Madent Al-Elem University College   **Reinforced concrete design I**   **Monthly Exam**
College Of Engineering   **Subject: Analysis& Design of Singly beam**   **Time: 1 hr and 15 min**
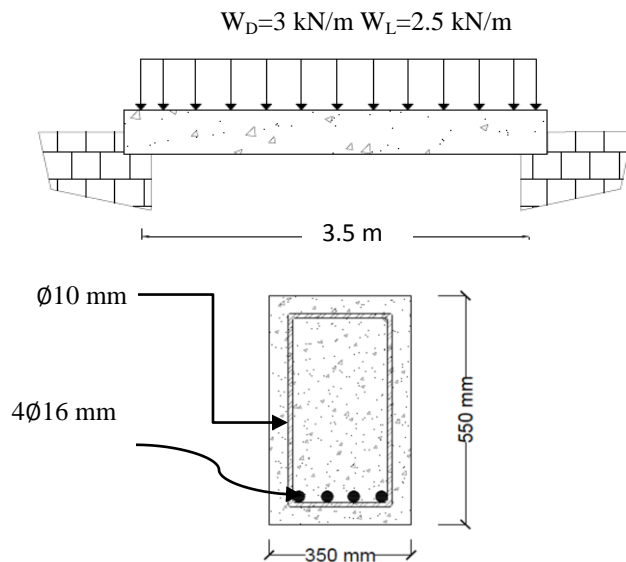**Civil Engineering Department**   **Stage: 3rd**

Answer all questions

Note: use fc`=25 MPa and fy=420 Mpa for all questions

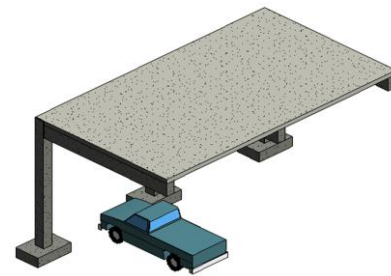Provide enough drawings to illustrate your answer for steel reinforcement.

Q1 (50%): check the adequacy of the beam shown below according to ACI requirement. Neglect the self-weight.

W_D=3 kN/m W_L=2.5 kN/m

3.5 m

Ø10 mm

4Ø16 mm

550 mm

350 mm

Q2 (50%): Design a cantilever rectangular reinforced concrete beam shown in Figure below.

Assume that the designer intends to use:

- M_u = 220 kN.m
- A width of 400 mm and a height of 500 mm.
- Rebar diameter 25mm for longitudinal reinforcement.
- Rebar diameter 10mm for stirrups.
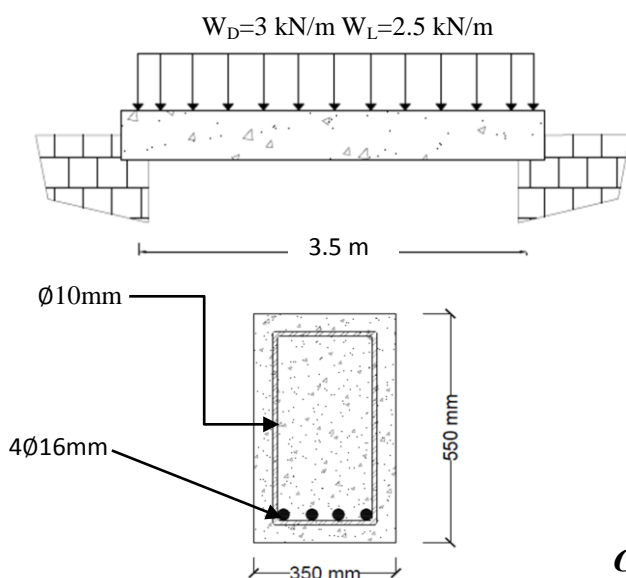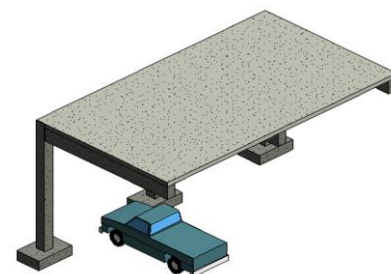- Two layers of reinforcement.

Good luck