

QUIZ 1

- 1) **Two main measures for the efficiency of an algorithm are**
 - A. Processor and memory
 - B. Complexity and capacity
 - C. Time and space**
 - D. Data and space
- 2) **The time factor when determining the efficiency of algorithm is measured by**
 - A. Counting microseconds
 - B. Counting the number of key operations**
 - C. Counting the number of statements
 - D. Counting the kilobytes of algorithm
- 3) **Which of the following case does not exist in complexity theory**
 - A. Best case
 - B. Worst case
 - C. Average case
 - D. Null case**
- 4) **Which of these is the correct big-O expression for $1+2+3+\dots+n$?**
 - A. $O(\log n)$
 - B. $O(n)$
 - C. $O(n \log n)$
 - D. $O(n^2)$**
- 5) **Which of the following formulas in big-O notation best represent the expression $n^2+35n+6$?**
 - A. $O(n^3)$
 - B. $O(n^2)$**
 - C. $O(n)$
 - D. $O(42)$
- 6) **What term is used to describe an $O(n)$ algorithm.**
 - A. Constant
 - B. Linear**
 - C. Logarithmic
 - D. Quadratic
- 7) **Answer true or false for this statement: For all possible inputs, a linear algorithm to solve a problem must perform faster than a quadratic algorithm to solve the same problem.**
 - A. TRUE
 - B. FALSE.**

- 8) Here is some code for an integer variable n :

```
while (n > 0)
{
    n = n/10; // Use integer division
}
```

What is the worst-case time analysis for the above loop?

- A. $O(1)$
 - B. $O(\log n)$
 - C. $O(n)$
 - D. $O(n^2)$
- 9) Express the formula $(n - 2) * (n - 4)$ using big-O notation:

- A. $O(1)$
- B. $O(8)$
- C. $O(\log n)$
- D. $O(n)$
- E. None of the above

- 10) Big-O of the following algorithm

```
i=1;
while(i<=n)
    i=i*3;
```

- A. $O(n)$
- B. $O(i)$
- C. $O(\log_3 n)$
- D. $O(\log_2 n)$

- 11) Big-O of the following algorithm

```
i=s=0;
while(s<n)
{
    i++;
    s+=i;
}
```

- A. $O(n)$
- B. $O(\log_2 n)$
- C. $O(i)$
- D. $O(\sqrt{n})$

- 12) For the following C++ code fragment, find $T(n)$, the exact number of exchange operation (operations to count are shown in bold font) in terms of n in worst-case

```
FOR i:= n-1 DOWNT0 1 DO
    FOR j:=1 TO i DO
        IF  $A[j] > A[j+1]$ 
            THEN exchange value of  $A[j]$  and  $A[j+1]$ ;
```

$T(n) = n-1.$