* require more space than *matrices* and they take longer to find the weight of an edge (v1,v2)
- *Lists* require more space than *matrices* but are faster to find the weight of an edge (v1,v2)

Question No : 3 of 52 **Marks: 1 (Budgeted Time 1 Min)**

If a graph has v vertices and e edges then to obtain a spanning tree we have to delete

Answer (Please select your correct option)

- v edges.
- v – e + 5 edges
- v + e edges.
- None of these

correct answer
solved by hadi

Question No : 4 of 52 Marks: 1 (Budgeted Time 1 Min)

The Huffman algorithm finds a (n) _____ solution.

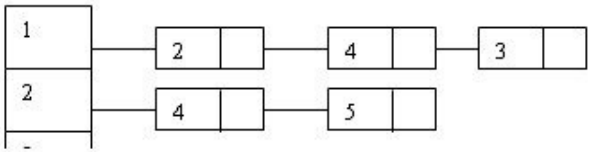
Answer (Please select your correct option)

- Optimal 
- Non-optimal
- Exponential
- Polynomial

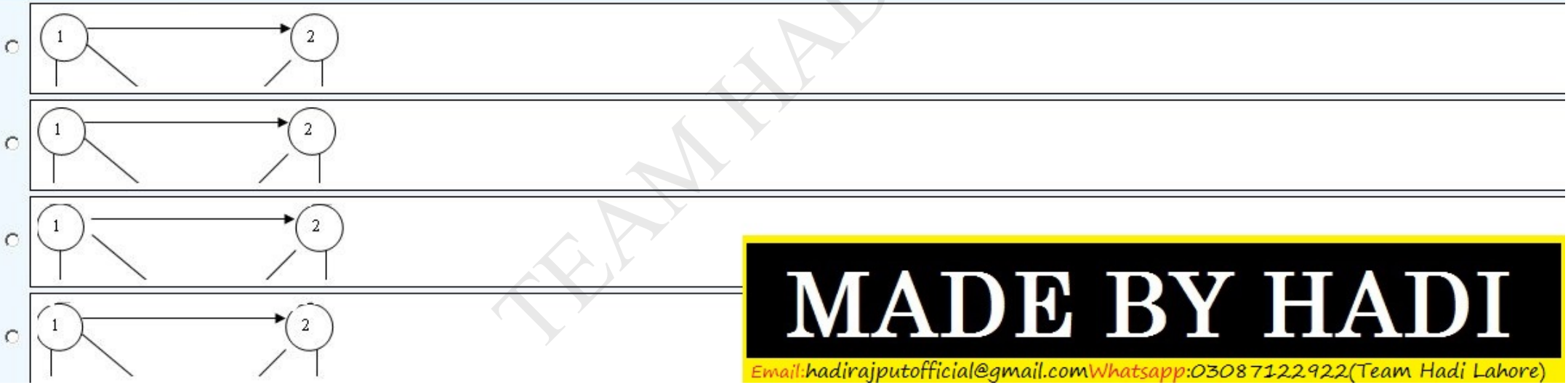
correct answer
solved by hadi

Question No : 5 of 52 **Marks: 1 (Budgeted Time 1 Min)**

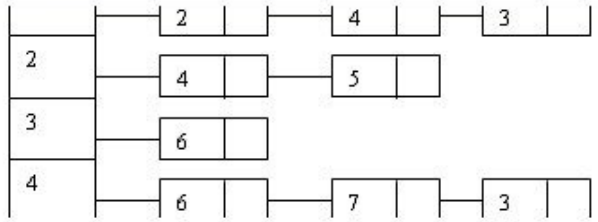
Consider the following adjacency list:



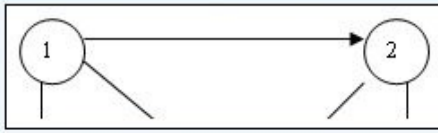
Answer (Please select your correct option)

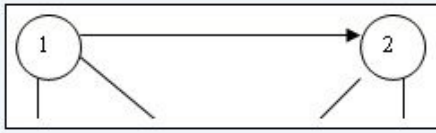


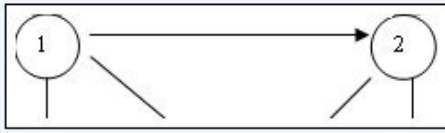
Question No : 5 of 52 Marks: 1 (Budgeted Time 1 Min)



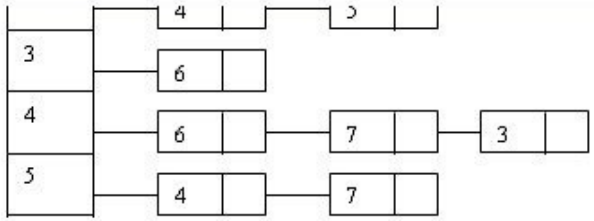
Answer (Please select your correct option)



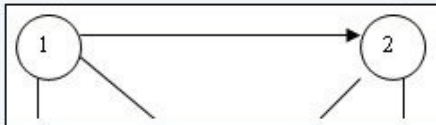




Question No : 5 of 52 **Marks: 1 (Budgeted Time 1 Min)**

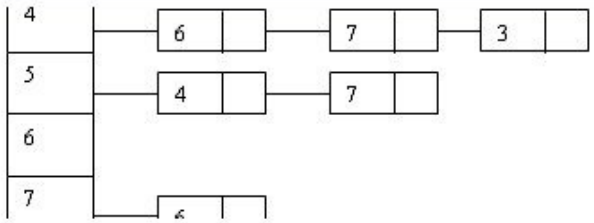


Answer (Please select your correct option)

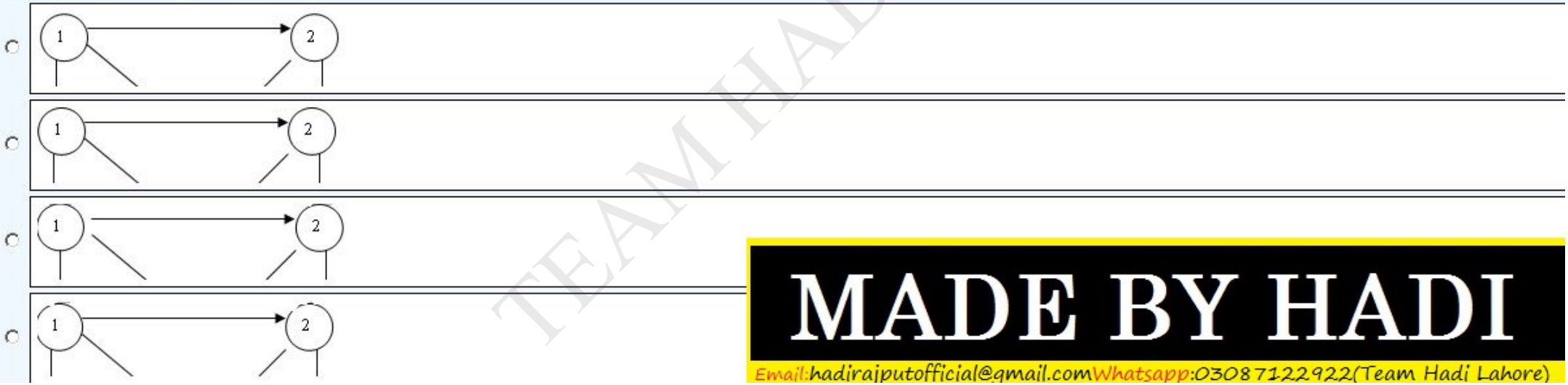


correct answer
solved by hadi

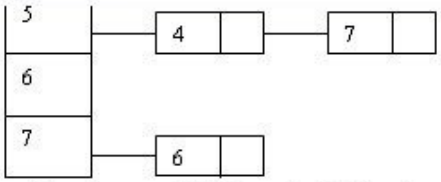
Question No : 5 of 52 Marks: 1 (Budgeted Time 1 Min)



Answer (Please select your correct option)

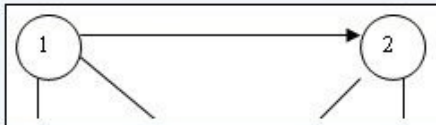


Question No : 5 of 52 Marks: 1 (Budgeted Time 1 Min)



Which of the following graph(s) describe(s) the above adjacency list?

Answer (Please select your correct option)



correct answer solved by hadi

Question No : 6 of 52 **Marks: 1 (Budgeted Time 1 Min)**

_____ is a graphical representation of an algorithm

Answer (Please select your correct option)

- Σ notation
- Θ notation
- Flowchart ⇦ correct answer
- Asymptotic notation

Question No : 7 of 52 **Marks: 1 (Budgeted Time 1 Min)**

Identify the maximal points in given set, according to 2-D maxima (the points that are NOT dominated by other points).
$\{(2,5),(4,4),(4,11),(5,1),(7,7),(7,13),(9,10),(11,5),(12,12),(13,3),(14,10),(15,7)\}$

Answer (Please select your correct option)

- $\{(7,13),(12,12),(14,10),(15,7)\}$ correct answer solved by hadi not confirm
- $\{(7,7),(7,13),(9,10),(11,5),(14,10)\}$
- $\{(2,5),(4,4),(4,11),(5,1),(14,10)\}$
- $\{(4,4),(4,11),(7,13),(9,10)(14,10)\}$

Question No : 8 of 52 **Marks: 1 (Budgeted Time 1 Min)**

What will be result of the following recurrence relation?

$$T(n) = \begin{cases} 4 & \text{if } n = 1 \\ T(n/5) + 3n^2 & \text{if } n \text{ is divisible by } 5 \end{cases}$$

Then T(5) is

Answer (Please select your correct option)

- 25
- 75
- 79
- 70

Question No : 9 of 52 **Marks: 1 (Budgeted Time 1 Min)**

When we call heapify then at each level the comparison performed takes time

Answer (Please select your correct option)

- It will take Θ (1)
- Time will vary according to the nature of input data
- It can not be predicted
- It will take Θ (log n)

correct answer
solved by hadi

Question No : 10 of 52 **Marks: 1 (Budgeted Time 1 Min)**

Who invented Quick sort procedure?

Answer (Please select your correct option)

- Hoare ⇦ correct answer solved by hadi
- Sedgewick
- Mellroy
- Coreman

Question No : 11 of 52 **Marks: 1 (Budgeted Time 1 Min)**

The main shortcoming of counting sort is that it is useful for

Answer (Please select your correct option)

- Small Integers

correct answer
solved by hadi

- Small characters
- Floats
- None of these

Question No : 12 of 52 **Marks: 1 (Budgeted Time 1 Min)**

A product of matrices is _____ if it is either single matrix or the product of two matrix products, surrounded by parentheses.

Answer (Please select your correct option)

- Fully parenthesized
- Partially parenthesized
- Not parenthesized
- None of the options

Question No : 13 of 52 **Marks: 1 (Budgeted Time 1 Min)**

Maximum number of edges in a Directed Graph may be

Answer (Please select your correct option)

- V
- 2V
- Approximatly $|V^2|$
- v/2

correct answer
solved by hadi

Question No : 14 of 52 **Marks: 1 (Budgeted Time 1 Min)**

If we encode and compress text using ASCII standard each character is represented by

Answer (Please select your correct option)

- Fixed length codeword of 4 bits
- Variable length codeword up to 4 bits
- Variable length codeword up to 8 bits
- Fixed length codeword of 8 bits.

correct answer
solved by hadi

Question No : 15 of 52 Marks: 1 (Budgeted Time 1 Min)

The Huffman Coding uses

Answer (Please select your correct option)

- Prefix property that code words are not matched at ends
- No prefix property it has its own method to store the codes
- Prefix property that no code word is prefix of any other code
- Prefix property that no code words at same level of tree are prefix at other levels

Question No : 16 of 52 **Marks: 1 (Budgeted Time 1 Min)**

In directed graphs the cardinality of edges |E| =

Answer (Please select your correct option)

- Sum of out-degrees of all the vertices
- Sum of in-degrees of all the vertices
- First both are true ⇦
- There is no relation between degree of vertices and no of edges

correct answer
solved by hadi

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Question No : 17 of 52 **Marks: 1 (Budgeted Time 1 Min)**

A Hamiltonian cycle is a cycle

Answer (Please select your correct option)

- that visits every vertex in the graph exactly once

correct answer
solved by hadi

- that visits both vertex and edge exactly once
- that visits all vertices without any constraint
- that visits every edge in the graph exactly once

Question No : 18 of 52 Marks: 1 (Budgeted Time 1 Min)

In generic graph traversal algorithm we

Answer (Please select your correct option)

- put vertices in the bag data structure
- put edges in the bag data structure
- put edges in stack data structure
- put vertices in the stack data structure

correct answer
solved by hadi

Question No : 19 of 52 Marks: 1 (Budgeted Time 1 Min)

In time stamp traversal we can calculate

Answer (Please select your correct option)

- whether the graph has Cycles ⇦ correct answer solved by hadi
- total number of cycles on the bases of forward edges
- total number of cycles on the bases if back edges
- total no of paths of certain length

Question No : 20 of 52 **Marks: 1 (Budgeted Time 1 Min)**

Precedence constraint graph is

Answer (Please select your correct option)

- non acyclic directed graph
- acyclic undirected graph
- non acyclic undirected graph
- acyclic directed graph ⇦

correct answer
solved by hadi

Question No : 21 of 52 **Marks: 1 (Budgeted Time 1 Min)**

In Prim's algorithm, the additional information maintained by the algorithm is

Answer (Please select your correct option)

- the length of the shortest path from vertex v to the vertex u
- the length of the shortest edge from vertex *v* to points already in the tree
- the dynamic programming rules
- the information about all adjacent vertices

correct answer
solved by hadi

not sure

Question No : 22 of 52 **Marks: 1 (Budgeted Time 1 Min)**

Bellman Ford algorithm is for the

Answer (Please select your correct option)

- single source shortest path finding problem and does allow negative cycles
- single source shortest path finding problem and does allow negative edges and negative cycles
- multiple-source shortest path finding problem and does allow negative edges ⇦ correct answer solved by hadi
- single source shortest path finding problem and does allow negative edges

Question No : 23 of 52 **Marks: 1 (Budgeted Time 1 Min)**

Which of the following is not true about Dijkstra's algorithm?

Answer (Please select your correct option)

- The length of the shortest path to the start vertex is always zero
- It can find the shortest paths to all other vertices in the same worst case time that it needs to find the shortest path to a single vertex ⇦ correct answer solved by hadi
- It will work on any weighted graph with positive weights
- The running time of Bellman - Ford Algorithm is greater than Dijkstra's algorithm

Question No : 24 of 52 **Marks: 1 (Budgeted Time 1 Min)**

Kruskal's Algorithm is used for

Answer (Please select your correct option)

- calculating shortest path problem
- calculating Minimum spanning tree ⇦ correct answer solved by hadi
- shortest and Minimum Spanning tree both can be calculated by it
- single source shortest path problems

Question No : 25 of 52 **Marks: 1 (Budgeted Time 1 Min)**

Dijkstra's algorithm is used for

Answer (Please select your correct option)

- calculating multiple source shortest path problems
- calculating Minimum spanning tree
- shortest and Minimum Spanning tree both can be calculated by it
- single source shortest path problems ⇦ correct answer solved by hadi

Question No : 26 of 52 **Marks: 1 (Budgeted Time 1 Min)**

Kruskal's Algorithm has time complexity

Answer (Please select your correct option)

- overall Ø (E log E) and for sparse graph Ø (E log V) 
- overall Ø (EV) and for sparse graph Ø (V^2)
- overall Ø (V log E)
- overall Ø (E log V) for sparse graph Ø (V log E)

correct answer
solved by hadi

Question No : 27 of 52 **Marks: 1 (Budgeted Time 1 Min)**

Bellman Ford algorithm applies relaxation to every

Answer (Please select your correct option)

- edge of the graph and repeats exactly E-1 times
- edge but use the back edges for the completion
- edge of the graph and repeats exactly v-1 times

correct answer

- vertex of the graph and repeats exactly E-1 times

Question No : 28 of 52 **Marks: 1 (Budgeted Time 1 Min)**

Complexity wise the comparison based merge and quick sort algorithms fall in

Answer (Please select your correct option)

- Deterministic Polynomial class
- Non-Deterministic Polynomial class
- Quick sort in P class and Merge sort in NP class
- Quick sort in NP class and Merge sort in P class

Right ,,, by concept

Question No : 29 of 52 Marks: 1 (Budgeted Time 1 Min)

In NP-problems "NP" represents

Answer (Please select your correct option)

- Non-deterministic Polynomials
- Null-polynomials
- Negative Polynomials
- Non-polynomials

correct answer
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Question No : 30 of 52 **Marks: 1 (Budgeted Time 1 Min)**

Floyd-Warshall algorithm dates back to the early _____.

Answer (Please select your correct option)

- 70's
- 90's
- 60's 
- 50's

correct answer
solved by hadi

Question No : 31 of 52 **Marks: 1 (Budgeted Time 1 Min)**

Space used by Floyd-Warshall algorithm is

Answer (Please select your correct option)

- $\Theta(n^4)$
- $\Theta(n^3)$
- $\Theta(n^2)$ ⇦ correct answer solved by hadi
- $\Theta(2^n)$

Question No : 32 of 52 **Marks: 1 (Budgeted Time 1 Min)**

In the clique cover problem, for two vertices to be in the same group, they must be _____each other.

Answer (Please select your correct option)

- Apart from
- Far from
- Near to
- Adjacent to

correct answer
solved by hadi

Question No : 33 of 52 **Marks: 1 (Budgeted Time 1 Min)**

Polynomial time certificates

Answer (Please select your correct option)

- indicate there are polynomial solutions for NP –class problems
- are the tools to solve the problems in P class in P time
- use in reductions to verify for the NP-problems classes
- use in Polynomial classes to interchange the problems

Question No : 34 of 52 **Marks: 1 (Budgeted Time 1 Min)**

What is the solution to the recurrence T(n) = T(n/2)+n?

Answer (Please select your correct option)

- $O(\log n)$
- $O(n)$ ⇦ correct answer solved by hadi
- $O(n\log n)$
- $O(n^2)$

Question No : 35 of 52 **Marks: 1 (Budgeted Time 1 Min)**

If a pseudo code is memory wise efficient then

Answer (Please select your correct option)

- Obviously it will be time wise efficient as well.
- Memory wise efficient codes cannot be time wise efficient
- Time wise efficient code can be memory wise efficient but vise versa is not true.
- It may be memory wise efficient but not necessary ⇦ correct answer solved by hadi

Question No : 36 of 52 **Marks: 1 (Budgeted Time 1 Min)**

Merge sort makes two recursive calls. Which statement is true after these recursive calls finish, but before the merge step?

Answer (Please select your correct option)

- The array elements form a heap
- Elements in each half of the array are sorted amongst themselves
- Elements in the first half of the array are less than or equal to elements in the second half of the array
- None of the given options

correct answer
solved by hadi

Question No : 37 of 52 **Marks: 1 (Budgeted Time 1 Min)**

Search techniques of various algorithms look at____

Answer (Please select your correct option)

- Many possible solutions

correct answer
solved by hadi

- Maximum 2 possible solutions
- Minimum 2 possible solutions
- Sorting solutions

Question No : 38 of 52 Marks: 1 (Budgeted Time 1 Min)

Using ASCII standard each character is represented by a fixed length codeword of _____

Answer (Please select your correct option)

- 9 bits
- 16 bits
- 8 bits
- 32 bits

correct answer
solved by hadi

Question No : 39 of 52 **Marks: 1 (Budgeted Time 1 Min)**

The Huffman encoding algorithm is a _____

Answer (Please select your correct option)

- Dynamic and greedy algorithm
- Divide and conquer and greedy algorithm
- Geedy algorithm.
- Dynamic programming algorithm

correct answer
solved by hadi

Question No : 40 of 52 **Marks: 1 (Budgeted Time 1 Min)**

Breadth first search is shortest path algorithm that works

Answer (Please select your correct option)

- on un-weighted graphs ⇦ correct answer solved by hadi
- on weighted graphs
- on both weighted and un-weighted graphs
- BFS cannot be used for shortest path problems

Correct Answer solved by hadi

Question No : 41 of 52 **Marks: 2 (Budgeted Time 4 Min)**

What is heap and heap order?

Answer (Please click here to Add Answer)

Question No : 42 of 52 Marks: 2 (Budgeted Time 4 Min)

Define free tree.

Answer (Please click here to Add Answer)

Question No : 43 of 52 **Marks: 2 (Budgeted Time 4 Min)**

The following adjacency matrix represents a graph that consists of four vertices labeled 0, 1, 2 and 3. The entries in the matrix indicate edge weights.

	0	**1**	**2**	**3**
0	0	1	0	3
1	2	0	4	0
2	0	1	0	1
3	2	0	0	0

Answer the following question:

Answer (Please click here to Add Answer)

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Question No : 43 of 52 **Marks: 2 (Budgeted Time 4 Min)**

	0	1	2	3
0	0	1	0	3
1	2	0	4	0
2	0	1	0	1
3	2	0	0	0

Answer the following question:

Can an adjacency matrix for a directed graph ever *not* be square in shape? Why or why not?

Answer (Please click here to Add Answer)

Question No : 44 of 52 Marks: 2 (Budgeted Time 4 Min)

Where clique cover problem arises?

Answer (Please click here to Add Answer)

Question No : 45 of 52 **Marks: 3 (Budgeted Time 6 Min)**

Consider a digraph G = (V, E) and any DFS forest for G. Prove that G has a cycle if and only if the DFS forest has a back edge.

Answer (Please click here to Add Answer)

Question No : 46 of 52 **Marks: 3 (Budgeted Time 6 Min)**

Describe three asymptotic notations.

Answer (Please click here to Add Answer)

Question No : 47 of 52 **Marks: 3 (Budgeted Time 6 Min)**

Briefly discuss at least three variants of the shortest path problem.

Answer (Please click here to Add Answer)

Question No : 48 of 52 **Marks: 3 (Budgeted Time 6 Min)**

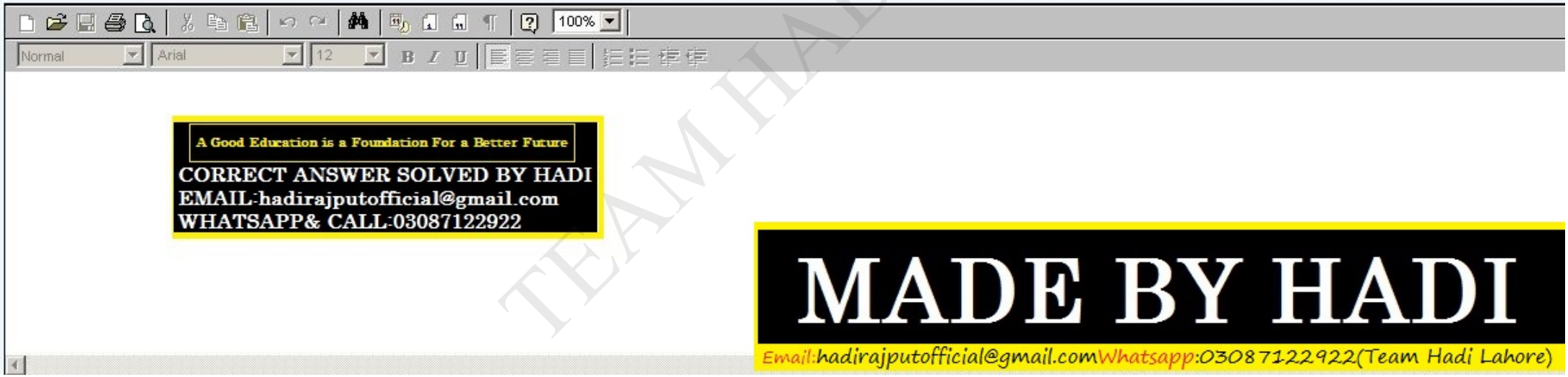
What do you mean by polynomial time algorithm? Explain what kind of problem can be solved by using polynomial time algorithm?

Answer (Please click here to Add Answer)

Question No : 49 of 52 Marks: 5 (Budgeted Time 10 Min)

Suppose you could reduce an NP-complete problem to a polynomial time problem in polynomial time. What would be the consequence?

Answer (Please click here to Add Answer)

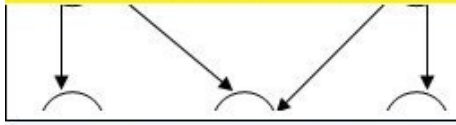


Question No : 50 of 52 **Marks: 5 (Budgeted Time 10 Min)**

According to Dijkstra's Algorithm, write the pseudo code to relax a vertex.

Answer (Please click here to Add Answer)

Marks: 5 (Budgeted Time 10 Min)



Answer (Please click here to Add Answer)

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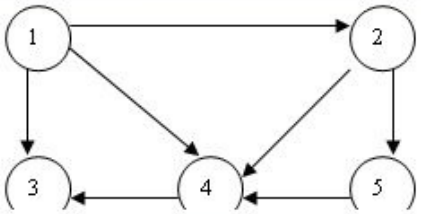
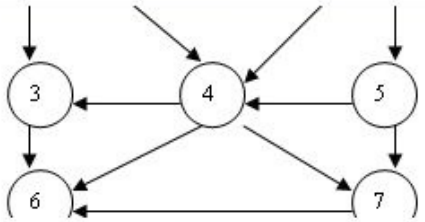
Question No : 51 of 52 Marks: 5 (Budgeted Time 10 Min)



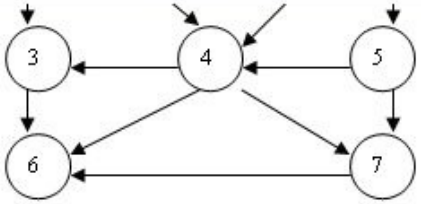
Answer (Please click here to Add Answer)

Question No : 51 of 52 Marks: 5 (Budgeted Time 10 Min)



Answer (Please click here to Add Answer)

Question No : 51 of 52 Marks: 5 (Budgeted Time 10 Min)



Answer (Please click here to Add Answer)

Question No : 52 of 52 **Marks: 5 (Budgeted Time 10 Min)**

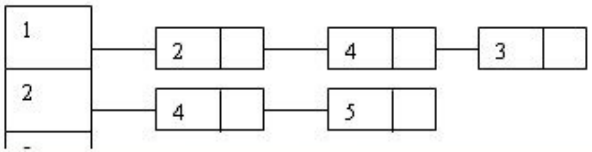
Draw the final **Max-Heap** structure for the following array,

`50,31,45,30,2,7,40,12,28,1`

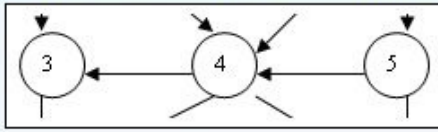
You can show the final result (tree) only.

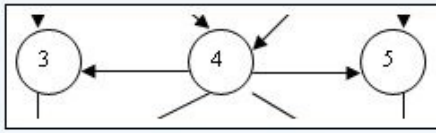
Answer (Please click here to Add Answer)

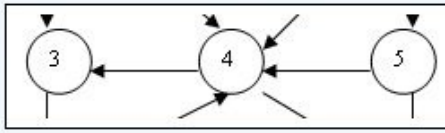
Consider the following adjacency list:

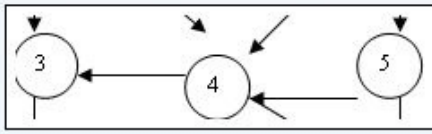


Answer (Please select your correct option)



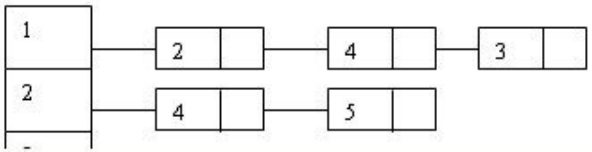




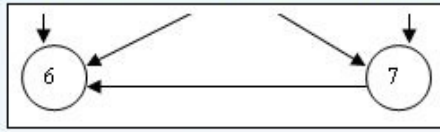


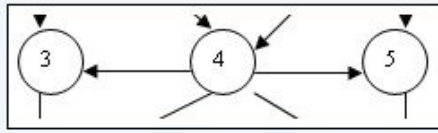
Start Time: 7:41 AM

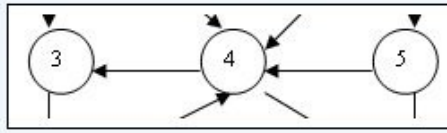
Consider the following adjacency list:

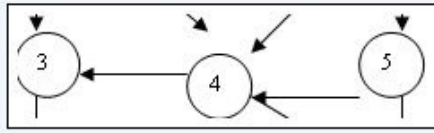


Answer (Please select your correct option)



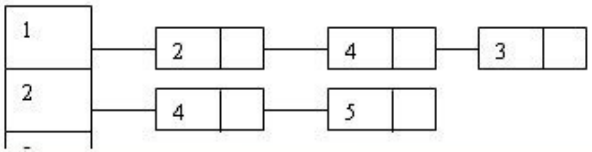




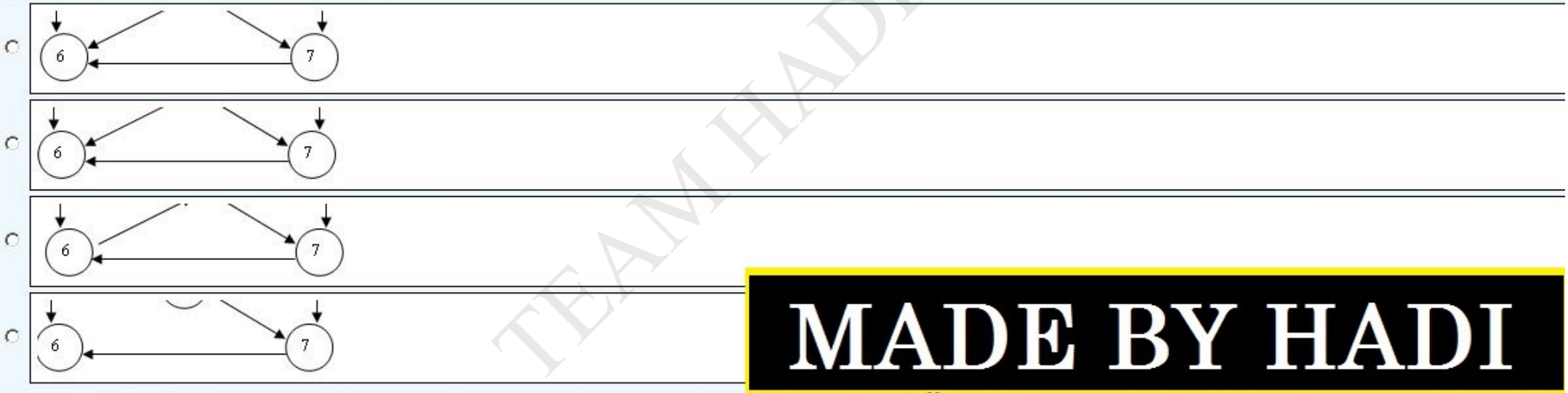


Start Time: 7:41 AM

Consider the following adjacency list:



Answer (Please select your correct option)



Start Time: 7:41 AM