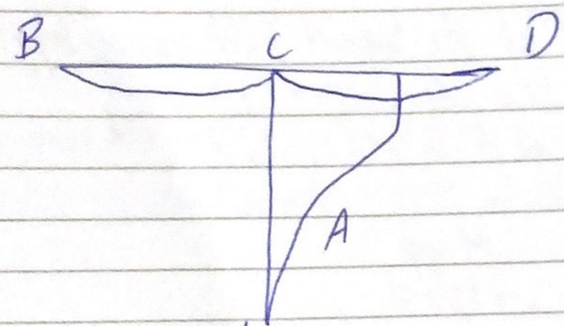
~~8~~

Assignment ①

a) the deflected shape of the given frame for $\alpha = 1$



b) for given $M = 20\,kNm$ and $\alpha = 1$

By Applying equilibrum Conditions

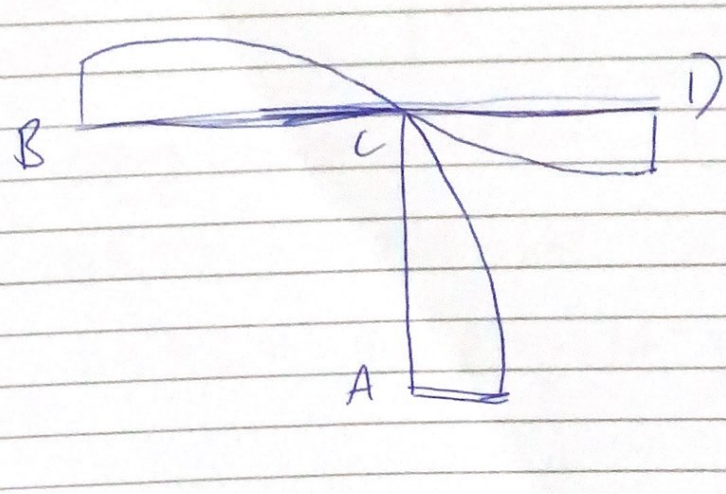
total horizontal forces $H = 0$, total vertical forces $V = 0$ and total bending moment acting in the given frame is $M = 0$

that is $MA + MD = 20\,kNm$ (applied moment)

since $\alpha = 1$ the given frame is symmetrical therefore

$MA = MD = 20/2 = 10\,kNm$

Therefore, bending moment diagram will be :-



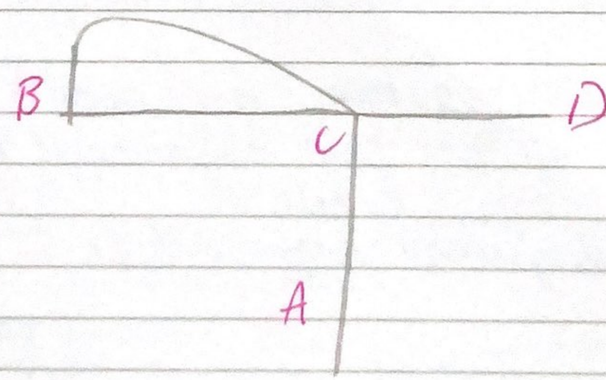
Bending moment Diagram (BMD)

c) for any value of moment in terms of α will be applying equilibrium equation,

taking moment at the support B at roller support moment at D is $MD = VD * (L + \alpha L)$
and moment at A is $MA = VA * L$

$MA + MD = Mapp$
since $VA = VD = V$,
$V(L + \alpha L) + VL = VL(2 + \alpha) = Mapp$
therefore $Mapp = VL(2 + \alpha) = \cancel{Mapp}$

Mapplied



Q2;

[missing Info the width of the beam]

Yield Mc/I or M/S

M = maximum moment in the beam
c = distance from neutral axis to the extreme fiber $(h/2)$

I = is the moment of inertia
S = elastic section modulus
~~M can be calculated~~

$PL/4 + wL^2/8 \Rightarrow M = PL/4 + \gamma(9.81)\,b\,h\,L^2/8$

$M = 0.25PL + 1.22625\gamma bhL^2$

Mc/I

$M = 0.25PL + 1.22625\gamma bhL^2$
$c = h/2$
$I = bh^3/12$

The resulating equation will be :-

$\sigma = (0.25PL + 1.2265\gamma bhL^2)(h/2)(bh^3/12)$

$\sigma = (0.25PL + 1.22625\gamma hbL^2)(6/bh^2)$