

B. Tech Degree VII Semester (Supplementary) Examination July 2010

CE 703 A/B EARTHQUAKE ENGINEERING (2006 Scheme)

Time : 3 Hours

Maximum Marks : 100

PART A

Answer ALL questions)

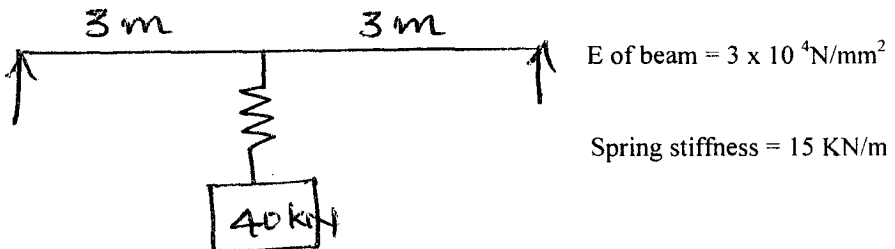
(8 x 5 = 40)

- I. (a) How the earthquake ground motion characteristics are studied?
 (b) What is meant by intensity of earthquake and magnitude of earthquake? Give brief description on different scales for intensity and magnitude.
 (c) What is soft storey? Explain its effect during earthquake.
 (d) Explain the term fundamental period and mode shapes.
 (e) Derive the basic equation for response of free vibration of viscous damped SDOF systems.
 (f) What is seismic base isolation? Explain.
 (g) Draw the response of an over damped, critically damped and under damped SDOF systems.
 (h) Explain the importance of ductility requirement in earthquake resistant design.

PART B

(4 x 15=60)

- II. a. What are the factors considered in understanding the nature of strong motions? Explain. (8)
 b. What are the uses of strong motion data? (7)
- OR**
- III. Explain the terms – accelerogram, amplitude, duration, response spectrum and design spectrum as applied to earthquake studies. (15)
- IV. What are the different types of irregularities in building? Explain critically the effect of each irregularity on the performance of building during earthquake. (15)
- OR**
- V. Explain the various aspects which are to be considered during the planning of seismic resistant building. (15)
- VI. Derive the response of SDOF system subjected to harmonic excitation. (15)
- OR**
- VII. a. Explain any two methods to calculate damping coefficient. (8)
 b. Compute natural frequency and period of the structure neglecting beam self weight. (7)

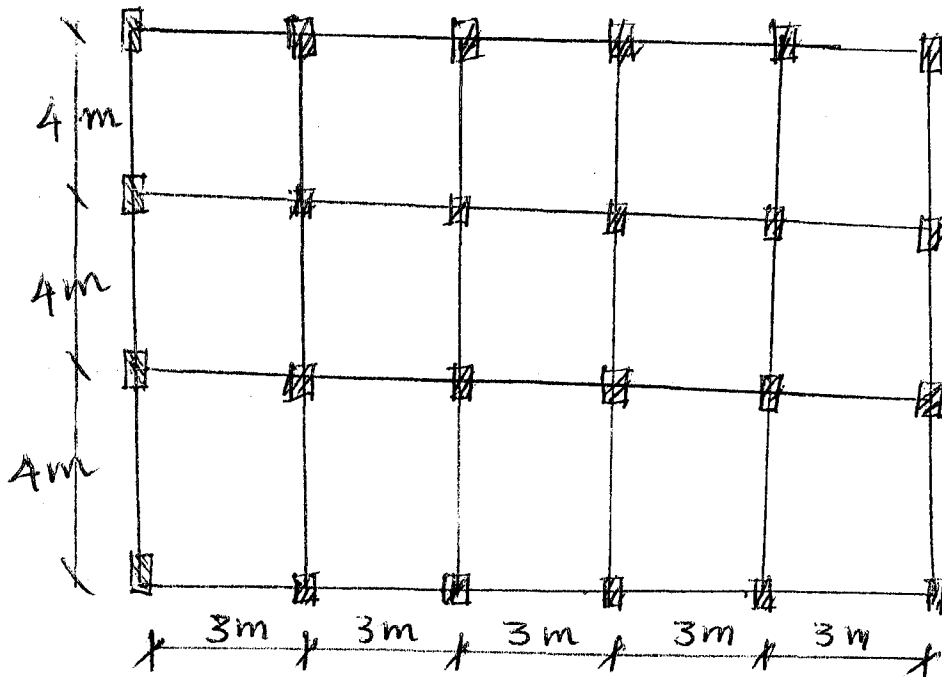


(P.T.O)

VIII.

Determine the static equivalent of earthquake forces on the five storey office building shown in figure. The building is located at Cochin and the foundation is on hard rock. The floors and roof are to be designed for a live load of 4 kN/m^2 and 2 kN/m^2 respectively. The lumped weight due to dead load is 10 kN/m^2 on all floors and roof. [Any assumption made during calculation should be indicated clearly].

(15)



Plan

Height of 1st floor from foundation - 4 m

Height of upper floors - 3 m

OR

IX.

With neat sketches explain the ductility requirement considerations based on IS 13920 on earthquake resistant design of

- (i) Flexural members
- (ii) Columns
- (iii) Column – beam joints.

(15)