



22606

12223

3 Hours / 70 Marks

Seat No.

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- Instructions :**
- (1) All Questions are *compulsory*.
 - (2) Answer each next main Question on a new page.
 - (3) Illustrate your answers with neat sketches wherever necessary.
 - (4) Figures to the right indicate full marks.
 - (5) Assume suitable data, if necessary.
 - (6) Use of Non-programmable Electronic Pocket Calculator is permissible.
 - (7) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. Attempt any FIVE :

10

- (a) Define : (i) Magnitude of earthquake and (ii) Intensity of earthquake
- (b) Differentiate between P-waves and S-waves. (Any two points of difference.)
- (c) Define structural response factor and state any two factors on which it depends.
- (d) State any four causes of earthquakes.
- (e) Define : (i) Storey drift and (ii) Storey shear
- (f) State any two causes of damage in stone masonry due to earthquake.
- (g) Give the expression for computing design base shear along any principal direction.

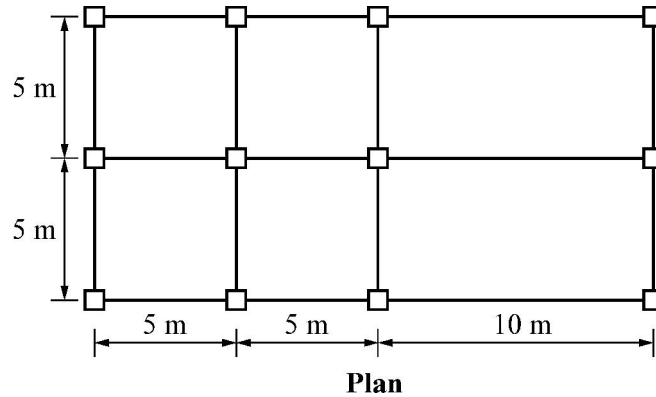


- 2. Attempt any THREE :** **12**
- (a) Describe different safety measures required to minimize the damage when earthquake hits.
 - (b) Explain method of measurement of earthquake shaking and its working principle.
 - (c) Enlist the major tectonic plates of the earth and state the three chief tectonic sub-regions of India.
 - (d) Explain the following types of earthquake and faults with one example of each – (i) Inter plate earthquake and (ii) Intra plate earthquake
- 3. Attempt any THREE :** **12**
- (a) State criterion for site selection for constructing earthquake resistant building soil strata with justification.
 - (b) Explain typical damage and failure of stone masonry due to earthquake.
 - (c) Draw typical sketch showing details of transverse reinforcement of beams with all notations.
 - (d) State any four learning from Killari (Latur) earthquake.
- 4. Attempt any THREE :** **12**
- (a) State the assumptions made in the earthquake resistant design of structures.
 - (b) Explain the provisions of I.S. 4326 to improve seismic behaviour of masonry buildings.
 - (c) State the meaning of ductile detailing and explain the need of ductility in concrete structure.
 - (d) List methods of lateral load analysis and explain any one.
 - (e) State the general specifications for longitudinal reinforcement and transverse reinforcement of column as per I.S. 13920.

5. Attempt any TWO :

12

- (a) Explain elastic rebound theory with neat sketch.
- (b) The plan of a simple one storey building is shown in fig. All columns and beams are of same size. Obtain its centre of stiffness.



- (c) Explain in detail the different vertical irregularities.

6. Attempt any TWO :

12

- (a) Distinguish between behaviour of R.C.C. buildings in detail under (i) Gravity loading and (ii) Earthquake loading.
- (b) State the possible damages and failures in R.C.C. buildings due to earthquake.
- (c) Suggest with justification any six precautions to be taken in design and construction of buildings in earthquake affected zone.
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