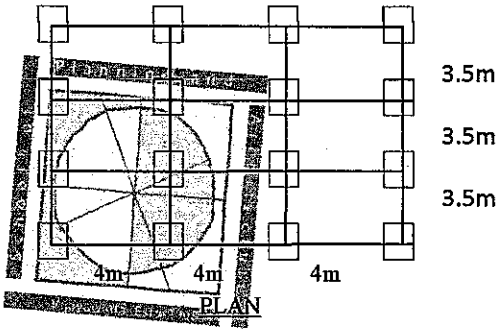
SCHOOL OF PLANNING AND ARCHITECTURE, VIJAYAWADA
B. ARCH III YEAR - VI SEMESTER EXAMINATION, (REGULAR), MAY 2015

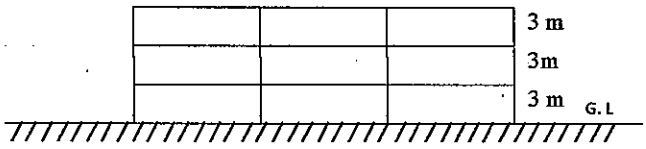
THEORY OF STRUCTURES (TS-6)

Maximum Marks – 100 **Time – 3.00 Hours**

a) Answer any Five Questions
b) Question No.8 is Compulsory.
c) IS 1893, IS 875 Part III Code Books are allowed into Exam Hall
d) Any missing data can be assumed and stated

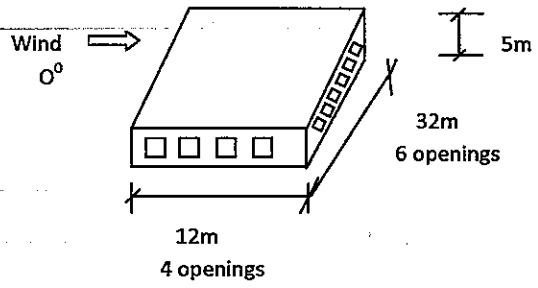
Q1. Consider a four storey reinforced concrete building located in Vijayawada (seismic zone III). The soil conditions are medium stiff and the entire building is supported on raft foundation. The R.C. frames are in filled with brick masonry. The lumped weight due to dead load is 15 kN/m^2 on floors and 12 kN/m^2 on roof. The floors are to support a live load of 4kN/m^2 on floors and 1.5 kN/m^2 on roof. Determine design seismic load shear distributed at each storey. **(20)**



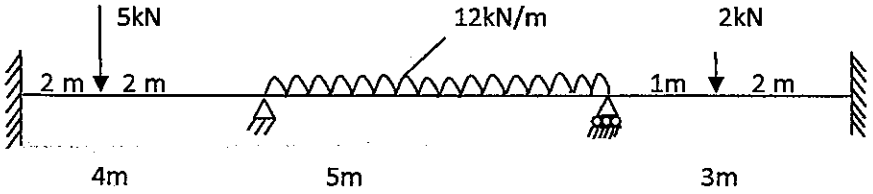


ELEVATION

Q2. Calculate design wind pressure and design wind force on wall and roof elements of a rectangular building having plan dimensions 12 m x 32 m and height of 5m as described in figure. The building is situated near New Delhi (V_b=45m/sec). It is supposed to serve the purpose of a shopping mall. The topography on which it is located is fairly level topography. The walls of building have openings as described in figure with size 1.5m x 1.5m. The building has flat roof making o° with direction of wind. **(20)**



Q3. Analyze the following continuous beam using moment distribution method and draw S.F.D.& B.M.D. diagram **(20)**



Q4. a) List out all the possible advantages of using a box girder over flat girder for bridge structure. **(10)**

b) List possible assumptions involved in moment distribution method of analysis in frames. **(10)**

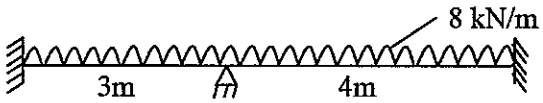
Q5. a) Explain few reasons that support selection of composite structure. **(10)**

b) Draw a neat sketch of composite beam and explain each lable of sketch and its functioning requirements. **(10)**

Q6. a) List out all advantages and disadvantages involved in practicing finite element method. **(10)**

b) Illustrate the advantages of arch and truss system of structure over flat roofing. **(10)**

Q7. Design the following continuous beam against bending and shear, imposed to a live load of 8kN/m also draw neat sketch explaining full reinforcement detailing of member. **(20)**



Q8. Write short notes of ***any four*** of the following **4 x 5=20**

a) Explain Plate Tectonic theory of Earthquakes in brief.

b) Explain seismic wave propagation at a site

c) Sketch the diagram of early seismograph instrument.

d) Explain Focus, Focal depth and Epicenter in occurrence of seismic activity

e) State and describe the equation given by IS 875-Part III for design wind pressure in kN/m^2.

f) State and describe the equation given by IS 1893 for base shear magnitude in kN.