

Seat No.	
-------------	--

B.E. (Civil) (Part-I) (Semester-VII) Examination, Dec. - 2013**EARTHQUAKE ENGINEERING (Revised) (New)****Sub. Code : 47903**

Day and Date : Saturday, 07 - 12 - 2013

Total Marks : 100

Time : 2.30 p.m. to 5.30 p.m.

- Instructions :
- 1) Attempt any three questions from each section.
 - 2) Use of non-programmable scientific calculator and only IS 1893 (Part - I): 2002 is allowed.
 - 3) Figures to the right indicate full marks.
 - 4) Assume suitable data if necessary and mention it clearly.

SECTION - I

- Q1) a) Explain how subduction zones forms and what occurs at such a plate boundary? [5]
- b) Write a note on Modified Mercalli scale. [5]
- c) Classify different types of earthquakes. [6]
- Q2) a) Draw the response graph of undamped free vibration SDOF system. Hence explain initial displacement, initial velocity, phase lag, period and amplitude. [6]
- b) A dynamic system has maximum velocity of 200 mm/s and the natural period of 1 s. If the initial displacement is 10 mm, determine the amplitude, initial velocity and maximum acceleration. [10]
- Q3) a) Explain logarithmic decrement with help of response graph. [5]
- b) An SDOF system consists of mass with weight 6 kN and spring with stiffness 5 N/mm. The system has the damping force of 200 N with a velocity of 250 mm/s. Find the damping ratio and damped frequency and ratio of two consecutive amplitudes. [12]

P.T.O.

- Q4) A three storied hospital building is constructed as per the recommendations of IS:13920. The plan of building is as shown in Fig.1 and the storey height is 3.0 m. The dead load per unit area of the floor, consisting of the floor slab, finishes, etc., is 4 kN/m^2 . Weight of partitions on the floor can be assumed to be 2 kN/m^2 . The intensity of live load on each floor is 3.5 kN/m^2 . The soil below the foundation is hard and the building is located in Delhi. Determine the seismic forces and shears at different floor levels. Size of columns is $300 \text{ mm} \times 300 \text{ mm}$ and of beams is $300 \text{ mm} \times 600 \text{ mm}$. [17]

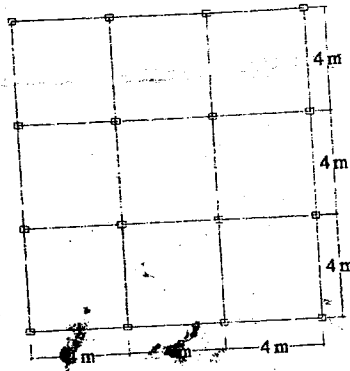


Fig. 1

SECTION - II

- Q5) a) Write note on special confining reinforcement and its significance including the provisions for the same in IS:13920. [8]
 b) State the reasons for the poor performances of masonry buildings in seismic areas. [9]
- Q6) a) Write note on timber shear panel construction. [8]
 b) Describe with help of neat sketches strengthening of RCC beams and columns. [8]
- Q7) a) What is the importance of transverse reinforcement in RCC elements? What are the IS code provisions? [8]
 b) What is the importance of bond between reinforcing bars and concrete? Due to lack of bond which part of RCC is most affect? How? [8]
- Q8) a) Why the thick stone masonry separate in two layers during earthquake? How it is to be avoided? [8]
 b) Write note on Grouting, Guniting and Prestressing of masonry walls. [9]