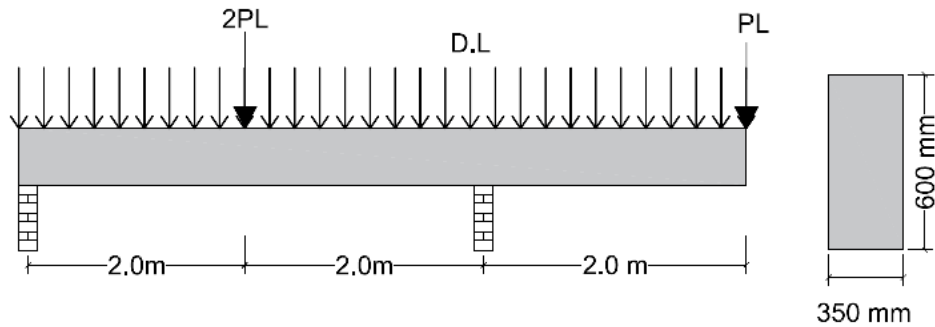
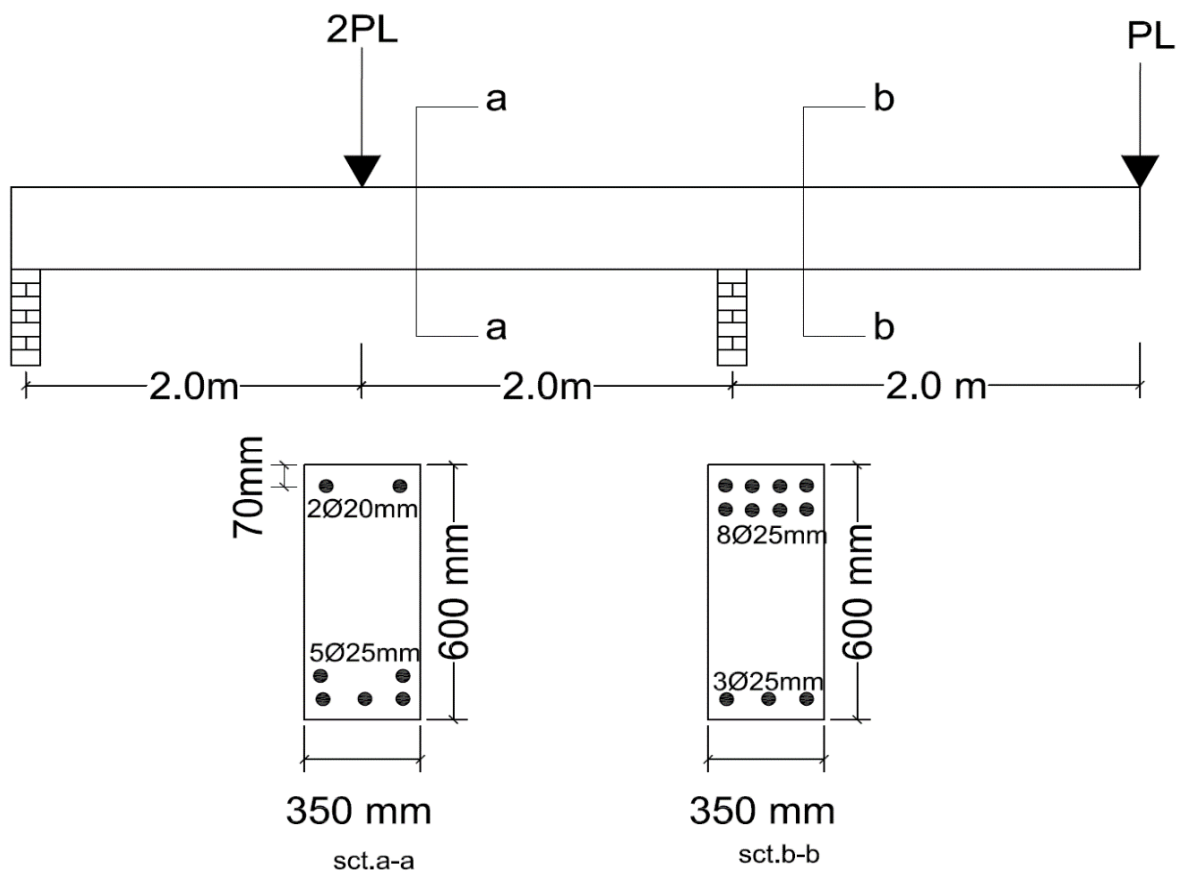


Q1- The beam of section and detail shown in Fig. support (D.L=25kN/m include its self-weight, PL=150kN) Use  $\frac{f'_c}{f_y} = \frac{35}{420} MPa$  &  $\varnothing 20mm$  as main reinforcement. Design the steel reinforcement required and Sketch sections and show detail. Ans. ( $A_s^+ = 1404mm^2$ ,  $A_s^- = 3007mm^2$ )



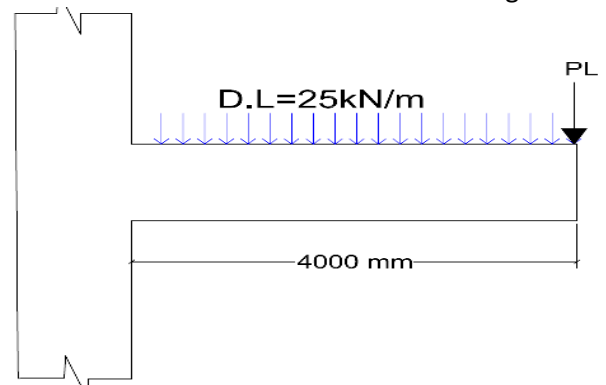
Q2-For the beam of sections and detail shown in Fig. find the maximum live load (PL) that the beam can be carry it. Neglect self-weight? Ans. PL=195.74 kN

Use  $\frac{f'_c}{f_y} = \frac{35}{420} MPa$



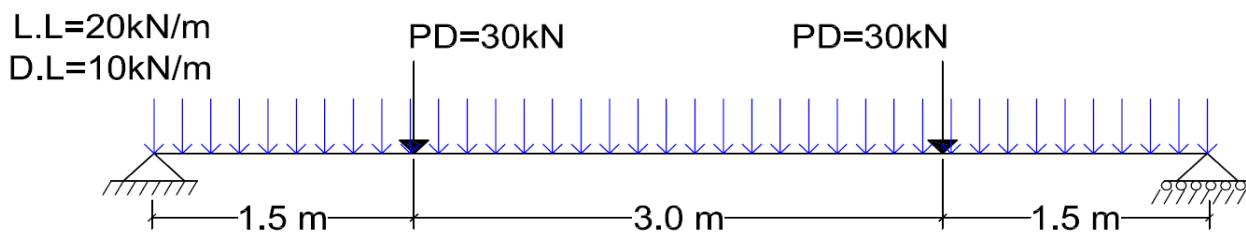
Q3-Design the reinforced concrete of detail shown in Fig. to support (D.L=25 kN/m, L.L=100kN) use  $f'_c = 30\text{MPa}$ ,  $f_y = 400\text{MPa}$

Ans.  $d=690\text{mm}$ ,  $b=350\text{mm}$  and  $A_s=4081\text{mm}^2$



Q4- A simply supported beam of rectangular section, support the load shown in Fig. Answer the following:

- 1- Design the section as minimum section and sketch it.
- 2- Design the section as maximum section and sketch it.
- 3- Design the section use  $\rho = 0.75 \rho_{max}$ .  
Use  $f'_c = 30\text{MPa}$ ,  $f_y = 400\text{MPa}$



Ans. 1-  $d=406\text{mm}$ ,  $A_s=2314\text{ mm}^2$ , 2-  $d=907\text{ mm}$ ,  $A_s=793.6\text{ mm}^2$  3-  $d=435\text{mm}$ ,  $A_s=1860\text{ mm}^2$

Q5-

Find the maximum live load can be carry by a simply supported beam having a span of 5 m and section shown in Fig.

If the uniform live load= 50kN/m can the beam carry the applied load.

Use  $f'_c = 28\text{MPa}$ ,  $f_y = 350\text{MPa}$ ,  $\gamma = 24 \frac{\text{kN}}{\text{m}^3}$ , D.L = self weight

Ans. L.L=36.6kN/m

