PART 1

1. T(n) = 3T(n/2) + n

Solution: **Ɵ(n ^ loga b)**

a = 3

b = 2

f(n) = Ɵ(n) => d =1

b^d = 2 => a > bd So, Case 3

Thus,

T(n) = Ɵ(n ^ loga b)

1. T(n) = 64T(n/8) – n^2(log n)

Solution: **NA**

f(n) = n^2(log n)

Here f(n) is not in the form of Ɵ(n^d). So we cannot apply Master Theorem.

1. T(n) = 2nT(n/2) + n^n

Solution: **NA**

f(n) = n^n is not in the form of Ɵ(n^d). So we cannot apply Master Theorem.

1. T(n) = 3T(n/3) + n/2

Solution: **Ɵ(n3 log n)**

a = 3

b = 3

f(n) = Ɵ(n) => d = 1

b ^ d = 3 = a => a= bd So, Case 2

Thus,

T(n) = Ɵ(nd log n) = Ɵ(n3 log n)

1. T(n) = 7T(n/3) + n^2

Solution: **Ɵ(n2)**

a = 7

b = 3

f(n) = Ɵ(n ^ 2) => d = 2

b^d = 32 = 9 > a => a < bd  So, Case 1

Thus,

T(n) = Ɵ(nd) = Ɵ(n2)