Total No. of Questions : 8]

SEAT No. :

P4020

[Total No. of Pages : 3

[5255]-517

M.E. (Civil-Structure Engg.)

EARTHQUAKE ENGINEERING AND DISASTER MANAGEMENT

(2013 Credit Course) (Semester - III)

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

Instruction to the candidates:

1) ***Attempt Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6 and Q. 7 or Q. 8.***
2) ***Neat diagram must be drawn wherever necessary.***
3) ***Figure to the right indicates full marks.***
4) ***Assume suitable data, if necessary and clearly state.***
5) ***Use of cell phone is prohibited in the examination hall.***
6) ***Use of electronic pocket calculator is allowed.***
7) ***IS 456, IS 1893, IS 13920 are allowed in the examination***

Q1) a) What are the different phases involved in disaster management? Explain each in brief? **[4]**

b) What do you mean by pre disaster and post disaster activities? Explain each with suitable example? **[5]**

OR

Q2) a) What are different types of Disaster? What are the different stages of disaster management? Explain each stage in brief? **[5]**

b) Why and how the modern disaster manager is involved in pre disaster and post disaster activities? **[4]**

Q3) a) Design the reinforcement for a column of size 450mm X 450mm subjected to DL = l000kN, LL = 800kN and EL= 550kN along with Moment due to DL, LL, EL as 50kN.m, 40 kN.m and 100 kN.m respectively. The column has an unsupported length of 3.0 m and is braced against side sway in both directions. Use M25 grade concrete and Fe415 steel. **[5]**

b) What are the causes of instability of steel buildings? Discuss in detail the P-δ effect? **[4]**

OR

P.T.O.

Q4) a) Determine lateral forces at different storey levels for a plan of fourstorey school building as shown in Figure 4.1. Assume D.L. = 5kN/m^2, L.L. = 4kN/m^2 on each floor and 1.5 kN/m^2 on roof. Assume floor height 4m for ground and 3m for remaining storey with soil type hard and seismic zone III. **[5]**

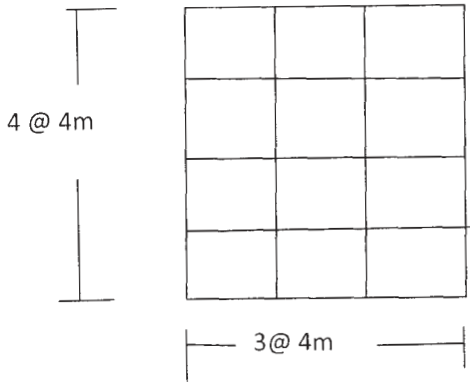

Figure 4.1

b) Discuss the advantages and disadvantages of different types of steel frames that can be provided in a steel building in an earthquake prone region. **[4]**

Q5) a) Discuss the effect bomb blast loading and strong ground motion on structures. Compare their action and remedies? **[8]**

b) Define load mass factor. Explain the procedure to find the load mass factor K_{LM} for a single storey rigid frame with distributed masses on the roof and sides is subjected to a concentrated dynamic force $F_{(t)}$, at the roof level plus a distributed dynamic load p(t) on one wall surface. **[8]**

OR

Q6) a) Define : (Any four) **[8]**

i) Blast Wind

ii) Clearance Time

iii) Drag Force

iv) Ground Zero

v) Side-on Overpressure

b) Write a note on general characteristics of Blast. Explain with proper sketch, shock wave propagation and how the pressure is developed at any surface of a structure? **[8]**

Q7) a) Write a note on any two **[8]**

i) Fire loads and fire resistance Level

ii) Period of Structural Adequacy (PSA)

iii) Methods of fire protection

b) Explain in detail the analysis of steel structure for fire loading along with the design consideration of structural steel members as per IS 800: 2007.**[8]**

OR

Q8) a) Explain various techniques for local retrofitting of RC buildings? Give reasons for poor performance of masonry buildings? **[8]**

b) Explain any three retrofitting techniques used for masonry buildings?**[8]**

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