

22606

21222

3 Hours / 70 Marks

Seat No.

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15 minutes extra for each hour

- 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 focal depth and foreshock.
- (b) State the meaning of magnitude of earthquake.
- (c) Define body waves and enlist its two types.
- (d) State the use of seismic zoning map of India.
- (e) State the meaning of Soft Storey Effect.
- (f) Enlist any two damages in stone masonry structures due to earthquake.
- (g) State any two I.S. Codes used in earthquake resistant design of structures.

2. Attempt any THREE :

12

- (a) Explain the working principle of Richter scale.
- (b) Suggest any four guidelines for earthquake preparedness.
- (c) Explain elastic rebound theory.
- (d) Explain any four effects of tsunami.

- 3. Attempt any THREE :** **12**
- (a) Explain planning aspect of building regarding earthquake resistance.
 - (b) Explain the causes of damages in stone masonry.
 - (c) State the meaning of ductility and explain necessity of ductile detailing for earthquake resistant structure.
 - (d) State the learning from past earthquakes such as Killari, Bhuj (Any four points).
- 4. Attempt any THREE :** **12**
- (a) Draw typical sketch showing details of transverse reinforcement in beams with ductile detailing.
 - (b) State any four general principles for design of earthquake resistant masonry buildings.
 - (c) Suggest action plan required to handle the probable earthquake in Latur area with minimum four points.
 - (d) State any four assumptions in design of earthquake resistant buildings.
 - (e) Explain the effect of given geometric shape on the damages due to earthquake for the given zone.
- 5. Attempt any TWO :** **12**
- (a) Explain three types of earthquakes with their causes.
 - (b) Enlist any four types of tectonic plates and explain movement of Indo-Australian plate with sketch.
 - (c) Suggest criteria to be considered in selecting site for earthquake resistant building against loose sand and stability of slopes.
- 6. Attempt any TWO :** **12**
- (a) Identify probable damages to brick masonry with failure pattern due to earthquake.
 - (b) Draw sketches of any three damages in R.C.C. building due to earthquake.
 - (c) Suggest action plan required to restore roads and bridges in working condition after severe earthquake.
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