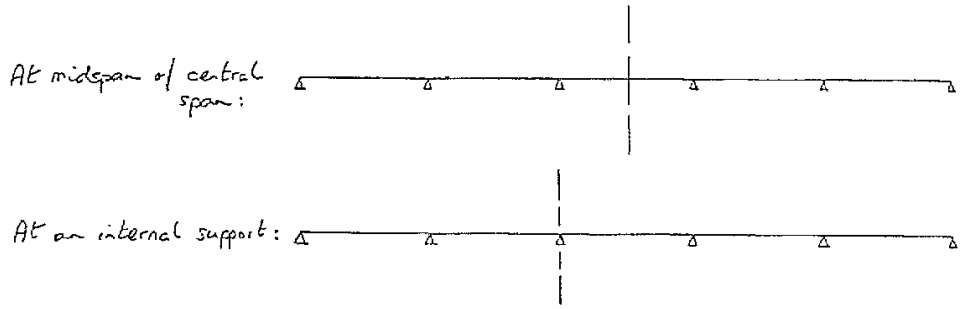
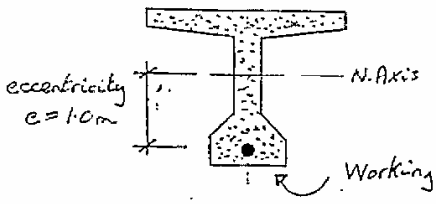
Question 11 Calculate the major axis plastic modulus of the same section:

Plastic modulus, Z_p =.....cm³

Question 12 Sketch the influence lines for bending moment for the following 5 - span continuous, constant interia, beam :



Question 13 For the following section, calculate the elastic bottom fibre stress under prestressing effects and a working load sagging moment of 12.5 MNm, assuming the section is fully effective and determinate:

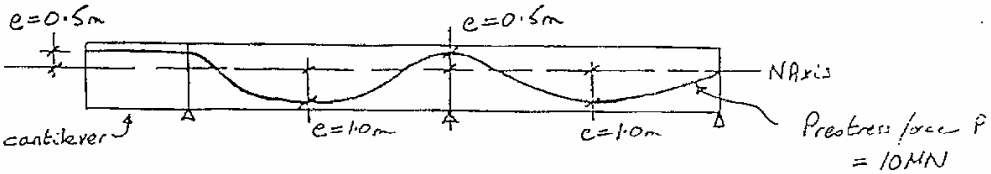


Area, $A = 2.5 m^2$

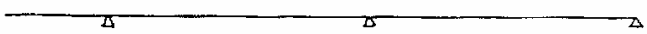
Bottom modulus, $Z_b = 1.25 m^3$

Total bottom fibre stress, f_b =.....MN/m²

If the section is indeterminate over two spans with the following cable profile:

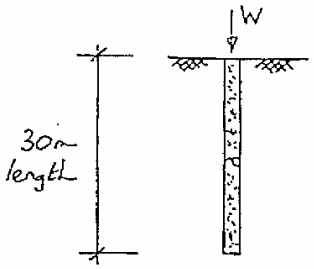


Sketch the primary prestressing moment diagram, indicating support and midspan values:



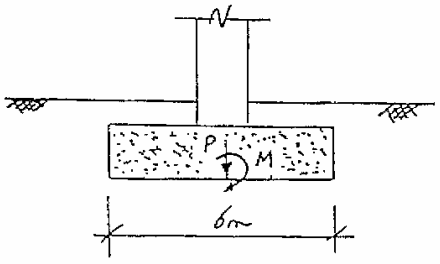
Sketch the secondary (parasitic) prestressing moment diagram, indicating an estimate of the magnitude:

Question 14 Estimate the working load (SLS) capacity of the following 900mm diameter concrete pile in stiff clay (undrained shear strength, c_u = 150kN/m² constant):



Working load, W =.....kN

Question 15 Calculate the bearing pressure distribution beneath the following unit length of rigid pad foundation:



P = 1200 kN
M = 1200 kNm

Stress on left hand side = ... kN/m²

Stress on right hand side = ... kN/m²

Is this an acceptable stress on dense sand?

Yes No (please circle)

End of examination