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**
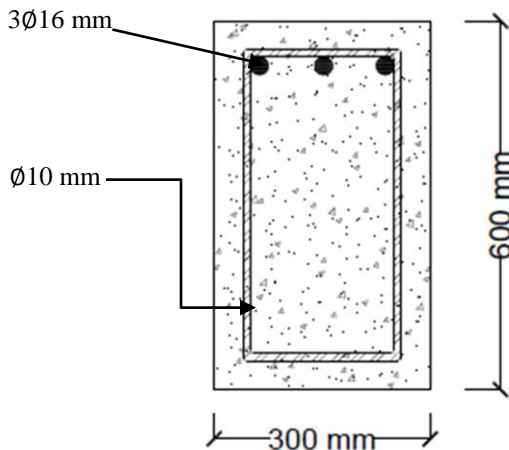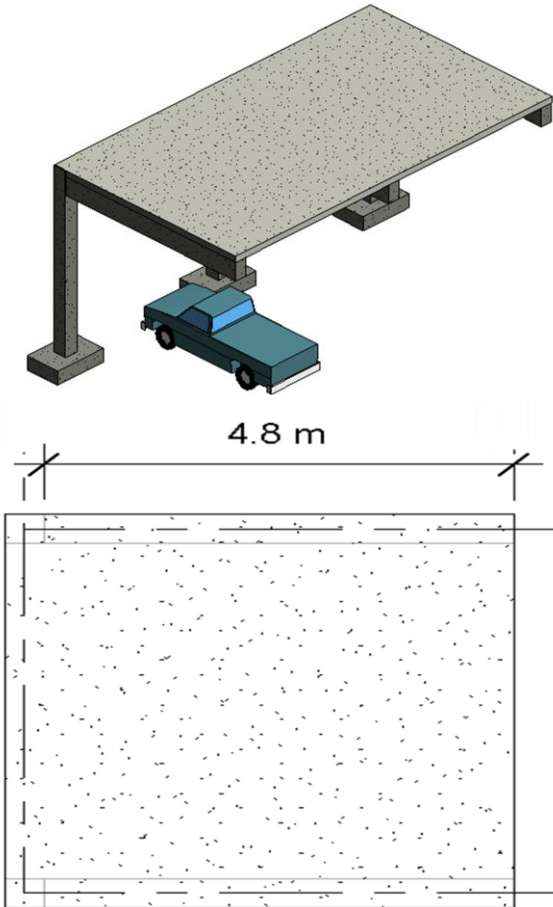**Civil Engineering Department**   **Stage: 3rd**

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.

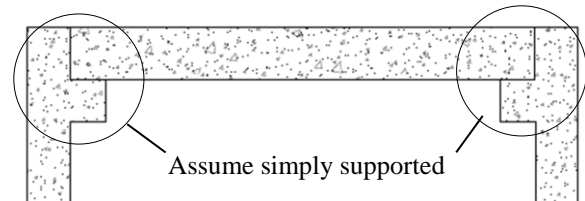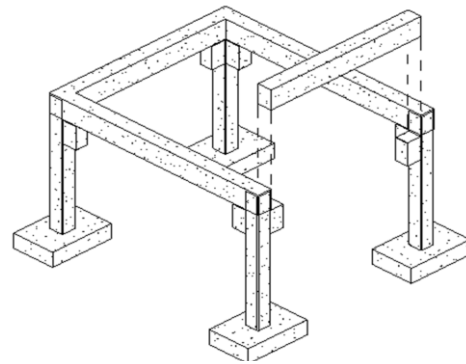**Q1** (50%): check the adequacy of the beam shown below according to ACI requirement. W_D=2.5 kN/m (including self-weight) and W_L=2.5 kN/m

4.8 m

3Ø16 mm

Ø10 mm

600 mm

300 mm

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

Assume that the designer intends to use:

- Mu = 350 kN.m
- Use $\rho = 0.5\ \rho_{max}$ and $\frac{d}{b}=3$
- Rebar diameter 20mm for longitudinal reinforcement.
- Rebar diameter 10mm for stirrups.
- Two layers of reinforcement.

Assume simply supported

Good luck