


<https://swayam.gov.in>

https://swayam.gov.in/nc_details/NPTEL

srikar.molahalli@gmail.com ▾

 NPTEL (<https://swayam.gov.in/explorer?ncCode=NPTEL>) » Design and analysis of algorithms (course)

 Click to register
for Certification
exam

https://examform.nptel.ac.in/2025_01/exam_form/dashboard

 If already
registered, click
to check your
payment status

 Course
outline

 About
NPTEL ()

 How does an
NPTEL
online
course
work? ()

 Week 1 :
Introduction
()

 Week 1 :
Analysis of
algorithms ()

 Week 1 Quiz
()

Week 1 Quiz

Your last recorded submission was on 2025-02-04, 22:40 Due date: 2025-02-05, 23:59 IST. IST

All questions carry equal weightage. You may submit as many times as you like within the deadline. Your final submission will be graded.

 1) An algorithm has two phases. The first phase, initialization, takes time $O(n^3)$. The **2 points** second phase, which is the main computation, takes time $O(n^2)$. What is the most accurate description of the complexity of the overall algorithm?

- ☐ $O(n^6)$
☐ $O(n^5)$
☒ $O(n^3)$
☐ $O(n^2)$

 2) We are using a computer that performs 10^8 basic operations per second. We are **2 points** trying to determine the worst case time complexity of a library function that is provided to us, whose code we cannot read. We test the function by feeding large numbers of random inputs of different sizes. We find that for inputs of size 50 the function always returns well within one second, for inputs of size 500 it sometimes takes a couple of seconds and for inputs of size 5,000 it sometimes takes over 15 minutes. What is a reasonable conclusion we can draw about the worst case time complexity of the library function?

- ☐ $O(n^4)$
☒ $O(n^3)$
☐ $O(n^2 \log n)$
☐ $O(n^2)$

 3) Suppose $f(n)$ is $2n^2+4n+5$ and $g(n)$ is $7n^3 + 5n^2 + 12$. Let $h(n)$ be a third, unknown **2 points** function. Which of the following is **not** possible.

- ☐ $h(n)$ is $O(f(n))$ and $h(n)$ is also $O(g(n))$

● Quiz: Week 1 Quiz (assessment? name=215)

Week 2 : Searching and sorting ()

Week 2 Quiz ()

Week 2 Programming Assignment ()

Week 3 : Graphs ()

Week 3 Quiz ()

Week 3 Programming Assignment ()

Text Transcripts ()

Books ()

Download Videos ()

Lecture Material ()

Problem Solving Session - Jan 2025 ()

- ☐ $h(n)$ is not $O(f(n))$ and $h(n)$ is also not $O(g(n))$
- ☐ $h(n)$ is $O(f(n))$ but $h(n)$ is not $O(g(n))$
- ☒ $h(n)$ is $O(g(n))$ but $h(n)$ is not $O(f(n))$

4) How many times is the comparison $i \leq n$ performed in the following program? **2 points**

```
int i = 60, n = 300;
main(){
    while (i <= n){
        i = i+2;
        n = n-3;
    }
}
```

- ☐ 48
- ☐ 49
- ☒ 50
- ☐ 51

5) If $T(n)$ is $O(n^{4/3})$ which of the following is **false**?

2 points

- ☒ $T(n)$ is $O(n \log n)$
- ☐ $T(n)$ is $O(n^2)$
- ☐ $T(n)$ is $O(n^2 \log n)$
- ☐ $T(n)$ is $O(n^3)$

You may submit any number of times before the due date. The final submission will be considered for grading.

Submit Answers