P21CO006

Question 4

total radio channels K = 1001
Cluster cell size N = 9

So, channels in each cluster J = $\frac{K}{N} = \frac{1001}{9}$

$= 111.22$

≈ 111

now, area of each cell is $A_{cell} = 6\ km^2$

So, area of cluster will be $A_{cluster} = 9 \times 6$

$= 54\ km^2$

So, total no of cluster in area $2100\ km^2$

$M = \frac{2100}{54} = 38.88$

≈ 39 clusters

ans of a

So, total capacity of using frequency reuse

$= MJN$

$= 39 \times 111 \times 9$

~~$= 233766$~~

$= 38961$ channels

P21C0006

no, total no of channels $k = 1001$

cluster size $N = 4$

So, channels in each cluster $J = \frac{k}{N} = \frac{1001}{4}$

$= 250.25$

≈ 250 channels

now, area of each cell is Area $= 6\,km^2$

so, area of cluster $A_{cluster} = 6 \times 4\,km^2$

$= 24\,km^2$

ans of b

total no of cluster in Area $2100\,km^2$

$M = \frac{2100}{A_{cluster}} = \frac{2100}{24} = 87.5$

≈ 87

ans of c

now, total capacity $C = MJN$

$= 87 \times 250 \times 4$

$= 87000$ channels

now,

capacity

for $N = 9 \rightarrow 38961$

& for $N = 4 \rightarrow 87000$ channels

so we can say that decreasing cluster size increase capacity.