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              DAA Assignment - 4
Qusi sol -
              T(n) = 3T(n|2) + n^2
              a=3, b=2 f(n) = n^2
           afb are constant of fcn) in the function
            .. Masteris theorem is applicable
                      C = loga
                       = log, 2 = 1.58
                       n° = n1.58 conten us Ln2
                  '. Case 3 us applicable
                       Tin) = O(n2)
92 saln! -
             T(n) = 4T (n/2) + n2
                a=4, b=2, f(n)=n^2
               C = log_1 a = log_1 4 = 2
                 n^{c}=n^{2} n^{c}=f(n)
                         Tin) = O(n2 logn)
                Couse 2
Q3 Soln! -
               T(n) = T (h/2) + 2h
               a=1, b=2, f(n)=2n
              C = logba = log1 = 0 nc = n0 = 1
               f(n) > nc
               - Case 3
               Tin) = O(2h)
              T(n) = 2hT(n/2)+n3
Gusy soln:
               a = 2^n b = 2 f(n) = n^n
          : a is neet constant, its value depends on w
            ". Master's theorem neet applicable.
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Pg-1

Gus seeln! -T(n) = 16T (n/4) + n a=16, b=4, f(n)=n C = logba = logy16 = 2 nc > fcn) Case 1 T(u) = Q(u2) Gus solu! -T(n) = 2T (n/2) + nlogw a=2, b=2, $f(n)=n\log n$ C = logba = log22 = 1 nc = h fen) >na Case 3 us applied Tin) = Q(nlogn) 97 Sol"!-T(n) = 2T(n/2) + nflogn a=2, b=2 f(n) = nflognC = log_2 = 1 nc=n non palynomiel diff, b/w nc f f(u) ". masters theorem notapplicable. T(n) = 2T (n/4) + n0.51 Ques soln! a=2, b=4, f(n) = n0.5) C = logpa = logy2 = 0.5 ne = 0 no.5 .. tin) >uc Couse 3 is applied T(n) = 0 (n0.51)

Gg soln! -T(n) = 0.5 T (n/2) + 1 a < 1 :. Master's theorem applicable Glosseln! -T(n) = 16T (n/4) + n! a=16, b=4, fcn1=n! (= logpa sea = log 16 = 2 nc= n2 f(n) >nc Cerse3 T(n) = O(u!) Oll Sellin T(n) = 4T (1/2) + logn a=4, b=2, fcn) = logn c = log_4 = 2 $n^{c} = n^{2}$ nc > f(n) - Case I us applied

T(n) = 0 (n2)

\$12 soln! - T(n) = In T(1/2) + logn

a ils met constant, thereferre master's theorem not applicable.

T(n) = 3T(n/2) + nG13 Sceln! a = 3, b = 2 f(h) = nC = logba = log_3 = 1.58 n(= n1.58 > f(n) Couse · . Ten) = 0 (n1.58) T(n) = 3T (n/3) + 5h Q14 selusa=3, b=3, f(n)=JnC = logba = 1 n(=n)JW Case 1 is applied TCn) = O(n) T(n) = 4T (n/2) + cw GISsel"!a = 4, b = 2, f(n) = 0.2 $n^{c} = n^{2} \rangle f(n)$ - case I is applied T(u) = 0 (n2) T(4) = 3T(4/4) +n dogw 916 Seel 1 a=3, b=4, $f(n)=n\log w$ c = logba = loga3 = 0.78 nc = no.78 / fcm) : case 3 is applied Ton) = O (logu) 017 Soln: - T(n) = 3T (1/3)+1/2 a=3, b=3 fen)=n/2 C = logba = 1 nc=n >f(n) Casel! Ton = O(n) Q18 seelng - T(n) = 6+ (n/n) + n2 logn C = log, 6 = 1.63 n(= n163 2 fch) Cases is applied : Tout = O(n 2 logn) gigsen! -T(n) = 4T(n/2) + n logn C = log, U = 2 nc=12 ten) = 11 log 2 nc Ifcn) -: case 1 as applied TCn 1 = O(n2) T(n) = 647 (N/8) + n2 logn Q20 Soln! a=64,8=8 f(u) = n2log~ $C = log_h \alpha = 2$

nc=n2 L fcu)

Case 3 is applied T(n) = U(n2logn)

Q21 Seel! - $T(n) = 7\tau (n/3) + n^2$ a = 7, b = 3, $f(n) = n^2$ $C = log_b a = log_3 7 = 1.77$ $n^c = n^{1.77} / f(n)$ (as e = 3 is applied $T(n) = O(n^2)$ (g(n) = T(n) = T(n/2) + n(z - cosn)if f(n) is next vegular function

if the sterils thereoner can't applied.