DATE / / Master Theorem General Format T(n) = 0.T(n) + f(n)where a >1 b>1 and f(n) should tre always. Coses: 'n = 1000' = 010 1] f(n) >= <>> n 10960 03101 > (1) 2  $T(n) = \theta \left( n^{\log_b a} \right)$  $f(n) = n^{\log_b \alpha}$  $\lceil i \rceil$ T(n) = 0 (n/09,69 3/09 n)  $f(n) > n^{\log_b \alpha}$ 117 T(n) = 0. F(n) = = (n) T

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Q.
    T(n) = 4 T (1/2) + 100000 /
Soln:
            1477 a.
     Given :
           a = 4
    6100HD 14776 2 20
             f(n) = n
  -- n'0960 = n'09x4
                        = 82
             < n10960
      (n) 7
                            Case I
                  10 de 1 (1 )
                 ( n 109 Pa
     T(n)
           = 0
       T(n) = 0
                   (n2)
                         0 = (n)T
                     Date / 1 < (7 . 7
Q.
     (m) _
            = 2 T (())/2) += N(1) T
: 102
               a = 2
     Oriven:
                b = 2
              f(n) = n
      7 10969 = n 10927
               4 109 Pa
       f(n)
  ٠.
                               Case II
        = 0 (n 109 ba - log n
  T(n)
         = 0 (n. logn
   T(n)
```

```
Q. T(n) = 27 (1/2) + 12
: "102
     Given:
            a = 2/
              6=2
            t(u) = 25
 " n 10960 = n 10922 = n
            > 7/0960
  -- 7 ()
                               (ase III
               0 f(n)
     一(り)
            =
      T(n) = O(n^2)
 TIT
                 ( 1/2)
Q._
             4 T
     T(n)
2010:
     Given:
              a = 4(11) 3 = 1(m) 1-
             t(2) = 213
  = n logs a = n log 24 = n2
     f(n) > n 109 69
                              Case III
     T(n)
           = 0 + (n)
                    0 (n3)
        T(m)
               -
```

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T (91/10) +n-
a. Tin
5010:
        T'
                     Fra. + (m) 7
    T(n)
                  1-1
   111 oa)= 1
        b = 1.1
      f(u) = u
                  F(n)
      n 1098 a
               = n/09,1,10 = n(1)
             > n 109 b 9
      (m) 7
                               case III
                 (4)0) TA
       T(n)
             =0 f(n)
       T(n)
              = 0 (n)
                               MINE!
```

Ero = (n) }

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Q. T(n) = 8T (1/4) +n2
5017:
              a'= 8
     Griven:
               b= 4:
              f(n) = n2
                        = U_{3/3}
  :. n10969
             = 7/09 48
             > 10969
                        e = d (ase m
  \therefore f(n)
      T (n)
              0 f (m)
       T(n) = \theta (n^2)
Q. T(n) = 4T (n/2) + n3
           (n) = ( (n) logn)
2017:
     Given:
             b=2
            t(u) = u_3
  :. 10960 = n10924 = n2
             > 1,0960
   :. f(n)
                               Case III
     T(n) = 0 \cdot f(n)
             = \theta (U_3)
       T(n)
```

```
Q. T(n) = 3T (2n/6) + n
5017:
           \left(\frac{2n/2}{6/2}\right)^{6}
 III DEN) p = 3 Papola
        f(n) = n
   - Wlodpa = U100333
       f(n) = 0/10969
                              Case II
     T(n) = 0 (n. 10950 , 109n)
      丁(の)=
                O (n loga)
```

```
Q. T(n) = 8T \left(\frac{n}{4}\right)Tn
5611:
      Given:
                O.
               f(n) = n
   .. n 10969 = n 10948 = n 3/2
              < 9/10389
    5. f(n)
                                 (ase I
       T(n) = 0 (n/0969)
        T(n) = 0 (n^{3/2})
Q. T(n) = 16T (n/8) + n^2
 : 102
       Given:
                a = 16
                 b = 8
                f(n) = n2
                = n 109 216 = n + 13
    ". 1098 a
              > 710969
    ·. 4 (n)
                                  Case III
       T(n) = 0 f(n)
         T(n) = O(n^2)
```