**Master Theorem Solution (PART – 1):**

a) T(n) = 3T(n/2) +n

a = 3, b = 2, d = 1

Since 3> 2^1, case 3 applies, T(n) = Θ(n^log a{base 2}) = Θ(n^log 3 {base 2})

**Answer**: Θ(n^log 3 {base 2})

b) T(n) = 64T(n/8) - n^2(log n)

a= 64, b=8, f(n)= - n^2(log n)

Master Theorem does not apply for case when : (f(n) is not positive).

**Answer**: NA

c) T(n) = 2nT(n/2) +n^n

a = 2n, b = 2, d = n

Master Theorem does not apply for case when : (a is not constant).

**Answer**: NA

d) T(n) = 3T(n/3) + n/2

a = 3, b = 3, d = 1

Since 3 = 3^1, case 2 applies, T(n) = Θ(n^d log n) = Θ(n log n)

**Answer:** = Θ(n log n)

e) T(n) = 7T(n/3)+n^2

a = 7, b = 3, d = 2

Since 7 = 9, case 1 applies, T(n) = Θ(n^d) = Θ(n^2)

**Answer:** Θ(n^2)