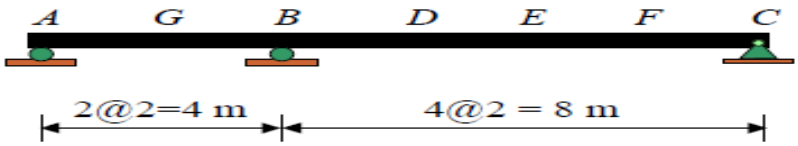
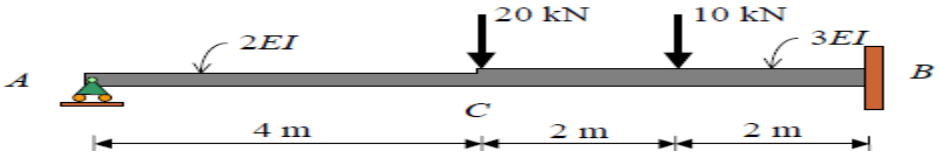
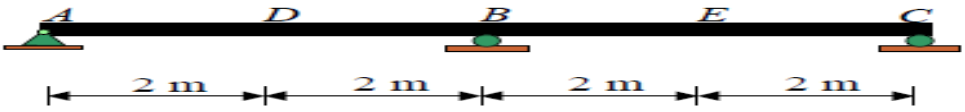
1) Define: Influence lines
2) State the uses of influence line diagrams
3) Sketch the influence line diagram for shear force at any section of a simply supported beam
4) State: Muller-Breslau's Principle
5) What is the degree of static indeterminacy of a three hinged parabolic arch?
6) A symmetrical two hinged arch (circular) supports a load W at the crown.What is the value of H?
7) Draw influence line for end reaction at A,B,C and shear force at G and E



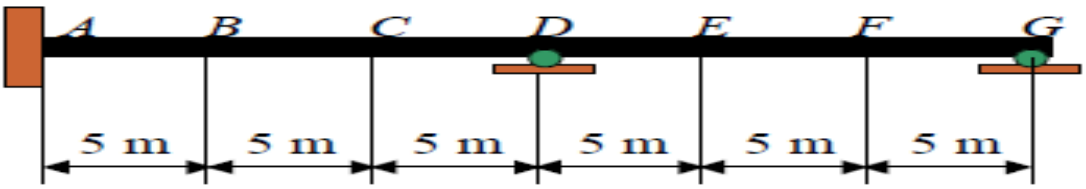

8) Draw influence line for end reaction at A,B and shear force at C and .bending moment at B.



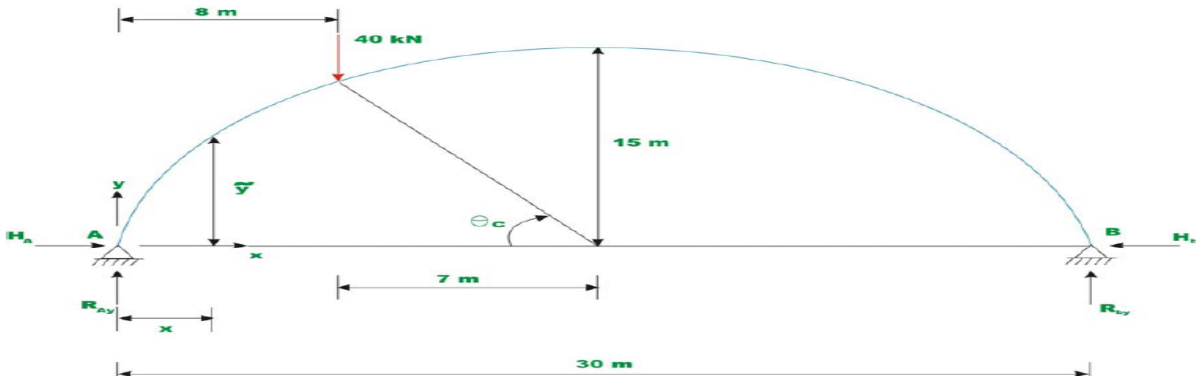

9) Draw influence line for end reaction at A,B,C and shear force at D and E.



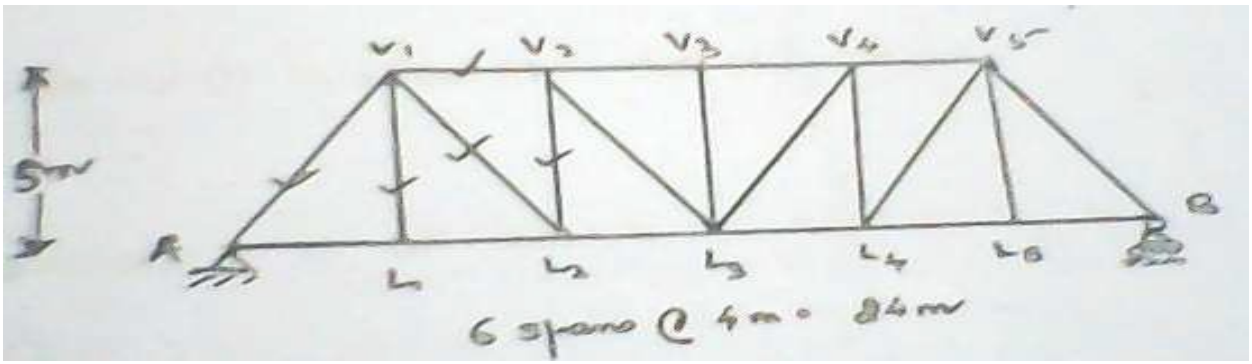
**10**) Draw influence line for end reaction at A,D,G and shear force at B,C,E,and E and bending moment at A.



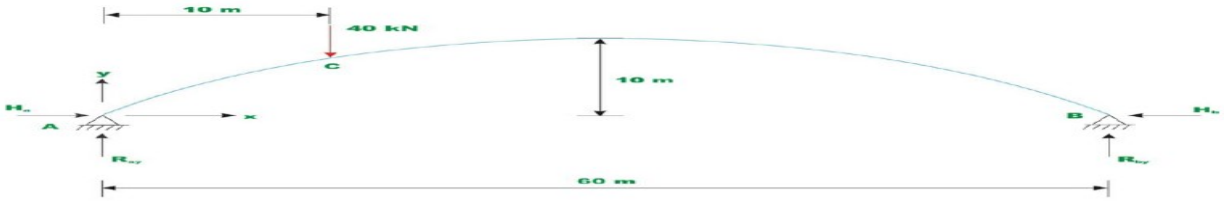

**11)** A semicircular two hinged arch of constant cross section is subjected to a concentrated load. Calculate reactions of the arch and draw bending moment diagram.



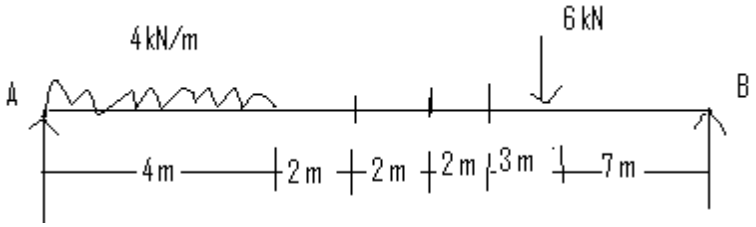

**12)** Draw influence line for diagonal element.



**13)** A two hinged parabolic arch of constant cross section has a span of 60m and a rise of 10m. It is subjected to loading as shown in Calculate reactions of the arch if the temperature of the arch is raised by. Assume co-efficient of thermal expansion as C°40.



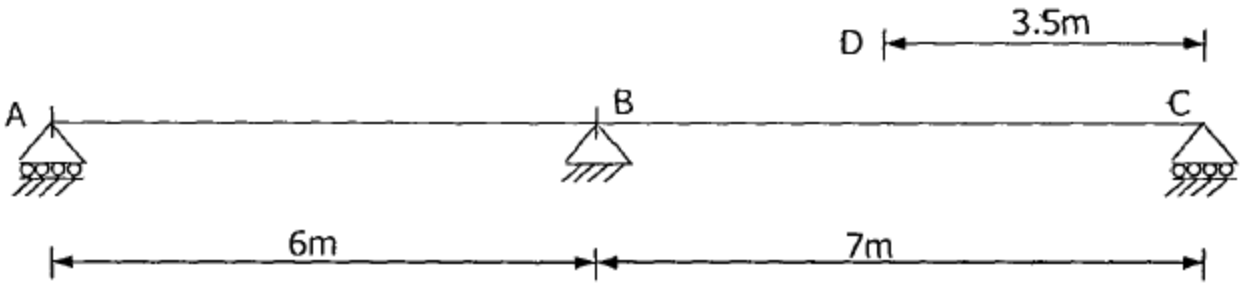

**14)** Draw influence line for end reaction and shear force at 6 KN load application point




**15)** 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 shearforce 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

**16)** 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.

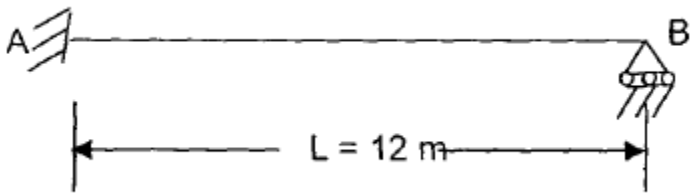
**17)** Using Muller Breslau's Principle Determine the influence line for the shear force at D, the middle point of span BC, of a continuous beam ABC shown in Fig. 13.a.Compute the ordinates at-every quarter point of each span.




**18)** A two hinged parabolic arch of span 25 m and central rise 4m carries a uniformly distributed load of 15 kN/m over the left half of the span. Determine the position and value of maximum bending moment. Also find the normal thrust and radial shear force at the section. Assume that the moment of inertia at a section varies as secant of the inclination at the section.

**19)** Two hinged semi-circular arch of uniform section is hinged at the abutments which are at the same level. It carries a point load W at the crown. Find the horizontal thrust
at the abutments.

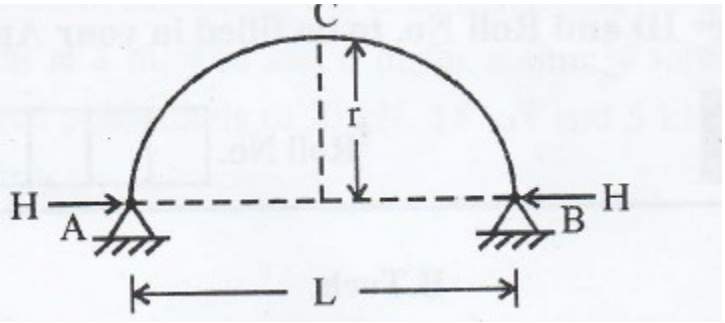
**20)** Using Muller Breslau Principle, compute the influence line ordinates for {i) Reaction at B and (ii) Moment at A for the propped cantilever shown in Figure for a point 6.25 m from A.




**21)** What is a two hinged arch? Find out the horizontal thrust. A two hinged parabolic arch of span 20 m and rise 4m carries a uniformly distributed load of 5 t/m on the left half of span as shown in figure. The moment of inertia I of the arch section at any section at any point is given by I : l0 sec 0 where 0 : inclination of the tangent at the point with the horizontal and Io is the moment of inertia at the crown. Find

(i) the reactions at the supports
(ii) the position and value of the maximum bending moment in the arch.

**22)** Draw the schematic influence time diagrams for maximum bending moment' shear force and horizontal thrust for a two-hinged parabolic arch .




**23)** Derive the influence diagram for reactions and bending moment at any section of a simply supported beam. Using the ILD, determine the support reactions and find bending moment at 2 m,4 m and 6 m for a simply supported beam of span 8 m sub.lected to tlree point loads of 10 kN, 15 kN and 5 kN placed at trm,4.5 m and 6.5 m respectively.