Problem 1-1

$T(n) = 3T(n/2) + n^2 = a7\left(\frac{n}{b}\right) + f(n)$

$f(n) = \Omega\left(n^{\log_2 2^{3+\varepsilon}}\right)$

$T(n) = \theta(n^2)$

Problem 1-2

$a = 7$

$b = 2$

$\theta(n^{\log 7})$

Problem 1-3

$4T\left(\frac{n}{2}\right) + n^2$

$\theta(n^{\log_2 4} + n^2)$

Problem 1-4

$3T\left(\frac{n}{4}\right) + n \log n$

$\theta(n \log n)$

Problem 1-5

$4T\left(\frac{n}{2}\right) + \log n$

$\theta(\log n^2)$

1.6

$T(n-1) + n$

NA (Does not apply)

1.7

$4T(\frac{n}{2}) + n^2 \log n$

$\Theta(n^2 \log n)$

1.8

$\Theta(n^{\log_2 5})$

1.9

Does not apply

1.10

~~log~~ $\Theta(n^{1/2})$

1.11

$\Theta(\log^2 n)$

1-12

Does not apply

1-13

$\Theta(n^{1/2})$

1-14

$\Theta(n \log^2 n)$

1-15

Does not apply

1-16

$\Theta(n^{1/2} \log n)$

1-17

$\Theta(n^{0.51})$

1-18

$\Theta(n!)$

1-19

$\Theta(n^{\log 3})$

30

$O(n^2)$

21

$O(n \log n)$

22

$O(n^2)$

23

$O(n^3)$

24

$O(2^n)$

25

$O(\log n)$