TUTORIAL-04

Answer-01:-
$$T(n)=3T(n12)+n^2$$

 $a=3$ $b=2$ $f(n)=n^2$

.. a & b are constant and fini is a + ve function.

:. Master's theorem is applicable

$$c = \log_{5} a$$

$$= \log_{5} 3 = 1.58$$

which is $n^2 > n^{2.58}$

: case 3 us applied here

Answer-02'-
$$T(n) = 4T(n|2) + n^2$$

 $a = 4$, $b = 2$, $f(n) = n^2$

.. a & b are constant and fon is a positive function.

:. Master's theorem is applicable

- · case 2 us applied here

$$a=2$$
, $b=2$, $f(n)=2^n$

: a 1 b are consent and for is a tre function

.. Master's thousem is applicable.

C = 69 a = 609 2 D) 00-10-21 ". + (w) = uc i. case 3 is applied here T(n)= 0(2n) Answer-04:- T(n)= 20T(n/2)+n0 a=20 b=2 fenrant : a us not constant : vits value dépends on n. -. Master's theorem is not applicable here. Answer-05:- T(n)=16T(n/4)+n a= 16, b=4-f(n)=n i. a & b are constant and tenries a tre function C= 609 n a = logy 16 = logy 42 = 2 logy 4 = 2 of n° = n2 ·- fenorn : . couse 1 is applied here. T(n)= (n2) Answer-6:- TCn)= 2 T(n/2) + n/09 n 022 b=2 f(n)=nlogn .. a, b are constant and f(n) is a tre function C2 609 ha = W9,2-1 nc = n2 = n

··+(い)>n : case 3 vis applied T(n)=o(nlogn) Answer-07:- TCn)=2T(n12)+ n/logn a=2 b=2 f(n)=n/logn. i. a à bare constant à jons is a + ve function c- logba = 6092=1 nc = n'=n non-polynomial différence blu fcm à n'. :. Mouter's, theorem is not applicable. Answer-08:- T(n) = 2T(n/4) + n0.51 a=2, b=4, g(n)=n0.41 : a à b are constant à jen) is a tre function. :. Masser's theorem is applicable. c= logb a= log42 = 0-50 nc 2 no 50 :- t(v)> v = : case 3 is applicable. 1 T(n)= 0 (n°51) ver-09:- T(n)= 0.5 + T (n/2) + /n a=0.5 b=2 f(n)2 1/n · - a < 1 Masser's theorem is not applicable.

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Answer-10:- TCM= 167 (My)+ n!

a=16 b=4 fcm>n:

-: a & b are const. & fcm i

-: a & b are const. & for is a tre function. :. Masser's theorem is applicable.

c= logba.

= log416= 2

nc = n2

· · + cn>nc

:. case 3 is applied here

[TCn)= O(n!)]

Answer-112- TCn)= 47 (1/2) + Logn

az4 bz2 fcn7=logn

· : a & b are constant & finisis a tre function.

:. Masser's theorem is applicable.

 $c = \log_{b} \alpha = \log_{2} 4 = \log_{2}^{2} = 2\log_{2}^{2} = 2$

ncz n2

-- f(n) (n2

: case 1 is applied

T(n)=0(n2)

Answer-122 JAT (n/2) + logn

az Jn - b = 2 fon 2 by n

traterior ton isso:

:- Masser's theorem is not applicable.

Answer-13:- T(n)=8T(n(2)+na=3 b=2 fcm=n

== a l b are constant q sin is a tre function.

:- Mouser's theorem is applicable.

c= log ba= log_3 = 01.58

timen

-- case I is applied hore.

T(n)= 4(n1.58)

Answer-14:- τcnn : $3\tau (n13) + 5\pi$ a = 3 b = 3 $f cnn = 5\pi$

-. a a b are constant à fin is a tre function.

= masser's theorem es applicable.

c= Logpa = Log33 = 1

nc=n1=n

· fcnlkn°

: case 1 is applicable.

T(n)=o(n)

Answer-15'- TCD)= 9T(N/2)+c.n

a=4 b=2 f(n)=c-n

: · a & b are constant & for is a tre function.

: Master's theorem is applicable here.

c= 609 ba= 60924= 2

nc=n2

:. f(n) < n²

= case 1 is applicable here

Answer-16:- 7(n)= 37(N/4) +n logn az3 b=4 den=nlogn c= 609 ba= 609,3=0-79 nc = 00.79 == fcm> nc .. case c is applicable here. T(n)= O (nlogn) Answer-17:- T(n)= 3T(n/3)+n/2 a=3, b= 3, fcn+n/ !- Masser's theorem is applicable here. C= 609 pa z kog 3=1 nc= n1= n = f(n)=nc - case 2 is applied here Tin) = nlogn Answer-18:- TCn7= 6T (1/3) + n2 logn a=6 b=3 f(n)=rflogn · · Ma Ster's treorem is applicable hore. cz logba = log36 = 1.63 n = n 1.63 ": f(n))n' 3) case 3 is applied none T(n) = (2 (n2 (ogn))

Answer-19:- T(n)= $4T(n|n) + n/\log n$ a=4 b=2 f(n)= $n|\log n$: Masser's theorem is applicable here. $c=\log_2 a=(\log_2 4=\log_2 2^2=2\log_2^2=2\log_2 n)$: fenden

: case L is applied here.

Answer:-201- TCn)= 64T(n18) + n2logn

: a & b are consent but f(n) is a tre function.

Master's theorem is not applicable here.

Answer-231- $T(n)=7T(n)+n^2$ a=7 b=3 $f(n)=n^2$ -1 Master's theorem applied here $c=\log_b a=(\log_3 7=1.77)$ $n^2=n^{1.77}$ $n^2=n^{1.77}$

: cases is applied here.

2) T(n)= b(n2)

4 nuver-221- T(n)= T(n/2)+n(2-cosn)

-: fors is not regular function. ... Master's theorem december applied here.