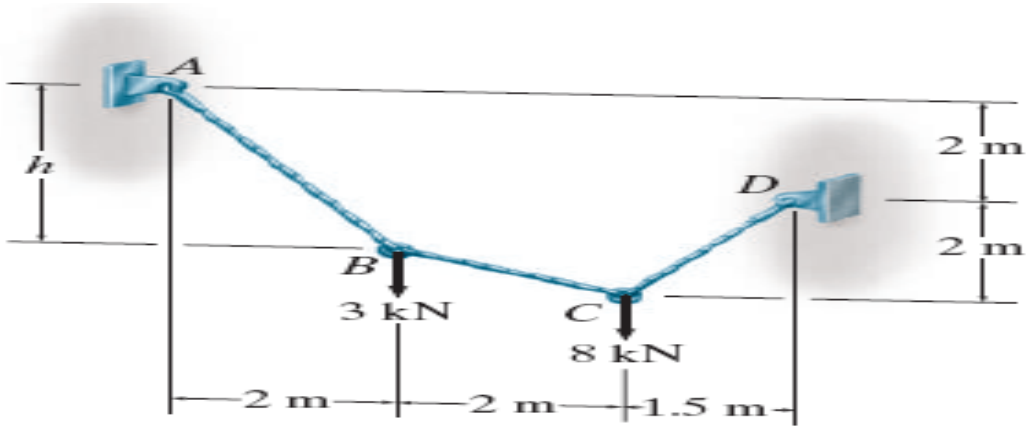
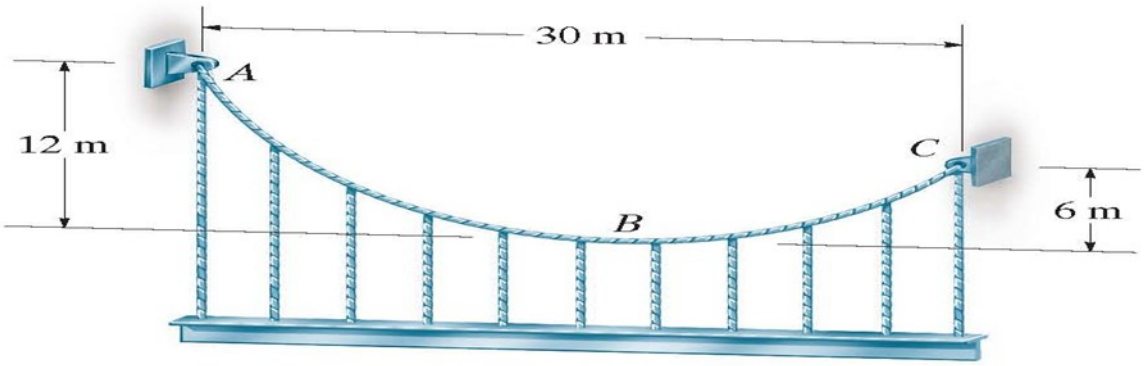
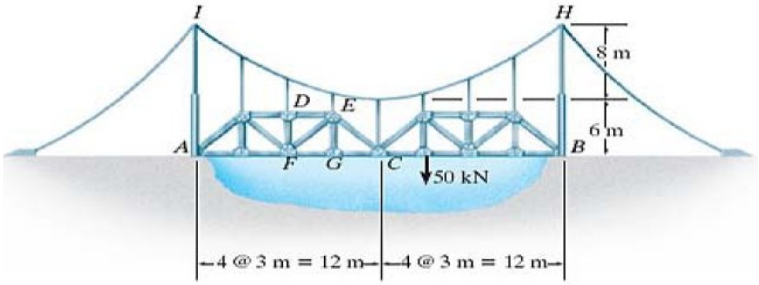
1) What are cable structures? Mention its needs.
2) What is the true shape of cable structures?
3) What is the nature of force in the cables?
4) What is a catenary?
5) Mention the different types of cable structures.
6) Briefly explain cable over a guide pulley.
7) Briefly explain cable over saddle.
8) Give the expression for calculating equivalent UDL on a girder.
9) Give the range of central dip of a cable.
10) Give the expression for determining the tension in the cable.
11) Give the types of significant cable structures
12) Give examples of three hinged stiffened girder.
13) What is the degree of indeterminacy of a suspension bridge with two hinged stiffening girder.
14) Determine the tension in each segment of the cable. Also, what is the dimension h?



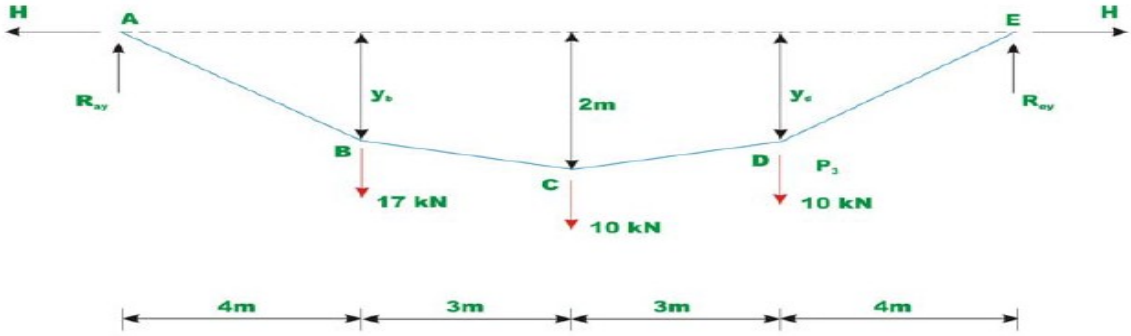
15) The cable supports a girder which weighs 12kN/m. Determine the tension in the cable at points A, B & C.



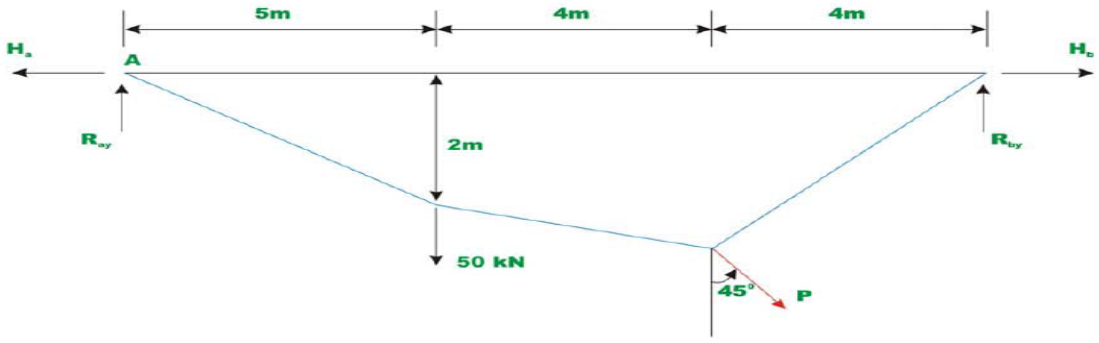
16) Determine the max tension in the cable IH



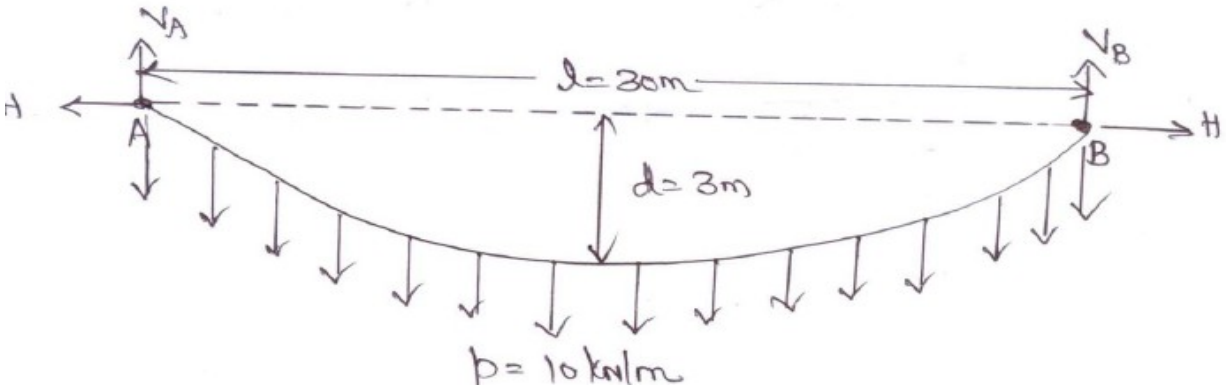
17) Determine reaction components at A and B, tension in the cable and the sag y_B and y_E of the cable shown in Figure. Neglect the self-weight of the cable in the analysis.



18) A cable of uniform cross section is used to span a distance of 40m as shown in Fig 31.5. The cable is subjected to uniformly distributed load of 10 kN/m. run. The left support is below the right support by 2 m and the lowest point on the cable C is located below left support by 1 m. Evaluate the reactions and the maximum and minimum values of tension in the cable.



19) A suspension cable having supports at the same level has a span of 30m and a maximum dip of 3m.The cable is loaded with a udl of 10kN/m throughout its length. Find the maximum tension in the cable.



20) A suspension bridge of 250m span has two no's of three hinged stiffening girdness supported by cables with a central dip of 25m.If 4 point load of 300kN each are placed at the centre line of the roadway at 20, 30,40 and 50m from the left hand hinge, find the shear force and bending moment in each girder at 62.5m from each end. Calculate also the maximum tension in the cable.

21) A suspension cable is supported at 2 points 25m apart .The left support is 2.5m above the right support. The cable is loaded with a uniformly distributed load of 10kN/m throughout the span. The maximum dip in the cable from the left support is 4m.Find the maximum and minimum tensions in the cable.

22) A suspension cable of 75m horizontal span and central dip 6m has a stiffening girder hinged at both ends. The dead load transmitted to the cable including its own weight is 1500kN.The girder carries a live load of 30kN/m uniformly distributed over the left half of the span. Assuming the girder to be rigid, calculate the shear force and bending moment in the girder at 20m from the left support .Also calculate the maximum tension in the cable.

23) A suspension cable has a span of 120m and a central dip of10m is suspended from the same level at both towers. The bridge is stiffened by a stiffening girder hinged at the end supports. The girder carries a single concentrated load of 100kN at a point 30m from left end. Assuming equal tension in the suspension hangers. Calculate

i) the horizontal tension in the cable

ii) the maximum positive bending moment

24) The three hinged stiffening girder of a suspension bridge of 110 m is subjected to two point loads of 15 kN each placed at 22 m and 44 m respectively from the left hand hinge. Determine the B.M. and S.F. in the girder at section 33 m from each end. Also determine the maximum tension in the cable which has a central dip of 11 m.

25) Two point loads of 60 kN and 80 kN spaced 2.5 m apart cross a girder of span 15 m from left to right with the 60 kN load leading. Determine the maximum values of shear force and bending moment that can occur at any point of the girder using influence lines. Also plot the maximum positive and negative shear force and bending moment diagrams stating their absolute maximum values.

26) A single rolling load of 100 KN moves on a girder of span 20m. (a) Construct the Influence lines for (i) Shear force and (ii) Bending moment for a section 5m from the left support, (b) Construct the influence lines for points at which the maximum shears and maximum bending moment develop. Determine these maximum values.

27) The cables of a suspension bridge have a span of 40 m and a dip of 5 m. Each Cable is stiffened by a girder hinged at the ends and at mid span to enable to cable to maintain its parabolic shape. A UDL of 10 kN/m over the whole span and a live load of 30 kN/m over 10 m length in central part. Determine the maximum cable tension when the head of the live load is on the central hinge: Calculate maximum S.F. and B.M. at a section 10m from the left end.

(b) Draw the schematic influence line diagrams for maximum moment, and shear force for a two-hinged stiffening girder.