```
Assignment-I
                                                                                                        \frac{1}{I} = \frac{(D|R)^2}{I} = \frac{2}{I}
              en data:
                                                                                                                                  ab 32:21 = ==
                        = 15dB (minimum required)
          Path loss exponent @ n=n@ transques south Path loss exponent
                                                                                                                     N=12 can be used.
           no.06.00-channels is = 6
                                                                                                                                                   System
           Frequency reuse tactor \alpha = \frac{D}{R} = \sqrt{3N}
                                                                                                                                         No. et. vielle
@ considering 7 cell reuse pattern, n=4, N=7
                                                                                                                    channels / cut = 19
                                                                        Blocking probability = 51. = 0.05
         Q = \sqrt{3} \times 7 = \sqrt{21} = 4.5826 \approx 4.58
                                                                                        Reguest sale 1 = 2 hous
    \frac{S}{I} = \frac{(D/R)^n}{i_b} = \frac{(A.5826)^4}{6270001} = \frac{440.01}{00186} = 73.33
\frac{S}{i_b} = \frac{(A.5826)^4}{6270001} = \frac{440.01}{00186} = 73.33
       = 18.65 dB
                                                                                                                                                       System A
       As the SII is greater than the minimum requirement,
        traffic intensity per uses = Au = AH = besused nos F=M
 6 n=3, N= = (7 cell reuse pattern)
               For 6.08 = 0.05, C=19. From 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 10.00 = 1
               I I Di number of us as some of ported in it.
           As the SII is less than the minimum requirement, have to
                                                                        U = A/AL = 14/021 = 140 USCNS.
          Use N77.
         -. For total 394 cells, total in ef. subscribers that a
         By checking i=2, j=2 next possible value of N=12+j2+ij=12;
                                       he purposted by saystem A is 140 x 394 = 35, 160
                    N=12 (12 cell reuse pattern)
           FOY N=12
                       Q = \frac{D}{R} < \sqrt{3N} = \sqrt{36} = 6
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edu :

N=7

Assignment - I $\frac{S}{I} = \frac{(D|R)^{0}}{i} = \frac{(b)^{3}}{2} = 36$

given data:

:=18.65 98

을 = 15.56 dB

= 15dB (minimuly required)

AS SII is greater than the minimum requirement Puth loss expanent @ n=4, 6 n=3

N=12 can be used.

10.06.co-channels to = 6

2) system

Frequency reuse tackor a= D= Jan

No. of . wells

usidesing I cell reuse pattern, n=4, N=7 Channels Cell

Blocking probability = 5% = 0.05

 $\lambda = 2$ hour

holding time H = 3 mins = (3/60) hours = 13-33

System A

no. et. charnels (a) (b) = 19 charnels (c) 110 on

traffic intensity per user = Au = AH = 12x (3/60)200 :

: 35 N = # 20 Paylen Paylen)

For Gos = 0.05, c=19. From Erlang & chart table 10.01 = total traffic A = 14.32 2 14 Erlangs

.. The number of users can be supported per cell is the SII is less than the minimum requirement, houg to U = A/Au = 14/0.1 = 140 Users.

For total 394 cells, total no. of. subscribers that checking i=2, i=2 next possible value of N=12+12+11=12; be supported by system A is 140 x 394 = 55, 160 N=12 (12 cell reuse pattern)

3 = 50 = 480 = 0 = 8

raffic intensity per user = Au = AH = 2x 3/60
Au = 0. Terlang.

For Gos o. Os, C=57. From Erbing B chart/table total trattic A = 51. 55 & 51 erlangs.

:. no. et. users that can be supported percell b= A/Au= st/o...

:. De 184...

:. As there are 98 cells, the total no of subscribers that

can be supposed by system B is, 510 x 98 = 49,980 MICE

Systema

a) no. of cells in the wow is assa.

Out = (a) us) almost go. on

cell radius R = + miles

traffic intensity per user = Au = AH = 2x (3/60) 100 = x 8PZ.S = 9 x 8PZ.Q = DDLD = (3/60) 100 Au = 0.1 Erlangs

total trattic, A = 95.24 = 95

.. the no. of creek that can be supported per all

can be supported by system c is, 950 × 49=46,550

ce esticand is pectners

Man I BM x frequence forder

in springs st are sb = 10000+ = 7

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& MUJ.
   Given data:
                            No.04. anovals (all (c) = 57
   Total city coverage = 1300 sq. miles
             traffic intensity per user = Au = 14= 2x3/1
           Celi radrus R = 4 miles
        allocated spectrum = 40MHZ = 40,000 KHZ 200 1:
        each channel bandwidth = 60 KMZ H sitters loso
Frequency reuse factor = 7 postanti assur. do. on ...
         Frlang B sys > GOS = 21/- = 0.02
   015 =
   sproly = 19 color to etat no of the ens sub st.
           n be supposed by system B is, 510 x 98 = 47,780
   soly
                                                    Stemic
    no. of cells in the iservice area.
(a)
                              الله في دارميسيد إيوال (د) = 100
        all radius R = 4 miles
                      tratific intensity part uses = Au = AII
        Cell coverage area = 2.598 x R² = 2.598 x 4°
                Huls or Islands
        total no obscells (Nc) = total city coverage tors los
                                One all coverage on solt :
         0081 = 3 Ne wasported per all
                            (1541-210 15181-37 191 tg)
. As there are 49 chills 18 = 31 cells of each of . subscribers strict
    no of channels per cell (c) system betroggue ed 11
(b)
           c= allocated spectrum
               channel BW x frequence factor
               40000
                        = 95.24 ~ 95 Channels/W/
                60×7
```

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A) alven data:
  traffic intensity of each cell
    For Gos = 0.02, C=95. From Erlangs B Chart ltable of
  traffic intensity, A. F. 831/3 2883 = SNAUE = WE DUNNOUS
      A=83 Erlangs/cell
                                   ZH309=
 Erabbic internated per uses = Baris Graphart mumissom
                                     tolang e is used.
       = no. of. cells x trattic intensity per cell
                                                    :0/05
       = 31 x 83 = 2573 Exlangs.
the totalino of users that can be usered tor 27000s
   trattic per user = 0.03 = 1 langs 08x5
   total no. of. users = Total traffic
                            no of charmels cell = 7000
     ber as = 100 Harris/col
   total no. of. user = 2573
          (b) a or. apaisty as of the iso wing
  TO be channels = 40 MHZ/rd 001 do - rop = 2 it toor Los or
H
                            = 666
   the no. of mobiles per channel = no. of users 10 85766

no of channels 666
        ng. et mobiles per channel = 128 on muri 128.78
the theoritical maximum number of users that could be
  served at one time by the system ou endulus as and
  CICO, H= TO Estangs trons estangly XOIE (Bable)
            =95 ×31 = 2945 USEUS. 80.0= 1. 8 = 200
```

which is 3.4.1. A the occupied customer base.

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rathic intensity of each cell
  aivendata:
   For GES = 0.02, C=95, From EnlangTHMAS= (WB LatoT
   Channel BW = 30 FHZ -> 2 28 implex channels experis sinteres
                                A=83 Erlangs [cull
             =60kHz
   traffic intensity per user = 0.1 Etlangspart mumisipa
   Erlang & is used.
              = 100.07. cells x tractic intensity per cell
  <u>soln:</u>
                          = 31x83 =2573 Enlangs.
(as) no. of channels in each cell for 4 cell reuse is ystemos ?
              f. users that can be sessied t
    10.00 channels = 24 MHZ
                   2×30/2HZ = 8400 channeli
                       total no. of users = total brattic
     no. 07- channels/cell = 400 channels
                    13 RU 4 Cells
                                  = 100 Channels/cell
                            60 tal no. of. useu = 2573
    901. capacity to's payect ischeduling
 (p)
    Total trattic = 907. 06 100 Exlangs = 90 Exlangs
                             247 09
           A=UAU
   maximum no. of users supported pericel =900
e) blue to the season to some must be then imaximum
   users available in user pool it lid smit sino to be
     c=100, A=90 Erlangs , from Erlang B chart (table,
    ans = 31. =0.03 . 2020 3412 = 15x 19=
```

tick is a mit. of this occupied in which bound

(d) It each all now uses 120° sectoring instead of omnidirectional tor each base istation. What is the new total no. of users that can be supported per all tor same blocking probability in (c)?

total 100 channels/cell.

Jnow by 120 sectioning -> 33.3 channels/au
Gos = 3-1.

From Erlang & chartltable.

traffic intensity A = 25 Erlangs | Sector no. ob. users | Sector = A | Au = 250 | Sector no. ob. users | Cell = 250 x 3 = 750 users 0 = 750 users.

(e) It each cell covers 5 sq. tm, then how many subscribers could be supported in an urban market that is so types for the case of omnidirectional base station antenna.

totalarea = 50 x so = 2500 sq. km Cellarea = 5 sq. km

no. of. cells = 2000 = 500 cells.

no. of users = 500 x 900 users lau

U = 4,50,000 users

(f) same scenario as les with 120 sectored antenna 500 cells; 750 users (cell

10. of. users U = 500 x750 = 3,75,000 Users.