

**R15**

Code No: 126ZB

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year II Semester Examinations, April - 2018

ELEMENTS OF EARTHQUAKE ENGINEERING

(Civil Engineering)

Time: 3 hours

Max. Marks: 75

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

Note: Use IS1893, 13920 is allowed

**PART - A**

(25 Marks)

- 1.a) Draw the sketch of interior of earth showing the parts. [2]
- b) Describe zones of Convergence. [3]
- c) List the basic factors contributing to the proper seismic behavior of building. [2]
- d) List the factors involved in an adequate earthquake resistant design for a structure. [3]
- e) Why cold worked steel is not used in earthquake resistant building structures. [2]
- f) List any three damages to RCC buildings. [3]
- g) List the categories of masonry buildings as per IS4326:1993. [2]
- h) With the help of sketch show how the box action is achieved in a masonry building. [3]
- i) Describe the Non-structural elements. [2]
- j) List out the architectural components of a building. [3]

**PART - B**

(50 Marks)

- 2.a) Define earthquake and write the causes of earthquake. [5+5]
- b) Discuss about analysis of earthquake waves. [5+5]
- OR
- 3.a) Discuss about elastic vibration of simple structures. [5+5]
- b) Explain about non steady state forced vibrations. [5+5]
- 4.a) Discuss about seismic design coefficient. [5+5]
- b) Write about Dynamic analysis procedure. [5+5]
- OR
5. Explain about Stiffness and Strength in conceptual design. [10]
6. What are the principles of earthquake resistant design of RCC buildings? [10]
- OR
7. Describe with the help of neat sketches, restoration and strengthening of RCC beams and columns. [10]

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8. Describe the various earthquake-resistant features that can be introduced in masonry building to make it earthquake resistant. [10]

OR

9. For a room of 8 m × 4 m internal dimensions, the walls are constructed with 200mm thick modular bricks, having wall thickness 300mm in cement mortar 1:6. The load on the roof is 8kN/m<sup>2</sup>. Check the long wall for vertical bending and design the R.C.C lintel band for the given data.

Design seismic coefficient = 0.10; Height of wall = 4.2m

Lintel height from plinth = 2.4m; Unit weight of masonry = 20kN/m<sup>3</sup>.

[10]

10.a) List out the consequences of the failure of the Non-structural elements.

b) Discuss briefly the effect of a structural system on the behavior of a Non-structure.

[5+5]

OR

11.a) Explain clearly the cantilever walls without openings.

b) Explain the concept strong column and weak beams.

[5+5]

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