KATHMANDU UNIVERISTY
End Semester Examination
May/June, 2022

Level : B.E.
Year : III
Time : 2 hrs. 30 mins.

Course : CIEG 318
Semester : II
F.M. : 40

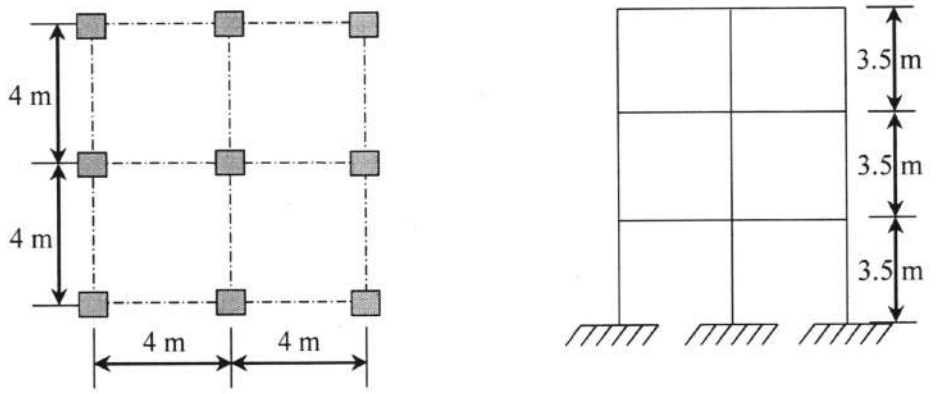
SECTION "B"
[5Q. × 8 = 40 marks]

Attempt *ALL* questions. Assume data is necessary.
Use of IS1893 (Part I) – 2002 is allowed.

1. a. Explain the plate tectonics theory and its mechanisms. [4]

   b. How is the location of an earthquake identified preliminary? Explain. [4]

2. The plan and elevation of a three – storey RCC school building is shown in Figure 1. The building is located in high seismic zone. The type of soil encountered is medium stiff and it is proposed to design the building with a special moment resisting frame. The intensity of dead load is 10 kN/m^2 and the floors are to cater to an imposed load of 3 kN/m^2. Determine the design seismic loads on the structure by static analysis. [8]



Plan Elevation

Figure 1

3. a. A harmonic oscillation test gave the natural frequency of a water tower to be 0.41 Hz. Given that the mass of the tank is 100 tonnes, what deflection will result if a 60 kN horizontal load is applied? You may neglect the mass of the tower. [4]

   b. How does architectural features affect buildings during an earthquake? [4]

4. For one storey building with rigid floor diaphragm 500 kN lateral load acts at storey level along X – Direction as shown in Figure 2. Uniform distribution of load on the floor is indicated in the Figure 2. Calculate the lateral force in the individual lateral load resisting elements. [8]

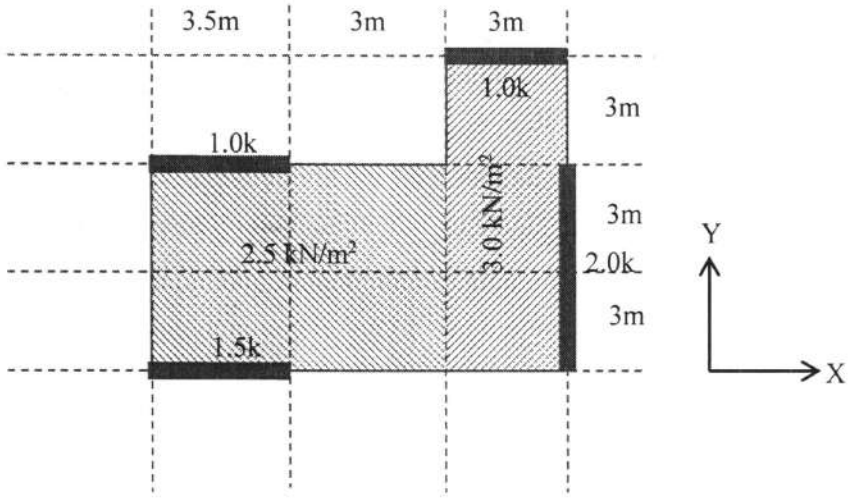


Figure 2

5. Obtain the bending moment diagram, shear force diagram and axial force diagram for the plane frame shown in the Figure 3, using portal frame method. [8]

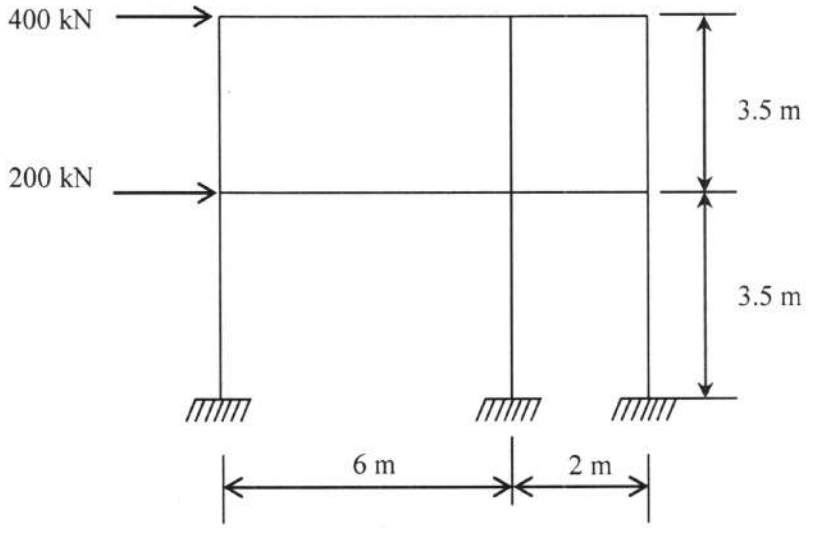


Figure 3