The rectangular barge shown below is made of steel plates and carrying some mineral ore dust of 2.5 T/m3 in the central compartment / cargo hold. Each of the 5 compartments is of 20 m in length. The transverse bulkheads and the end walls are of same thickness (8 mm). Assume the floors to be equidistant in the transverse cross section.

(i) Draw the still water shear force and bending moment diagrams.

(ii) Find the maximum shear force and maximum bending moment.

(iii) Estimate the maximum bending stress due to the longitudinal bending.

(iv) Will the deflected shape be sagging or hogging ?

Take the density of steel as 7.85 T/m3, of water as 1.025 T/m3.

Hint: bulkheads and end walls can be taken as concentrated loads on the hull girder.



