

If force (F), length (L) and time (T) are taken as the fundamental quantities. Then what will be the dimension of density : **[Aug. 27, 2021 (II)]**

(a)  $[FL^{-4} T^2]$

(b)  $[FL^{-3} T^2]$

(c)  $[FL^{-5} T^2]$

(d)  $[FL^{-3} T^3]$

(a) Force,  $F = [MLT^{-2}]$

Length,  $L = [M^0 L^1 T^0]$

Time,  $T = [M^0 L^0 T]$

$\therefore$  Density =  $[F]^a [L]^b [T]^c$

$[ML^{-3}] = [MLT^{-2}]^a [L]^b [T]^c$

$[ML^{-3}] = [M^a L^a T^{-2a} L^b T^c]$

$[M^1 L^{-3}] = [M^a L^{a+b} T^{-2a+c}]$

On comparing

$a = 1$

$a + b = -3$

$1 + b = -3$

$b = -4$

$-2a + c = 0$

$c = 2a$

$c = 2$

$\therefore$  Density =  $[F^1 L^{-4} T^2]$