Quiz 4

Q1

Solve $T(n) = 4T(\frac{n}{2}) + n$ using he master theorem:

1. $a = ?$

   Answer: 4

2. $b = ?$

   Answer: 2

3. $f(n) = ?$

   Answer: n

4. To make $f(n) = O(n^{(log_b a)-\epsilon})$, the largest possible value for ϵ is ?

   Answer: 1

Q2

Solve $T(n) = 3T(\frac{n}{2}) + n$ using the master theorem. Which of the following is ture?

1. $f(n) = O(n^{(log_b a)-\epsilon})$
2. $f(n) = \Theta(n^{log_b a})$
3. $f(n) = \Omega(n^{(log_b a)+\epsilon})$
4. None of the above is true

Answer: Option 1

Q3

Solve $T(n) = 9T(\frac{n}{3}) + n^2$ using the master theorem. Which of the following is ture?

1. $f(n) = O(n^{(log_b a)-\epsilon})$
2. $f(n) = \Theta(n^{log_b a})$
3. $f(n) = \Omega(n^{(log_b a)+\epsilon})$
4. None of the above is true

Answer: Option 2

Q4

Solve $T(n) = 9T(\frac{n}{3}) + n^3 log n$ using the master theorem. Which of the following is ture?

1. $f(n) = O(n^{(log_b a)-\epsilon})$
2. $f(n) = \Theta(n^{log_b a})$

3. $f(n) = \Omega(n^{(log_b a)+\epsilon})$
4. None of the above is true

Answer: Option 3

Q5

Solve $T(n) = 9T(\frac{n}{3}) + n^2 logn$ using the master theorem. Which of the following is ture?

1. $f(n) = O(n^{(log_b a)-\epsilon})$
2. $f(n) = \Theta(n^{log_b a})$
3. $f(n) = \Omega(n^{(log_b a)+\epsilon})$
4. None of the above is true

Answer: Option 4

Q6

When using the master theorem to solve a recurrence, after we find a constant $\epsilon > 0$ such that $f(n) = \Omega(n^{(log_b a)+\epsilon})$, what is the name of the condition we also need to check?

Answer: regularity