SHIP STRUCTURE - FINAL EXAM 11.01.2024

L = 90 + 5×**n** [*m*]; **B** = (**L** / 7.0); **T** = (**B** / 2.5); **D** = **H** = (**L** / 12.0); C_B = 0.68

,where "**n**" is the last digit of your student ID.

Frame spacing will be found from the following formula: a = (**L** / 500) + 0,48 [*m*]

1. Determine the dimensions of the spotted structural member as "**Q1**" in Figure 1, using GL Rules. (25 points)

2. Calculate the maximum axial compressive load (in kN) that may be safely carried by the spotted structural member as "**Q2**" in Figure 1, using GL Rules. (25 points)

Note that the structural member **"Q2"** has a rectangular cross section, which is a 120×10 flat bar section. Also note that the height of double bottom (h_{DB}) is 1,25 metres.

3. Determine the dimensions of the spotted structural member as "**Q3**" in Figure 2, using GL Rules. (25 points)

4. Calculate the section modulus (SM) of 140×70×10 angle section attached to a plate with a thickness of "*t*". The thickness needed for the calculation may be found by the following simple formula, where **L** is in [*m*] (25 points):

$t = \sqrt{L}$ [*mm*] (Remember that a standard thickness value should be used!)

Also remember that: $y_{NA} = \sum A_i y_i / \sum A_i$; $I_{NA} = \sum I_i + \sum A_i d_i^2$ and $SM = I_{NA}/y_{max}$

Normal strength steel (R_{eH}=235 [MPa]), whose modulus of elasticity (E) is 200 [GPa], is used. Service range is unlimited. Any other assumptions that may be needed for the calculations should be clearly stated. (90 minutes allowed)

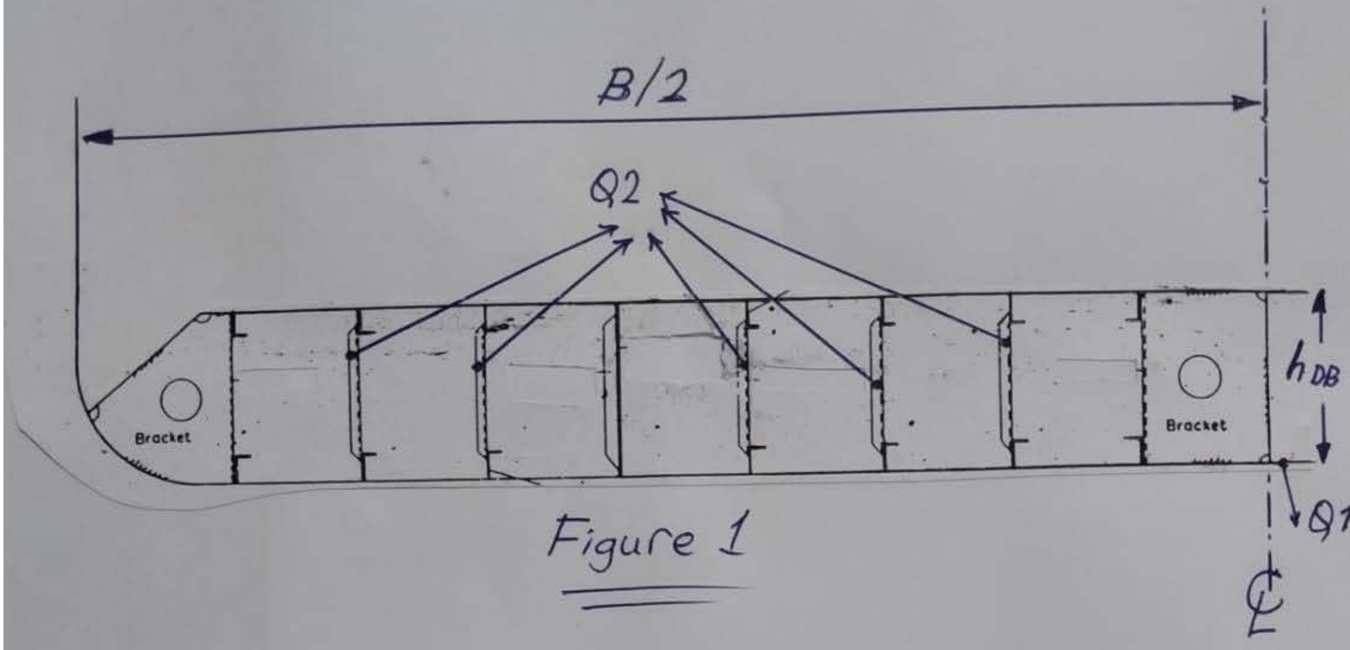

Figure 1

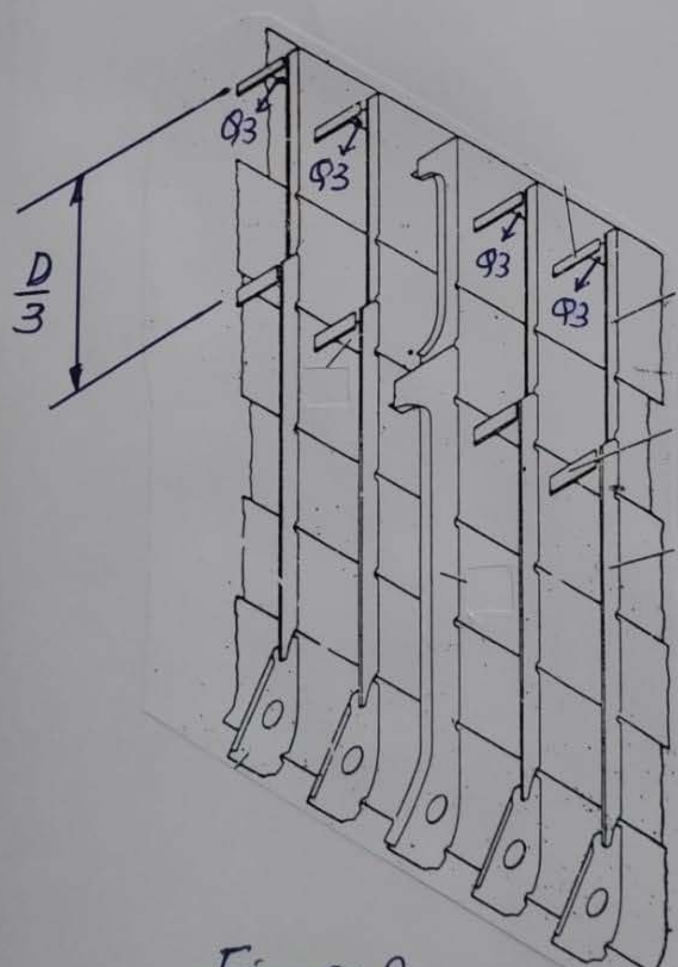

Figure 2