Total No. of Questions : 8]

SEAT No. :

P4418

[Total No. of Pages :2

[4860]-1035

M.E. (Civil) (Structures)

EARTHQUAKE ENGINEERING AND DISASTER MANAGEMENT

(601013) (2013 Credit Pattern) (Semester -III)

Time : 3 Hours] *[Max. Marks : 50*

Instructions to the candidates:

1) ***Answer any five questions.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right side indicate full marks.***
4) ***Use of non programmable electronic calculator is allowed.***
5) ***Assume suitable data if necessary.***
6) ***Use of IS 1893 - 2002 (part- I) and IS 13920 - 1993 is permitted.***

Q1) a) What are the Natural and Man Made Disasters. Explain Volcanoes and Tsunami and Blast. **[5]**

b) Distinguish between Rayleigh waves and Love waves. **[5]**

Q2) Write a note on **[10]**

a) Effect of earthquake on structural elements.

b) Direct and Indirect effects of earthquake.

Q3) A four storied square RC framed building shown in Fig. 1 with live load 4 kN/m^2 is to be constructed in Surat. Work out seismic forces on the structure by seismic coefficient method using IS 1893. All beams and columns size 300 mm × 400 mm. Thickness of roof and floor slab 120 mm thick. Wall is of 150 mm thick all around. Height of each floor 3m. Density of concrete 25 kN/m^3. The c/c distance between two frames is 8m. **[10]**

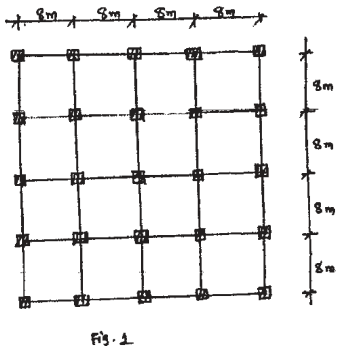

Fig. 1

P.T.O.

Q4) A plain concrete wall of dimensions 8m high , 6m long and 200mm thick is restrained against rotation at its base and unrestrained at the ends. If it has to carry a factored total gravity load of 200 kN and a factored horizontal load of 8 kN at top. Check the safety of the wall. Assume f_{ck} = 25, f_y = 500. in Mpa. **[10]**

Q5) a) Write a note on effect of blast loading on above ground structures. **[5]**

b) Define: **[5]**

i) Blast wind.

ii) Clearance Time.

iii) Drag Force.

iv) Ground Zero.

v) Side- on Overpressure.

Q6) Discuss the effect bomb blast loading and strong ground motion on structures. Compare their action and remedies. **[10]**

Q7) Write a note on any two: **[10]**

a) Fire loads and fire resistance Level.

b) Period of Structural Adequacy (PSA).

c) Methods of fire protection.

Q8) a) Explain the method of seismic base isolation. **[5]**

b) Explain the following methods of retrofitting of masonry walls (Any Two). **[5]**

i) Splint and bandage technique.

ii) Prestressing of masonry.

iii) Using FRP fabric.

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