

FACULTY OF ENGINEERING

B.E. 4/4 (Civil) I – Semester (Main) Examination, December 2011

Subject: **Elements of Earthquake Engineering**

(Elective - I)

Time: 3 Hours

Max. Marks: 75

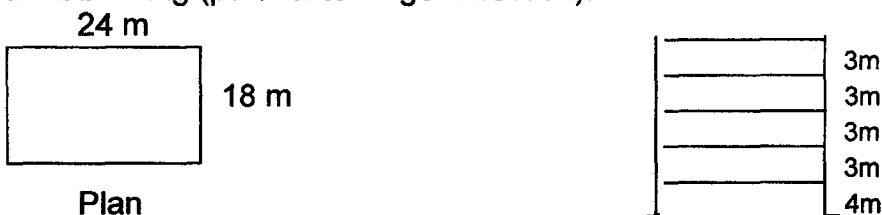
Note: Answer all questions from Part A. Answer any Five questions from Part B. Use of IS 1893 is permitted. Any missing data may be suitably assumed.

PART – A (25 Marks)

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|-----|--|---|
| 1. | What is intensity of an earthquake and how is it estimated? | 3 |
| 2. | How is ductility effect incorporated in response reduction factor? | 3 |
| 3. | What is an undamped system? | 3 |
| 4. | Write about soil effects on seismic response of a structure. | 3 |
| 5. | Write about base isolation. | 3 |
| 6. | What is out of plane failure in masonry structures? | 2 |
| 7. | Explain body waves in seismic wave propagation. | 2 |
| 8. | What is resonance and when does it occur? | 2 |
| 9. | List some severe earthquakes that occurred in the last 10 years. | 2 |
| 10. | Write the importance of lintel band in masonry structures. | 2 |

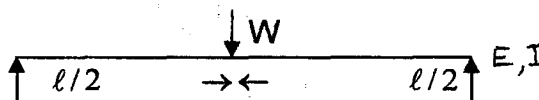
PART – B (50 Marks)

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|--------|---|----|
| 11.(a) | Write source effect and path effect on ground motion. | 6 |
| (b) | Explain about liquefaction. | 4 |
| 12. | Deduce an expression for the response of a single degree of freedom undamped system subjected to harmonic loading. | 10 |
| 13. | Estimate the seismic loads on the building shown below using seismic coefficient building (parallel to longer direction). | 10 |



Consider a distributed load of 15 KN / m^2 on all the slabs (other loads need not be considered).

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|--------|---|---|
| 14.(a) | What do you mean by modal analysis? | 5 |
| (b) | Find the natural frequency of the following system. | 5 |



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|-----|---|----|
| 15. | Compare the earthquake effects of Bhuj earthquake and Kilarri earthquake. | 10 |
| 16. | Give a brief account of seismic retrofitting of RC buildings. | 10 |
| 17. | Write short notes on | |
| | a) Viscous dampers | 4 |
| | b) Strong column weak beam theory | 2 |