Problem 1:

b) Using telescoping we can find the bound for ,

.

.

.

.

It will go on till

Hence,

c)

Problem 2:

As per Master’s Theorem,

a = 4 , b = 2,

, hence

vs

As, , so case 2 of theorem holds .

Hence, .

b)

As per Master’s Theorem,

a = 2 , b = 2,

, hence

vs

As, , so case 1 of theorem holds .

Hence, .

c)

As per Master’s Theorem,

a = 7 , b = 3,

, hence

vs

As, , so case 3 of theorem holds .

Hence, .

d)

As per Master’s Theorem,

a = 2 , b = 8,

, hence

vs

As, , so case 2 of theorem holds .

Hence, .