

Total No. of Questions : 12]

SEAT No. :

P3866

[5561]-512

[Total No. of Pages : 3

B.E. (Civil)

EARTHQUAKE ENGINEERING

(2015 Pattern) (Semester-I) (Elective-II)

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8 Q.9 or Q.10, Q.11 or Q.12.*
- 2) *Use of IS 456, IS 1893 and non programmable calculator is allowed.*
- 3) *Neat diagrams must be drawn wherever necessary.*
- 4) *If necessary assume suitable data and clearly mention the same.*

Q1) a) What do you mean by Convection Current? [4]

b) Describe in brief interior structure of earth. [6]

OR

Q2) a) Explain the Plate Tectonic Theory. [4]

b) What do you understand by magnitude and size of earthquake? Classify the earthquake based on magnitude. [6]

Q3) Classify vibration according to Direction and Characteristic point of view. [6]

OR

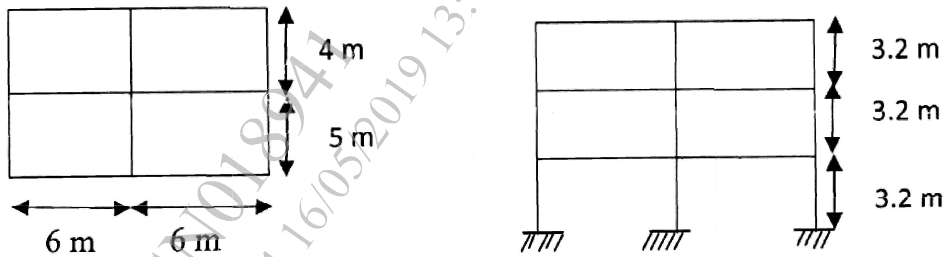
Q4) A weightless steel cantilever beam 0.6 m long has cross section of 40 mm deep and 15 mm wide. It supports a load of 750 N at the tip. Determine the natural frequency of vibration, natural period and derive formula used. [6]

Q5) Summarized philosophy of Seismic Design. [6]

OR

P.T.O.

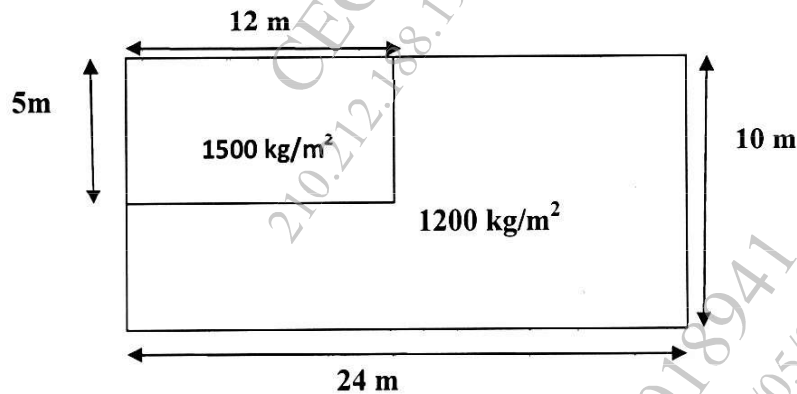
- Q6)** The plan and elevation of three story RC building located in Pune is shown in fig. The building consist of OMRF and rests on hard soil. Seismic weight on roof 865 kN and each floor 1190 kN. Calculate base shear. [6]



- Q7)** Explain in details the effect of irregularities of the building on the performance in an earthquake. [16]

OR

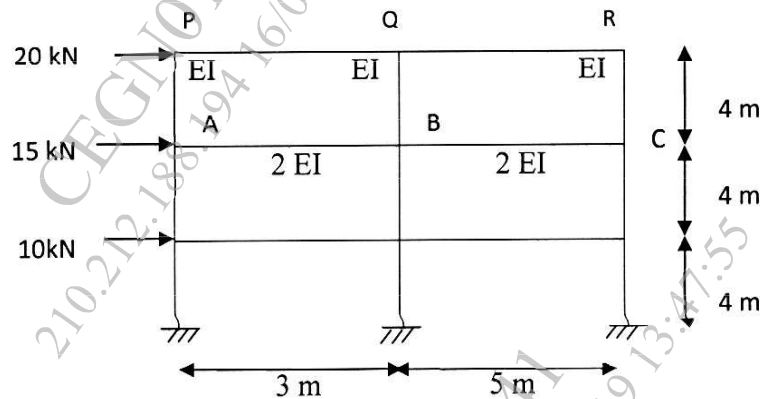
- Q8)** a) Write short note on 'Response Spectra' and 'effect of shear wall'. [8]
 b) A building having non-uniform distribution of mass is shown in figure. Locate its center of mass. [8]



- Q9)** a) Explain with neat sketches the ductile detailing of beam column joint. [8]
 b) Explain the procedure for estimation of combined effect of lateral forces and vertical loading on multistory frame. [8]

OR

Q10) Analyze the multistoried building frame as shown in figure by portal method for lateral loads. The dead load and total design load acting on beam AB are 13 kN/m and 28 kN/m respectively and 19 kN/m and 42 kN/m over beam BC. The relative stiffness of beam is double than the column stiffness. Analyse the beam ABC for vertical load by substitute frame method. Calculate maximum span moment at BC. Design beam section (BC) for combined effect of vertical load and horizontal loads 10% redistribution of moment is permitted for vertical load moments. Use M20 and Fe 415. **[16]**



Q11)a) Explain Active and Passive control. Write different types of the passive control system and explain any one. **[8]**

b) What are disaster management and explain qualities of rescuer. **[8]**

OR

Q12)a) Explain strengthening of slab and wall for RCC building. **[8]**

b) Explain any three retrofitting technique used for masonry building? **[8]**

