AOA PT-I C1

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Hi Budhwani, when you submit this form, the owner will be able to see your name and email address.

* Required

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Roll No. *

| 1902021 | ∨ |

2

Name of the Student *

| Budhwani Tushar Parmanand | ∨ |

3

Which of the following is appropriate for selection sort?

i.   It is an in-place sort
ii.   It is suitable for small arrays
iii.   It has worst case complexity O(n^2).
iv.   It performs better than insertion sort. *
(1 Point)

◯ Only ii, iii, iv

○ All i,ii,iii and iv

○ Only ii, iii

◉ Only i,ii,iii

4

Compare the following functions asymptotically:
F(n)=2^log n
G(n)=n^√n *
(1 Point)

○ F(n) = G(n)

○ F(n)

○ F(n)!=G(n)

◉ F(n)> G(n)

5

Express the complexity of the following algorithm using recurrence relation:
 Algo (int n)
{
if (n>0)
{for(i=0i *
(1 Point)

○ T(n)=T(n/2) * log n

○ T(n) =T(n-1) * log n

○ T(n)= T(n/2) + log n

◉ T(n)=T(n-1) + log n

6

What is the time complexity for the following piece of code?
for (i =0 ;i *
(1 Point)

○ O(n)

○ O(nlog2 n)

○ O(⌈log3 n⌉)

◉ O(log3 n)

7

What is the time complexity for the following piece of code?
for (i =0 ;i *i *
(1 Point)

◉ O(√n)

○ O(n^2)

○ O(log2 n)

○ O(log3 n)

8

Which of the following is not appropriate option for the following code:
F(n)= 2n+3 *
(1 Point)

○ F(n)= O(n)

○ F(n)= O(n*log n)

◉ F(n)= O(log n)

○ F(n)= O(n2)

9

Consider the following array. What is the output of the quicksort after second iteration?
[14,17,13,15,19,10,3,16,9,12] *
(2 Points)

○ [10,12,13,9,3,14, 19,16,15,17]

○ [10,3,9,13,12,14,19,16,15,17]

◉ [3 9 10 13 12 14 19 16 15 17]

○ [9 ,3,10,13,12,14,19,16,15,17]

10

Which of the following is correct definition of NP Hard problems? *
(1 Point)

◉ A problem is NP-hard if all problems in NP are polynomial time reducible to it, and the problem itself is NP

○ A problem is NP hard if it is NP and it is difficult.

○ A problem is NP-hard if all problems in NP are polynomial time reducible to it, even though it may not be in NP itself

○ A problem is NP hard if it is NP and hard.

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Choose the most appropriate option for the following complexity function:
F(n)= 2n+3 *
(1 Point)

○ F(n) = O(n2)

◉ F(n)= Θ (n)

○ F(n)= O(n)

○ F(n)= Ω(n)

12

What is the time complexity for the following piece of code?
for (i =0 ;i *
(1 Point)

◉ O(n^2)

○ O(nlog3 n)

○ O(nlog2 n)

○ O(√n)

13

Which of the following algorithm does not use divide and conquer design strategy? *
(1 Point)

○ Max Min algorithm

● Insertion sort

○ Quick sort

○ Merge Sort

14

Given the recurrence relation, find its complexity using O notation.
T(n)=2* T(n/2)+ n *
(1 Point)

○ T(n)= O(2^n)

○ T(n)= O(n2^n)

○ T(n)= O(n/2)

● T(n)= O(n log n)

15

Given the recurrence relation, find its complexity using O notation.
T(n)=2* T(n-1)+ n *
(1 Point)

● T(n)= O(2^n)

○ T(n)= O(n^2)

○ T(n)= O(n2^n)

○ T(n)= O(2n)

A thief enters a house for robbing it. He can carry a maximal weight of 50kg in his bag. The weight and the values of items are given below. What items he should take, if he is allowed to take a fraction of any item with him?

Items	weight	value
I1	10	45
I2	15	50
I3	15	60
I4	30	180
I5	35	100 *

(2 Points)

- 🔘 <1,0,0.67,1,0>
- ⚪ <0,1,0,0,1>
- ⚪ <0,0,1,0,1>
- ⚪ <0,0,0,1,0.57 >

17

Which of the following is example of quadratic complexity? *
(1 Point)

- ⚪ F(n)= 2n+3
- ⚪ F(n)= 2n^3+3n^2+3n+1
- ⚪ F(n)= n+2
- 🔘 F(n)= 2n^2+3n+1

18

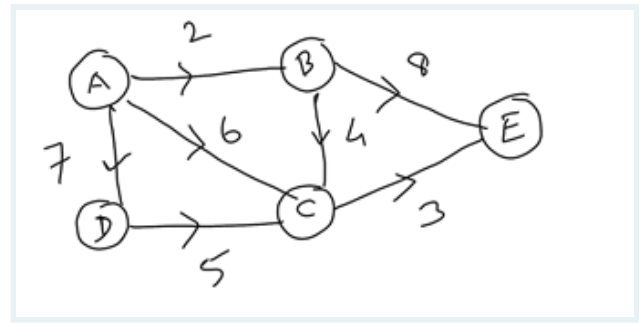Which of the following is asymptotically correct? *
(1 Point)

- ⚪ n^m = Θ(n^k+m)
- ⚪ Sqrt(log n)= O(log log n)
- 🔘 n^log n= O(2^n)

○ 2^2n = O(2^n)

19

Consider the following graph with vertex A as the source vertex. What is the output of the Dijkstra's algorithm after iteration-3? *
(2 Points)

○ d-array:[0,2,6,7,inf]; pi-array: [-, A,A,A,-]

○ d-array:[0,2,6,7,10]; pi-array: [-, A,A,A,B]

● d-array:[0,2,6,7,9]; pi-array: [-, A,A,A,C]

○ d-array:[0,2,6,7,9]; pi-array: [-, A,B,A,C]

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