SHIP STRUCTURE – MAKE UP EXAM 22.01.2024

A view of mid-part of a “single bottom” tanker, whose main particulars are given below, is shown in Figure 1:

L = 100 + 5×**n** [*m*]; **B** = (***L*** / 7.0); **T** = (**B** / 2.5); **D** = **H** = (**L** / 12.0); C_B = 0.72

,where “**n**” is the last digit of your student ID. Frame spacing “a“ will be found from the following formula: a = (***L*** / 500) + 0,48 [*m*]

QUESTIONS

1. Determine the scantlings of the spotted structural member as “**Q1**”, using GL Rules. (25 points)

2. Determine the scantlings of the spotted structural member as “**Q2**” (25 points)

3. Determine the scantlings of the spotted structural members as “**Q3**” (25 points)

4. “Approximately” <u>calculate</u> the mid-ship section modulus (SM) of the “single bottom” tanker. Then compare it with the minimum mid-ship section modulus (W_{min}) required by GL. All the necessary thicknesses 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]) is used. Service range is unlimited. The distance between solid (plate) floors is 3×a.

Any other assumptions that may be needed for the calculations should be clearly stated. (90 minutes allowed)

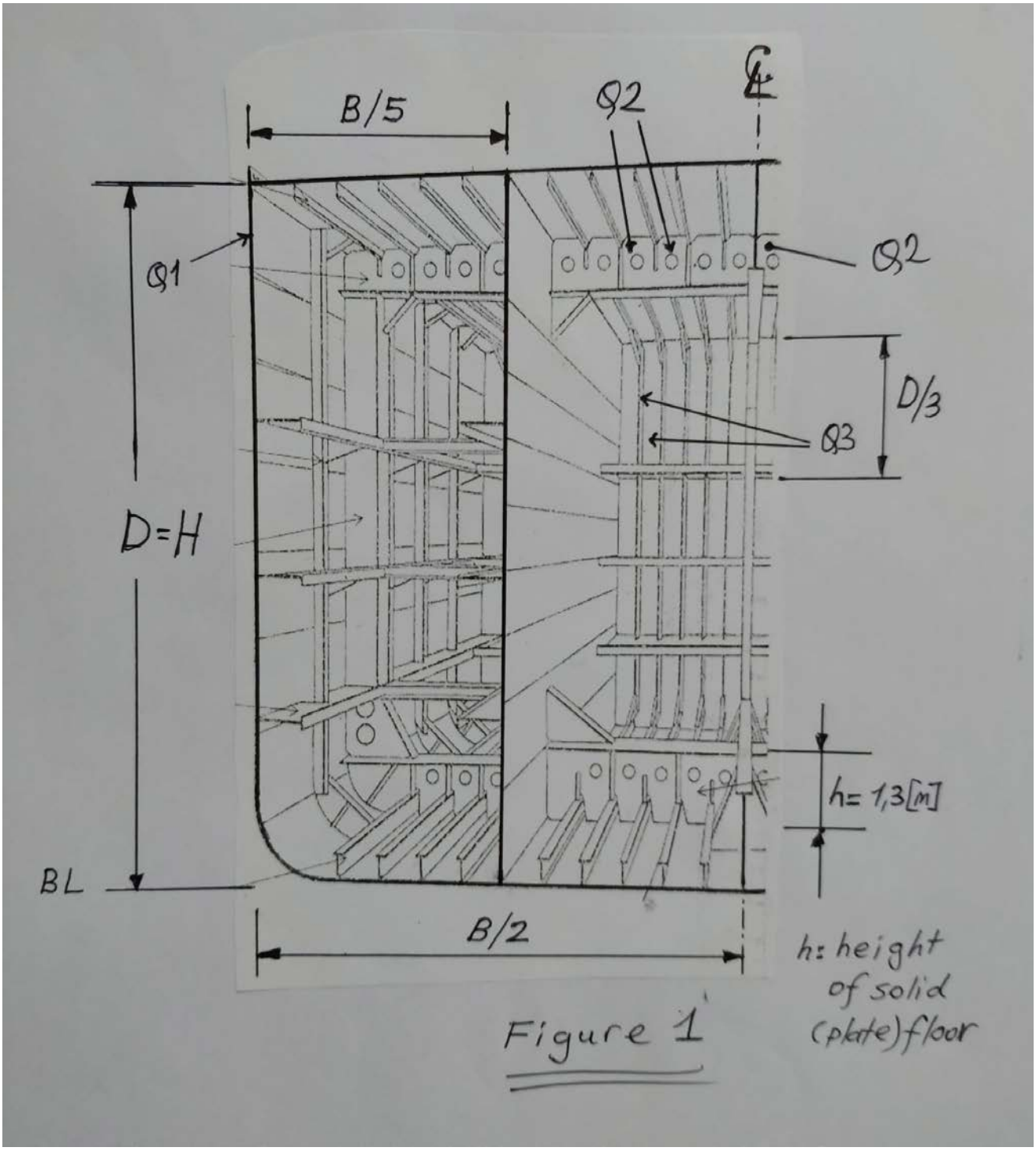

Figure 1