

### Answer all questions

**Q.1 (50%)** Find the minimum thickness of a slab for an interior panel due to deflection control for the following: Use  $f_y = 420 \text{ MPa}$ . (60000 psi).

- a- Slab with beams ( $8.2 \times 7.8$ ) m clear span with  $\alpha_m = 2.2$
- b- Slab without drop panels ( $5.4 \times 5.0$ ) m clear span with  $\alpha_m = 0.11$
- c- Flat plate ( $4.4 \times 4.6$ ) m clear span.
- d- Flat slab with drop panels ( $6.2 \times 6.2$ ) m clear span.
- e- Slab with beams ( $5.2 \times 5.8$ ) m clear span with  $\alpha_m = 1.7$

**Q.2 (50 %)** For the the transverse interior (Frame B) of the flat plate floor, without edge beams, shown in Figure, and by using the Direct Design Method, find:

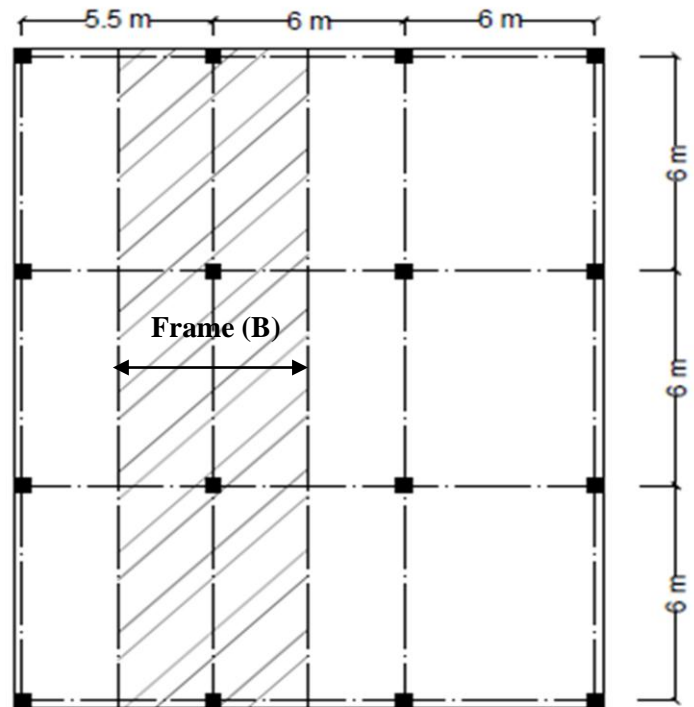
- a. Longitudinal distribution of the total static moment at factored loads.
- b. Lateral distribution of moment at interior and exterior panels (column and middle strip moments at negative and positive moments).

Slab thickness = 200 mm,  $d = 165 \text{ mm}$

$q_u = 17 \text{ kN/m}^2$

All columns =  $300 \times 300 \text{ mm}$

$f_c' = 25 \text{ MPa}$ ,  $f_y = 400 \text{ MPa}$



*Good Luck*