



मातृ - 010

## Earthquake Resistant Design of Buildings (1090)

P. Pages : 2

Time : Four Hours

Max. Marks : 100

Instructions to Candidates :

1. Do not write anything on question paper except Seat No.
2. Answer sheet should be written with blue ink only. Graph or diagram should be drawn with the same pen being used for writing paper or black HB pencil.
3. Students should note, no supplement will be provided.

1. a) What is meant by the focus and epicentre of an earthquake ? 10  
Name the two kinds of waves and explain how they differ.
- b) Write short note on **any two**. 10
  - i) Sesmic waves.
  - ii) Earth's mantle.
  - iii) Subdeduction zone.
2. a) Write short note on **any two**. 10
  - i) d' Alembert's principle.
  - ii) Hamilton's principle.
  - iii) Uncertainties of dynamic analysis.
- b) Give the merits and demerits of three techniques of modelling structures. 10
3. a) What are the measures taken to reduce the possibility of liquefaction. 10

- b) Write short note on **any two**.
- i) Dynamic soil parameters.
  - ii) Settlement of Dry sands.
  - iii) Soil amplification.
4. a) In what way the earthquake resistance of structure affected by **10**
- i) Non symmetry and
  - ii) elongated shape of buildings.
- b) The architect and the structural Engineer must co-ordinate at the planning stage of building structure. Comment. **10**
5. a) If a building is to be constructed on the slope of a hilly area, what precautions will have to be exercised during planning of the building to avoid twisting ? **10**
- b) Discuss the ways and means to prevent an earth quake force from acting on the super structure of a building. **10**
6. a) Discuss the behaviour of following masonry walls in seismic regions. **10**
- i) Unreinforced masonry walls.
  - ii) Reinforced masonry walls.
  - iii) Infill walls.
- b) What are the various methods of restoring an earth-quake damaged masonry building. **10**
7. Discuss briefly the following types of failures of R.C.C. buildings. **20**
- a) Ductile failure.
  - b) Flexural Failure.
  - c) Failure of Joints.
  - d) Buckling of reinforcing bars.

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