Complexity of following Pseudocode is:

```
for(i=1;i<=n;i++)

for(j=1;j<=n;j=2*j)

for(k=n;k>=1;k=k/2)

x=y+z;
```

n(logn)^2

n^2logn

nlogn

log n

Ans - A

Instructions that executes one after the another, one operation at a time is called

Sequential algorithm

Parallel Algorithm

Grid Computing

All of the above

Ans - A

Directed graph is also called as

Digraph

Edge

Adjacent

Loop

Ans -A

Find Complexity of Following Pseudocode

```
for(i=0;i<n;i++)

for(i=0;i<n^2;i++)

for(i=0;i<n^3;i++)

print(i)
```

n^3

n^2

n

None

Ans - D

lgorithm that can executes operation concurrently is called

Sequential algorithm

Parallel Algorithm

Forest

All of the above

Ans - B

Complexity of following Pseudocode is:

```
for(i=1;i<=n;i++)
    for(j=1;j<=n;j=2*j)
        for(k=n;k>=1;k=k/2)
            x=y+z;
```

n(logn)^2

n^2logn

nlogn

log n

Ans - A

The Average case occurs in linear search algorithm ……….

when item is somewhere in the middle of the array

when item is not the array at all

when item is the last element in the array

when array is empty

Ans - A

Find Complexity of Following Pseudocode

```
for(i=0;i<n;i++)
    for(j=0;j<n^2;i++)
        for(k=0;k<n^3;i++)
            print(i)
```

n^6

n^3

n

None

Ans - B

What is the basic principle in Rabin Karp algorithm?

Hashing

Sorting

Dynamic Programming

dividing the problem

Ans - A

Find worst case complexity for the following

```
main()

{

for(j= 1, j<=n; j++)

for ( i=1; i<=n^2; i++)

for (k=1; k <=n^2; k++)

x=y+z

}
```

n

n^2

n^3

n^5

Ans - A

n algorithm performs lesser number of operations when the size of input is small, but performs more operations when the size of input gets larger. State if the statement is True or False or Maybe

TRUE

FALSE

Maybe

None of the abov

Ans - A

What is a Rabin and Karp Algorithm?

String Matching Algorithm

Shortest Path Algorithm

Minimum spanning tree Algorithm

Approximation Algorithm

Ans - A

The big-Omega notation for f(x) = 2x4 + x2 – 4 is?

x2

x3

x

x4

Ans - D

What is the runtime efficiency of using brute force technique for the convex Hull Problem

n

n^3

n^5

None

Ans - B

The maximum time required to perform a successful sequential search for an element in an array A(1 : n) is given by

n

n(n+1)/2

log n

n^2

Ans - B

The big-O notation for f(x) = 5logx is?

1

x

x2

x3

Ans - B

A best case for successful sequential search for an element in an array A(1 : n) requires how much time?

1

n

n^2

None

Ans - A maybe

What is the runtime efficiency of using brute force technique for the Travelling Sales Person Problem

n

(n-1)!

n^2

None

Ans - B

Which of the given options provides the increasing order of asymptotic complexity of functions f1, f2, f3 and f4?

f1(n) = 2^n

f2(n) = n^(3/2)

f3(n) = nLogn

f4(n) = n^(Logn)

f3, f2, f4, f1

f3, f2, f1, f4

f2, f3, f1, f4

f2, f3, f4, f1

Ans - A

In a modified merge sort, the input array is splitted at a position one-third of the length(N) of the array. Which of the following is the tightest upper bound on time complexity of modified Merge Sort.

N(logN base 3)

N(logN base 2/3)

N(logN base 1/3)

N(logN base 3/2)

Ans - D

Which of the following statements concerning sorting algorithms based on comparison is false?

The minimum possible time complexity of a comparison based sorting algorithm is O(nLogn) for a random input array

Any comparison based sorting algorithm can be made stable by using position as a criteria when two elements are compared

Counting Sort is not a comparison based sorting algorithm

Heap Sort is not a comparison based sorting algorithm.

Ans - D

The maximum time required to perform a successful sequential search for an element in an array A(1 : n) is given by

n

n^2

n^3

None

Ans – A

Given an array that isn’t ordered.Every element in the array is at most k distance from its place in the sorted array, where k is a positive integer less than the array’s size.What sorting algorithm can be simply adapted to sort this array, and what is the time complexity that can be achieved?

Insertion Sort with time complexity O(kn)

Heap Sort with time complexity O(nLogk)

Quick Sort with time complexity O(kLogk)

Merge Sort with time complexity O(kLogk)

Ans – B

Best case running time complexity of bubble sort is

N^2

NlogN

N

N(logN)^2

Ans – C

If the expected number of valid shifts is small and modulus is larger than the length of pattern what is the matching time of Rabin Karp Algorithm?

Theta(m

Big-Oh(n+m)

Theta(n-m)

Big-Oh(n)

Ans – B

Which algorithm is used to solve a maximum flow problem

Prim's algorithm

Kruskal's algorithm

Dijkstra's algorithm

Ford-fulkerson algorithm

Ans – D

What is the basic operation of closest pair algorithm using brute force technique?

Radius

Euclidean distance

Area

Manhattan distance

Ans -B

What is the worst case time complexity of KMP algorithm for pattern searching (m = length of text, n = length of pattern)?

O(n)

O(n*m)

O(m)

O(log n)

Ans – C

Which of the below mentioned algorithms does not use Dynamic Programming for finding out the optimal solution .

Prim’s Minimum Spanning Tree

0-1 Knapsack problem
0-2

Optimal Binary Search Tree

Matrix Chain Multiplication

Ans – A

Backtracking algorithm is implemented by constructing a tree of choice s called as?

State-space tree

State-chart tree

Node tree

Backtracking tree

Ans – A

For implementing a LIFO branch and bound strategy, which of the following data structure is most suitable ?

a) Stack

b) Queue

c) Array linked list

Ans - A

For implementing a FIFO branch and bound strategy, Which of the following data structure is used?

a) Stackm
b) Queue
c) Array
d) Linked list

Ans – B

Which of the following is true

a) Backtracking is more efficient than dynamic Programming b) branch and bound is not suitable where a greedy algorithm

Not applicable

b) Branch and bound divides a problem into at least 2 new

Restricted sub problems d) backtracking divides a problem into at least 2 new restricted sub problems

Ans – C

The optimization problem of finding least-cost cyclic route all node of a weighted graph is

NP

NP-Complete

P

NP-hard

Ans – D

Which of the following is/are property/properties of a dynamic programming problem?

Optimal substructure

Overlapping subproblems

Greedy approach

Both optimal substructure and overlapping subproblems

Ans – D

Which of the following problem set can be efficiently solved by backtracking approach but cannot be solved by

Exhaustive search algorithms a) Numerical problems

c) Exhaustive search

d) Combinatorial problems d) Graph coloring problems

Ans – A

Each optimization problem must have certain parameters called

Linear variables

Dummy variables

Design variables

Ans – C

Consider the matrices P, Q, R and S which are 20 x 15, 15 x 30, 30 x 5 and 5 x 40 matrices respectively. What is the minimum number of multiplications required to multiply the four matrices?

7750

6050

7500

12000

Ans – A

The choice of polynomial class has led to the development of an extensive theory called ____

Time complexity

Computational complexity

Problem complexity

Decision complexity

Ans – B

Let S be an NP-complete problem and Q and R be two other problems not known to be in NP. Q is polynomial time reducible to S and S is polynomial-time reducible to R. Which one of the following statements is true?

R is NP-complete

R is NP-hard

Q is NP-complete

Q is NP-hard

Ans – B

Which statement about NP-Complete and NP-Hard is correct?

The first problem that was proved as NP-complete was the circuit satisfiability problem.

If we want to prove that a problem X is NP-Hard, we take a known NP-Hard problem Y and reduce Y to X

NP-complete is a subset of NP Hard

All of the above

Ans – D

The problem 2-Sat is in

P

NP

NP-complete

NP-hard

Ans – C

The directions in which queens attack each other in n-queens problem are?

1

2

3

4

Ans – C

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

O(n)

O(sum)

O(n2)

O(sum*n)

Ans – D

Under what condition any set X will be a subset of Y?

If all elements of set Y are also present in set X

If X contains more elements than Y

If all elements of set X are also present in set Y

If Y contains more elements than X

Ans – Maybe C

Of the following given options, which one of the following is a correct option that provides an optimal solution for 4-queens problem?

(2,3,1,4)

(4,3,2,1)

(3,1,4,2)

(4,2,3,1)

Ans – A

Which is the problem of finding a path in a graph that visits every vertex exactly once?

Hamiltonian cycle problem

Hamiltonian path problem

Subset sum problem

Turnpike reconstruction problem

Ans – B

Halting problem by Alan Turing cannot be solved by any algorithm, So it is an example for_____

Undecidable problem

Decidable problem

Complete problem

Trackable problem

Ans – A

A non-deterministic algorithm consist of how many stages of procedure?

3

4

5

6

Ans – 3

Which of the following statements are TRUE?(1) The problem of determining whether there exists a cycle in an undirected graph is in P.(2) The problem of determining whether there exists a cycle in an undirected graph is in NP.(3) If a problem A is NP-Complete, there exists a non-deterministic polynomial time algorithm to solve A.

1,2

1,3

1,2,3

2,3

Ans – C

The CNF satisfiability problem belongs to ______class. It deals with Boolean expressions.

NP class

P class

NP complete

NP hard

Ans – C

The Problems that we can solve in polynomial time are ___

Decision

Complete

Intractable

Tractable

Ans – D

If an NP- complete problem is polynomially reducible, how many conditions it has to be?

1

2

3

4

Ans – B

What is the time complexity in which the Euler’s circuit problem can be solved ?

O(N log N)

O(N2)

O(N)

O(log N)

Ans – B

Which are the problems that cannot be solved by any algorithm?

Undecidable problems

Decidable problems

Tractable problems

Intractable problems

Ans – A

The class of decision problems that will be solved by non-deterministic polynomial algorithms is:

Hard

Complete

NP

P

Ans – C

Which is the choice of polynomial class that led to the development of an extensive theory?

Decision complexity

Problem complexity

Time complexity

Computational complexity

Ans – D