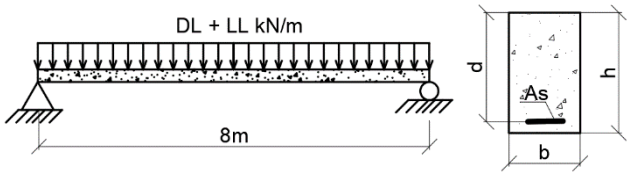
Kurdistan Regional Government- Iraq **Salahaddin University– Erbil** **College of Engineering** **Civil Engineering Department** **Bologna System**	**Mid-Term Exam- Spring Sem. (2023-2024)** **Date: 24/2/2024** **Time: 90 min** **Subject: Reinforced Concrete** **Lecturer:** Feirusha & Zana

Q.1: (35 MARKS)

Design a simply supported rectangular reinforced concrete beam for flexural requirements according to ACI code.



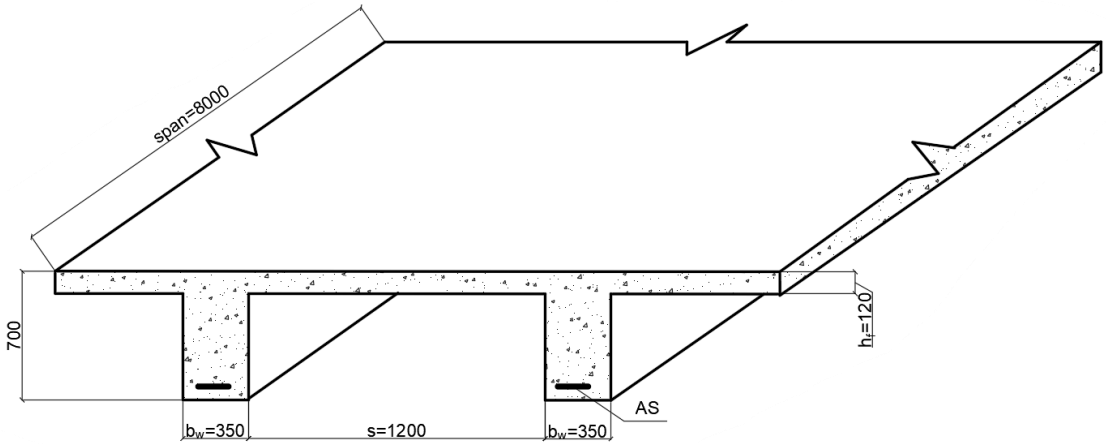
Assume:

- Concrete of fc' =24 MPa.
- Steel fy = 420 MPa.
- Use $\rho=0.5\rho_{max}$ and d/b =2
- Rebar diameter 25 mm for longitudinal reinforcement.
- Rebar diameter 10 mm for stirrups.
- W_D=10 kN/m (including self-weight) and W_L=15 kN/m

Q.2: (35 MARKS)

Determine the capacity moment ØMn of the T- beam shown.

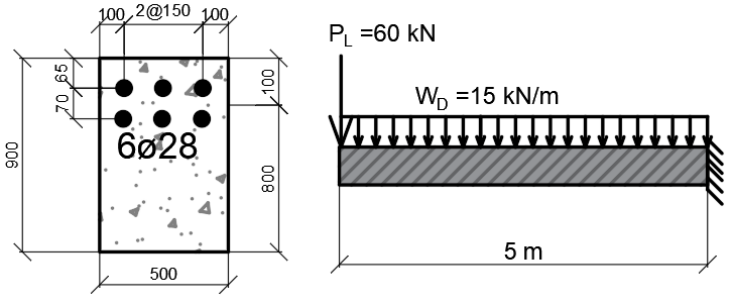
Assume: fc`=24MPa, fy=414MPa, A_S=6Ø20.



All dimensions are in mm

Q.3: (30 MARKS)

For the beam shown in Fig. calculate the instantaneous deflections due to the applied dead and live loads. Use normal-weight concrete with $f'c$=28 MPa and fy=420 MPa. Assume that the w_D values shown include the beam weight. Es =200 000 MPa.



With best wishes