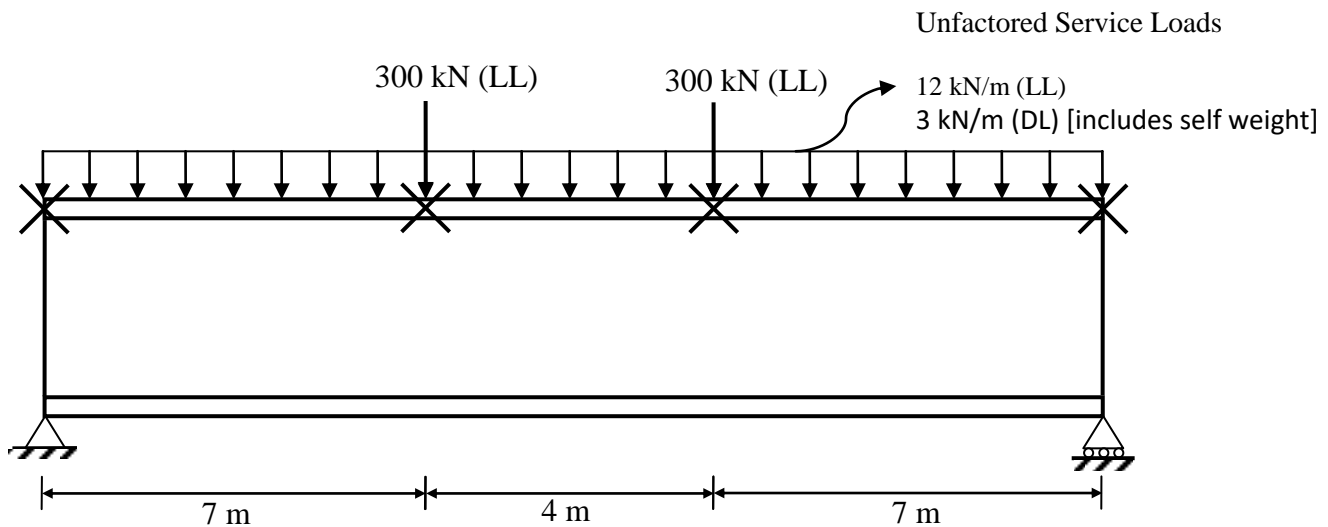## DESIGN OF STEEL STRUCTURES
2019 – 2020 Fall Semester

Homework 6 – Date Due: 23.12.2019

1) Design a plate girder (h/t_w>190). The girder has lateral supports at the ends and at concentrated load locations. Show your weld and stiffener design. (F_{EXX}=360 MPa)

Case a) Use S235 Steel and Stiffener Design without Tension Field Action (TFA)
Case b) Use S235 Steel and Stiffener Design with Tension Field Action (TFA)
Case c) Use S355 Steel and Stiffener Design without Tension Field Action (TFA)
Case d) Use S355 Steel and Stiffener Design with Tension Field Action (TFA)

Note : In cases (b) and (d) make sure that the girder proportions satisfy requirements for the application of tension field action according to Equation G2-7.

- Given loads are <u>service</u> loads. Use 1.2D+1.6L load combination.
- Service live load deflection Δ_{LL} should be less than L/360.
- Bearing plates of 200 mm width are provided under the concentrated loads and support locations.
- Design should satisfy all the concentrated loading limit states. Compression flange is not restrained against rotation.
- Indicate the total weight of the designed girder.
- Show your final calculations clearly.
- Show your final sketch (Cross-section details, stiffeners, etc.) for all cases on a single page.