B.Tech. Degree VI Semester Examination, April 2009

CE 602 (A/B) ANALYSIS OF STRUCTURES II
(2006 Scheme)

Time: 3 Hours   Maximum Marks: 100

PART – A

(8 x 5 = 40)

I   a)   Using Column Analogy method, find the end moments developed in a fixed beam subjected to a uniformly distributed load 'W' through the Span 'l'.

b)   Explain the theory of Column Analogy.

c)   Explain the portal method for analyzing a building frame subjected to horizontal forces.

d)   Explain the cantilever method of analysis.

e)   State and explain Muller – Breslau principle.

f)   Draw the influence lines for

    i)   Reaction R_A
    ii)   Sheer at D
    iii)   Bending moment at D
    iv)   Sheer to the right of B
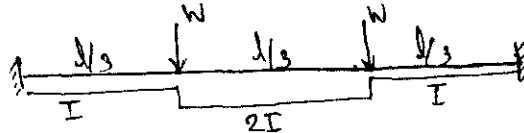   v)   Bending moment at B for the overhanging beam shown in following Figure.
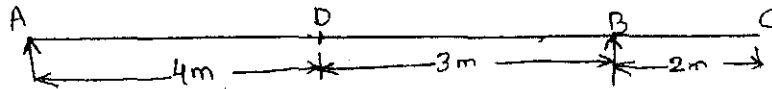
g)   Discuss the components and their functions of a suspension bridge.

h)   A two-hinged parabolic arch of span l and rise h carries a concentrated load W at the crown.

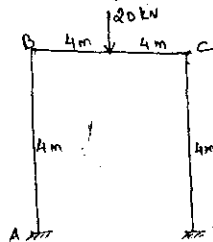Show that the horizontal thrust equals $\dfrac{25}{128}\dfrac{Wl}{h}$ at each support.

PART – B

(4 x 15 = 60)
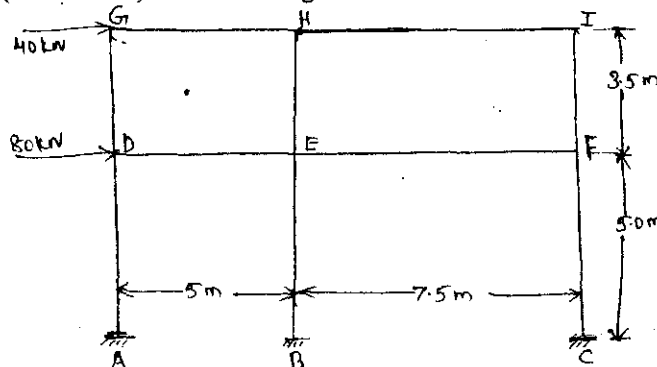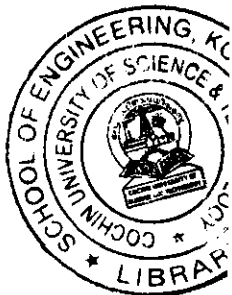
II   Analyse the fixed beam shown in Fig.

OR

III   Analyse the portal frame shown in figure.   Assume uniform section for all members.

IV   Using the portal method, analyse the building frame subjected to horizontal forces (due to wind) as shown in figure.
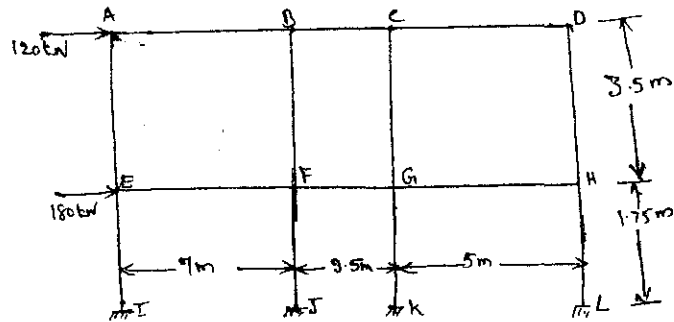

*(Turn Over)*

OR

V   Analyse the frame by cantilever method, assuming that all the columns have the same area of cross section.


VI   Four wheel loads of 6, 4, 8 and 5 kN cross a girder of 20m span, from left to right followed by U.D.L. of 4 kN/n and 4m long with the 6 kN load leading. The spacing between the loads in the same order are 3m, 2m and 2m. The head of the U.D.L. is at 2m from the last 5 kN load. Using influence lines, calculate the S.F. and B.M. at a section 8m from the left support when the 4 kN load is at center of the span.
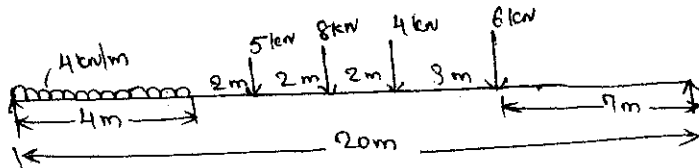
OR

VII   Draw the influence line diagrams for the forces in the Bottom Chord, Vertical and diagonal members of the through type bridge truss.
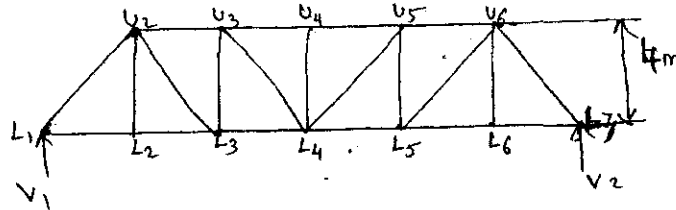
Panels at 4m each 24 m.

VIII   A Semi-circular arch of radius 'R' is subjected to a uniformly distributed load of w/unit length over the entire span. Assume EI to be constant. Determine the horizontal thrust.

OR

IX   A suspension cable of span 100m and dip 10m carries a uniformly distributed load of 8 kN/m of horizontal span over the full span. Find the vertical and horizontal forces transmitted to the supporting pylons.

         i)   If the cable is passed over a smooth pulley.

         ii)   If the cable is clamped to a saddle with rollers on the top of the piers. The anchor cable makes 30^0 to the horizontal at the pylons.

★★★★