Total No. of Questions : 6]

SEAT No. :

P263

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Oct.-16/BE/Insem.-112
B.E. (Civil) (Semester - I)
EARTHQUAKE ENGINEERING
(2012 Pattern)

Time : 1 Hour] *[Max. Marks : 30*

Instructions to the candidates:

1) ***Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6.***
2) ***Use of IS456-2000, IS 1893-2002 and non-programmable Calculator is allowed.***
3) ***Neat diagram must be drawn wherever necessary.***
4) ***Mere reproduction from IS code as answers will not be given full credit.***
5) ***Assume suitable data wherever necessary.***

Q1) a) Name the major plates of earth and explain Plate Tectonic Theory? **[5]**

b) What is an earthquake? Classify earthquakes based on different parameters? **[5]**

OR

Q2) a) Define following terms associated with earthquakes : **[5]**

i) Focus ii) Epicentre

iii) Seismogram iv) Magnitude

v) Isoseismal

b) Enlist past earthquakes and discuss lessons learnt from damages in these in earthquakes? **[5]**

Q3) a) What do you mean by critically damped, over damped and under damped Systems along with example of each? **[4]**

b) A vibrating system consists of mass 5kg, spring of constant 120N/m and a damper with damping coefficient 5 N-s/m. Determine : **[6]**

i) Damping factor ii) Damped natural frequency

iii) Logarithmic decrement iv) ratio of successive amplitudes

OR

P.T.O.

Q4) a) Write down the equation of motion for SDOF subjected to Un-damped free vibrations and obtain solution for them? **[4]**

b) Obtain natural frequencies of the two storey shear frame having equal lateral stiffness 'k' at each storey and equal lumped mass 'm' on roof and first floor level? **[6]**

Q5) a) A three storey office building on hard strata located in Delhi consists of Special Steel Moment Resisting Frame (SSMRF) without Infill wall as lateral load resisting system. Inter storey height is 3.50m. Seismic weights are 5000kN and 4000kN on floor and roof levels respectively. Workout: **[8]**

i) Fundamental time period, T_a

ii) Base Shear, V_b

iii) Distribution of base shear as per Seismic Coefficient method

iv) Storey Shear

b) What do you mean by Response Spectra of particular ground motion? **[2]**

OR

Q6) a) Explain various irregularities in building structures and their impact on seismic behaviour of structural system. **[5]**

b) Explain significance of ductile detailing in earthquake resistance design of structures. **[5]**