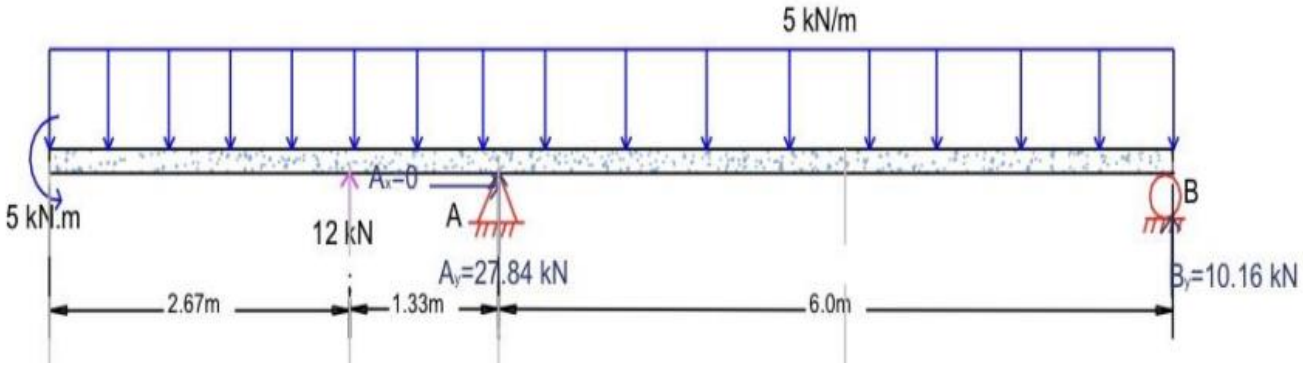
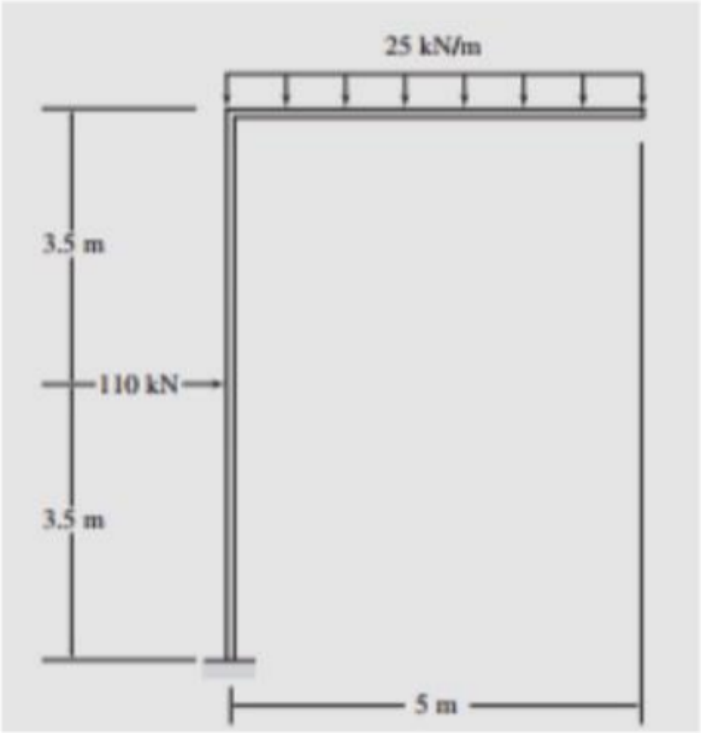
Subject (Elective): CSI ETABS SOFTWARE QUESTIONS



$E = 2 * 10^8 \frac{kN}{m^2}$ & $I = 1 * 10^{-4}\ m^4$

1. Draw Shear Force diagram of the beam
2. Determine the rotation at roller support
3. Find maximum negative moment of the beam
4. Find maximum shear force of the beam
5. Determine vertical displacement at simply support
6. Determine horizontal reaction at simply support
7. Determine vertical reaction at roller support



$E = 2 * 10^8 \frac{kN}{m^2}$ & $I = 1 * 10^{-4}\ m^4$

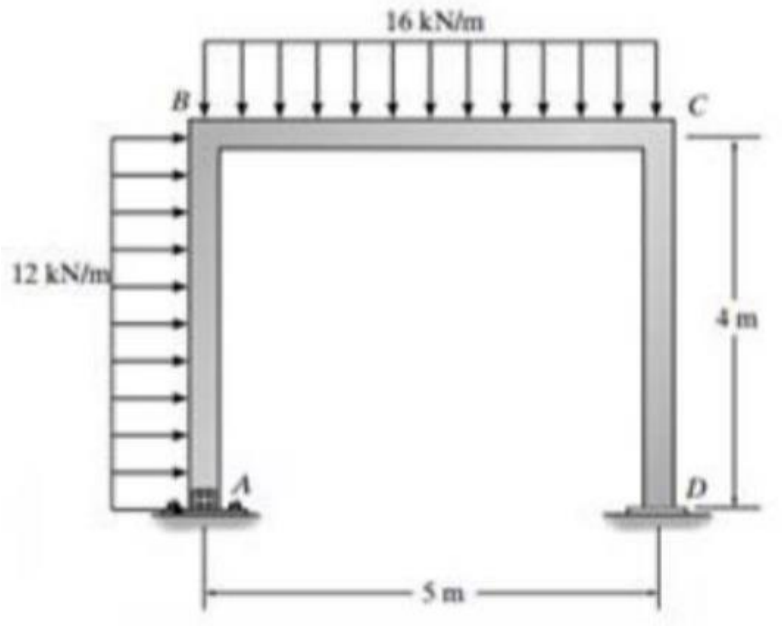
8. Determine reactions at fix support

9. Draw moment diagram of the frame

10. Draw axial load diagram of the frame

11. Find the rotation at support

12. Determine maximum shear force of the frame



$E = 2 * 10^8 \frac{kN}{m^2}$ & $I = 1 * 10^{-4}\ m^4$

13. Determine vertical reaction at support D

14. Determine Horizontal reaction at support A

15. Find maximum positive moment of the frame

16. Find maximum negative moment of the frame

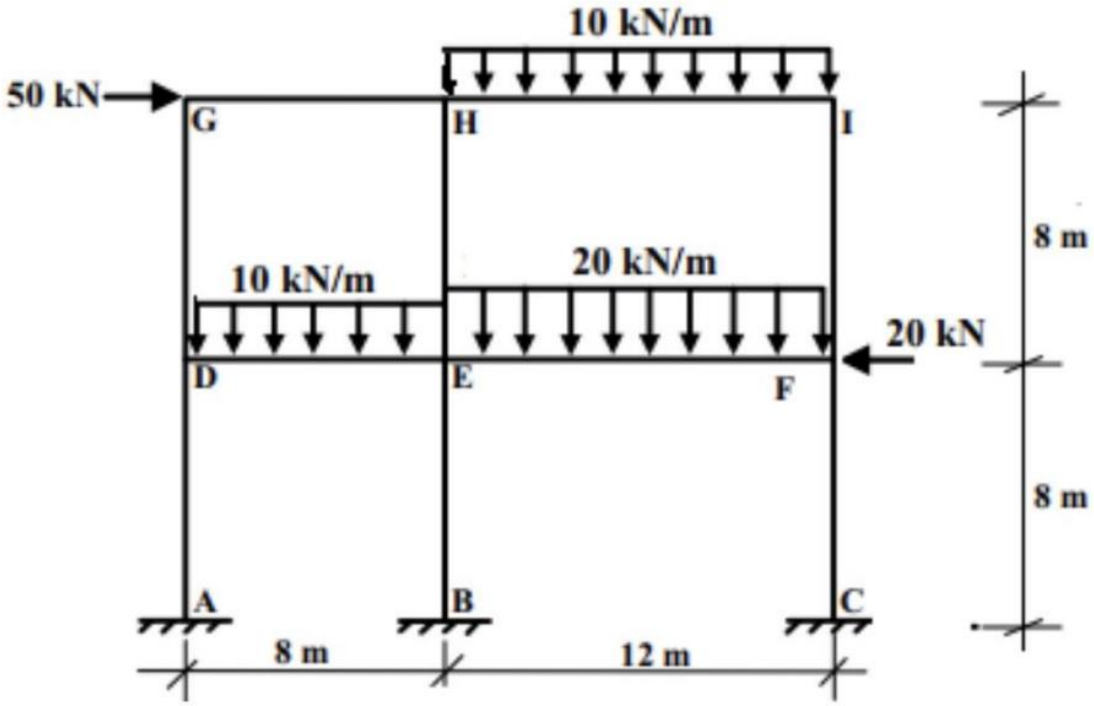
17. Find the horizontal displacement at point C

18. Find the rotation at point B

19. Draw the axial load diagram of the frame

20. Draw shear force diagram of member BC

21. Draw moment diagram of member CD



$E = 2 * 10^8 \frac{kN}{m^2}$ & $I = 1 * 10^{-4}\ m^4$

22. Find a moment at support B

23. Find the vertical reaction at point A

24. Find the horizontal reaction at point C

25. Determine the Horizontal displacement at point F

26. Determine the rotation of the joint G

27. Determine the vertical displacement of the member DE

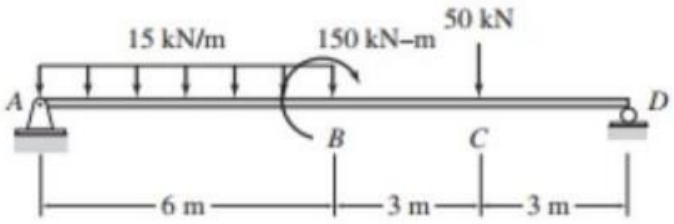
28. Find the maximum shear force of the frame

29. Draw the moment diagram of the frame

30. Draw the axial load diagram of the frame

31. Draw shear force diagram of the member EF

32. Determine the rotation of the joint E



$E = 2 * 10^8 \frac{kN}{m^2}$ & $I = 1 * 10^{-4}\ m^4$

33. Horizontal reaction at support A

34. Rotation of the roller support

35. Draw moment diagram of the beam

36. Determine reaction of the support D

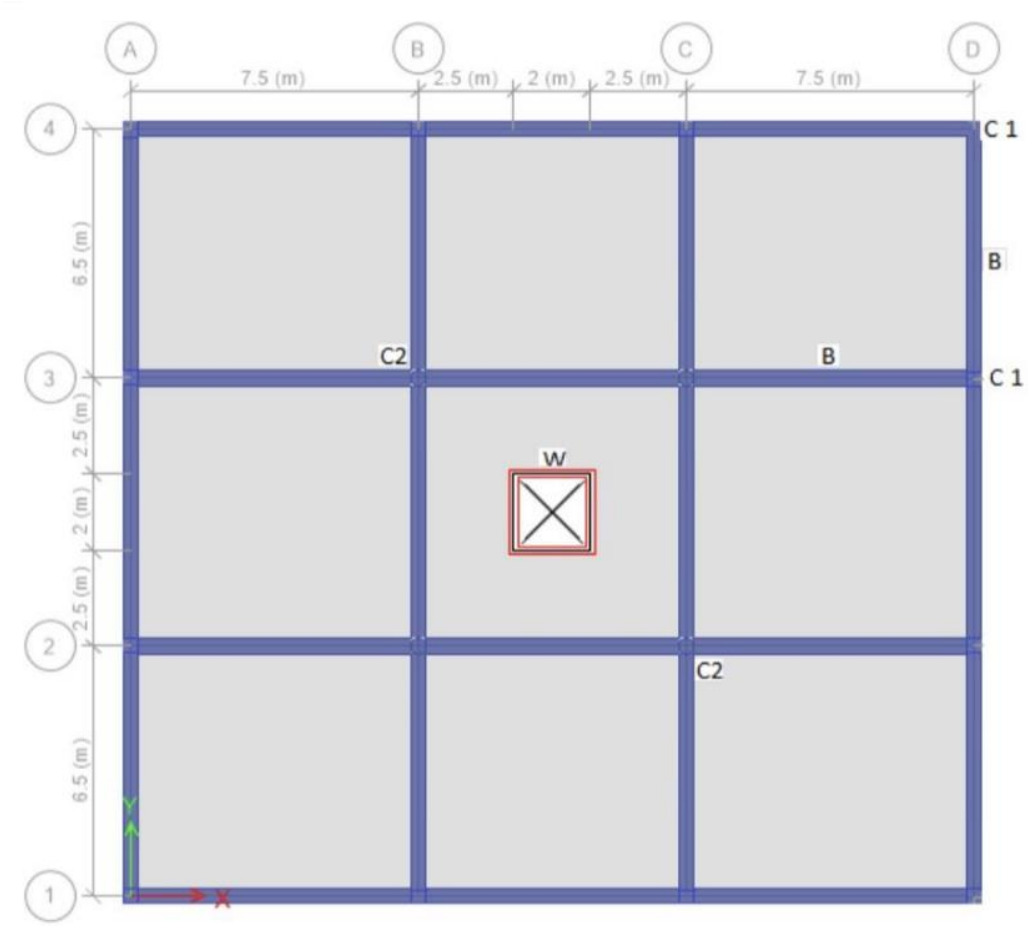
37. Vertical displacement of the support D

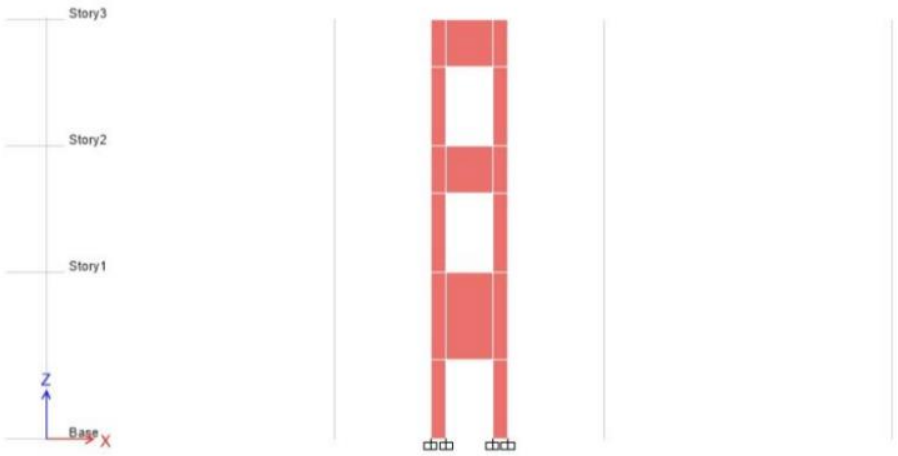
38. Draw shear force diagram of the beam

39. Rotation of the support A

40. Horizontal displacement of the support A

41. Typical plan of slab-beams and frame section shown below





42. Input data Given

Structural element	Dimension
Columns: **C 1** (Corner & Ext. columns.) **C 2** (int. columns.)	Square col. (0.4*0.4)m Circular col. (0.4m. Diameter.)
All beams (**B**)	(0.4Width*0.58Height)m,
Slab thickness (**S**)	0.18m
Shear walls thickness(**W**)	0.20m
No. of elevators (door opening)	1 (1.2*2)m,
Rectangular mesh setting for floors & walls	1.0m
No. of stories	3
Story height	4.2m for Ground floor 3.2m for Typical floors,
f'c (for all structure)	28 MPa
fy (for steel bars)	420 MPa
Uniform Super dead load for slabs	3.6 (kN/m^2)
Uniform Live load for floors - For corridors (interior panel) - For another panels **Uniform Live load for roof**	 4.0 (kN/m^2) 2.5 (kN/m^2) **2.0 (kN/m^2)**
Load combinations:	**Add default design combinations** **LL + DL**
Base supports : Fix	

Analysis and design of the building based on the clear length.

43. Create a model of a reinforced concrete resisting frame of 3 stories office building.

44. After Analysis the model, find the followings:

45. Find reaction at base support of joint (A-1) due to (1.2DL + 1.6 LL)

46. Find reaction at base support of joint (B-3) due to (DL+LL)

47. Draw the moment diagram of the beam (A1 – B1) at (GF) due to (1.4DL)

48. Draw the moment diagram of the beam (A2 – B2) at (2^{nd} F) due to (1.2DL+1.6LL)

49. Draw the shear force diagram of the beam (C2 – D2) at (1^{st} F) due to (1.2DL+1.6LL)

50. Draw the shear force diagram of the beam (A3 – B3) at (1^{st} F) due to (1.2DL+1.6LL)

51. Find the maximum torsion of the beam (C4 – D4) at (2^{nd} F) due to (1.2DL+1.6LL)

52. Find the maximum torsion of the beam (C3 – D3) at (G F) due to (1.4DL)

53. Find the maximum shear force of the beam (A4 – B4) at (G F) due to (1.4DL)

54. Find the maximum shear force of the beam (A3 – B3) at (1^{st} F) due to (1.2DL+1.6LL)

55. Find the maximum deflection of the beam (A2 – B2) at (2^{nd} F) due to (DL+LL)

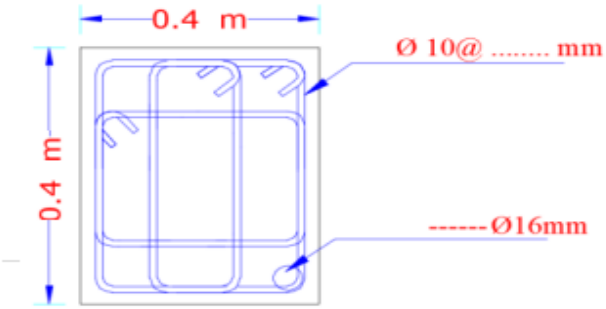
56. Find the maximum deflection of the beam (C1 – D1) at (1^{st} F) due to (1.2DL+1.6LL)

57. After Design the model, find the followings:

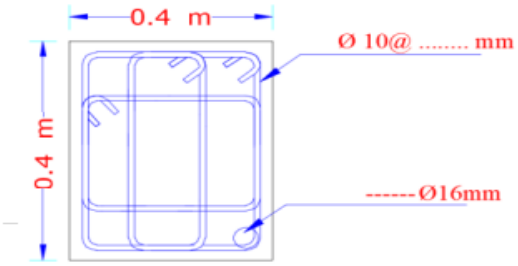
58. Maximum deflection and location (x , y) due to (1.2DL) → (2^{nd} F.)

59. Maximum deflection and location (x , y) due to (1.2DL) → (G F.)

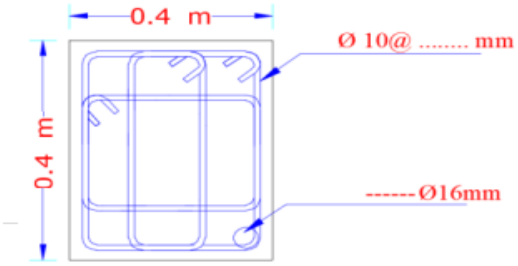
60. Design a longitudinal reinforcement bar of column [(B-4, GF) → due to (1.2 DL + 1.6 LL)]



61. Design a longitudinal reinforcement bar of column [(D-1, 2nd F) → due to (1.4DL)]



62. Design a longitudinal reinforcement bar of column [(A-4, 1st F) → due to (1.2DL+1.6LL)]



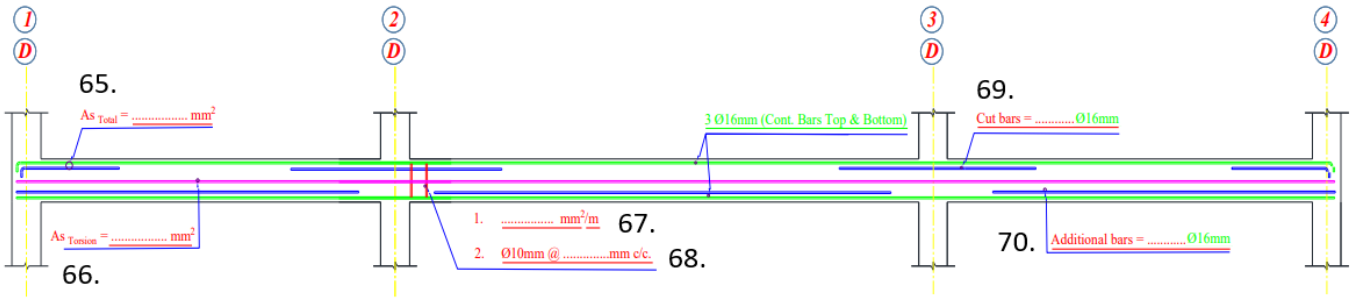
63. For beam reinforcement → (Ground Floor)

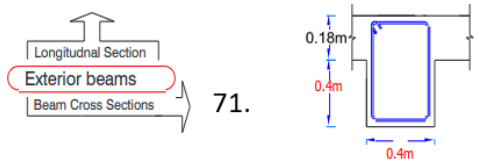
Fill the missing data of a longitudinal section for the beams as shown in Fig. and draw transverse structural section

For beam → As $_{min.}$= $\frac{1.4}{fy}\ bd$ or $\frac{\sqrt{fc'}}{4\ fy}\ bd$, (Use: d = h - 70mm).

(Φ25 → A_b=490mm^2), (Φ20→ A_b=314mm^2), (Φ16→ A_b=201mm^2), (Φ12→ A_b=113mm^2) & (Φ10→ A_b=71mm^2)

64.





71.