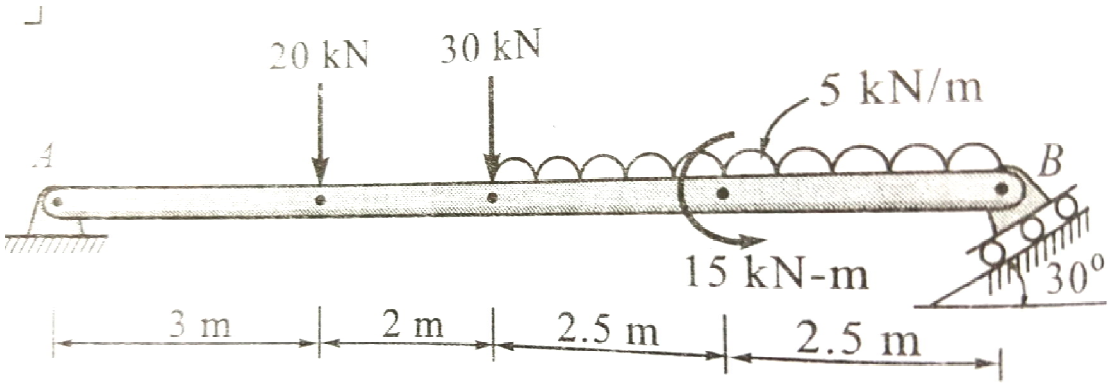
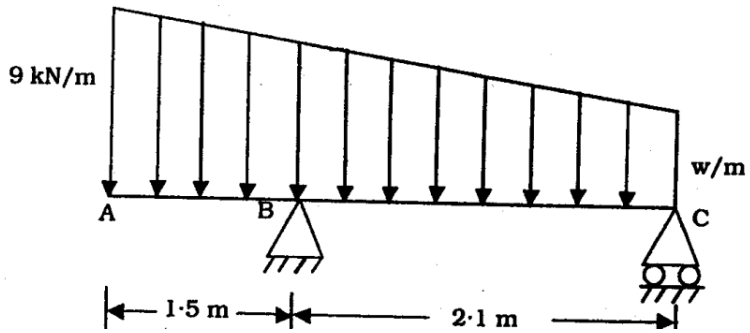
Civil Engineering Department
Engineering Mechanics Tutorial: Beams

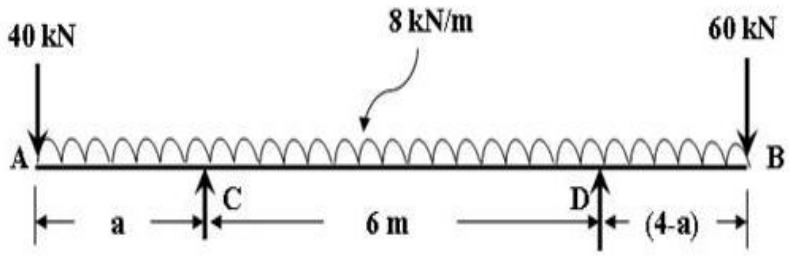
1 Determine the reactions at all the supports of the beam as shown in Figure
[Ans: R_B = 44.17 kN , V_A = 36.75 kN (↑), H_A = 22.1 kN (→)]



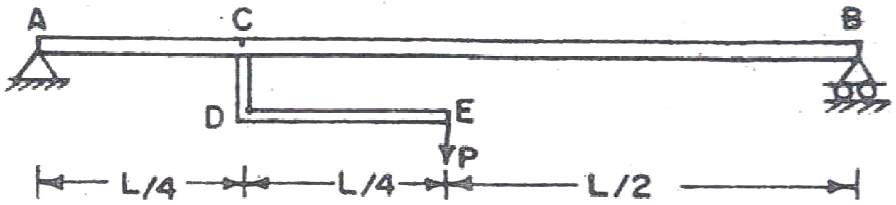
2 Determine the intensity of the distributed load 'w' at the end 'C' of the beam ABC (shown in figure) for which reaction at 'C" is zero, also find out reaction at B.
[Ans: w = 3 kN/m, R_B = 21.6 kN]



3 A horizontal beam 10 m long carries a uniformly distributed load of 8 kN/m together with concentrated loads of 40 kN at the left end and 60 kN at the right end. The beam is supported at two points 6 m away, so chosen that reaction is the same at the each support. Determine the position of support 'C' from left end.
[Ans : a =2.55 m]

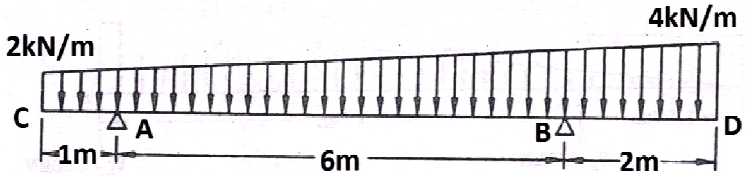


4 A simple supported beam ACB supports a vertical load P by means of a bracket CDE, as shown in **Figure**. Find the reaction at A & B.
[Ans: $R_A = R_B = P/2$]

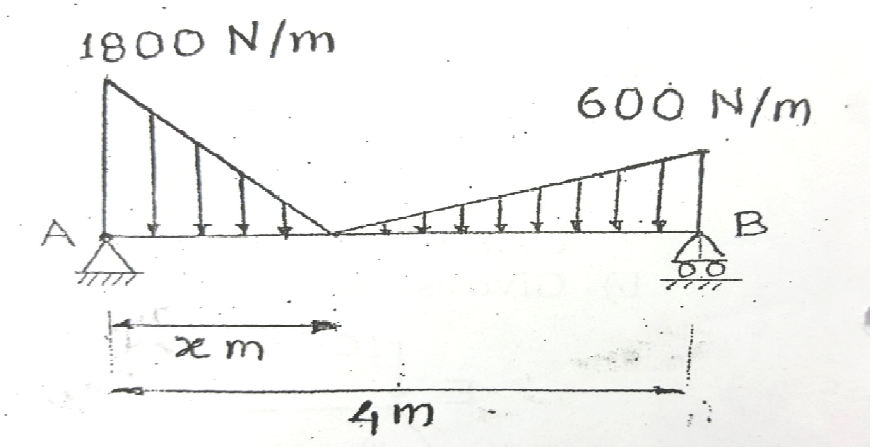


5 A beam ABC is loaded as shown in **Figure**. Determine the location at which a concentrated load of 2.5 kN must act from A to make the reactions at A and B equal.
[Ans: a = 0.667 m]

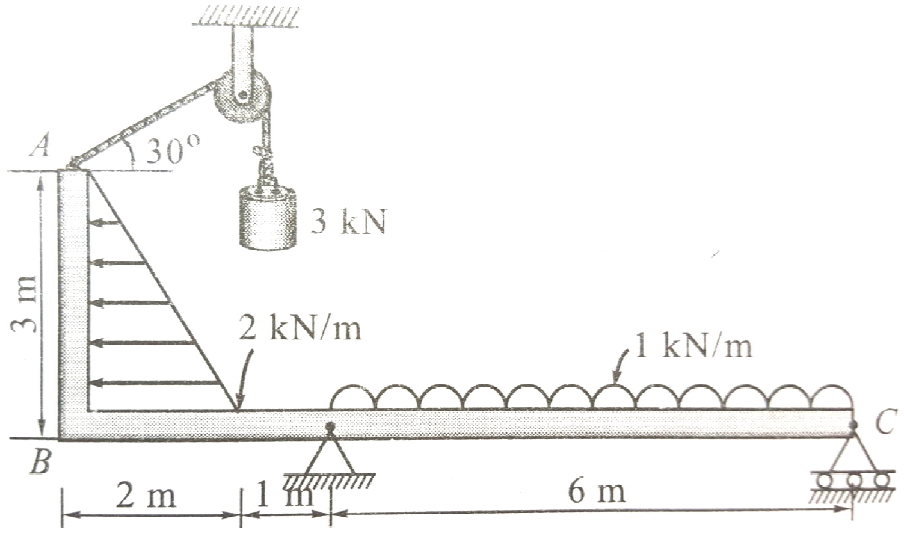
6 Determine the reactions of beam supported at A and B shown in Figure
[Ans: R_A =9 kN , R_B =18 kN]



7 Determine the distance 'x' so that the reaction at support B is minimum. Also find the corresponding reaction at the Supports
[Ans: x= 1 m, R_A = 1050 N, R_B = 750 N]



8 A single rigid bar ABC of L shape is loaded and supported as shown. Find the support reactions [Ans: R_C = 4.55 kN (↑), H_D =0.4 kN (→), V_D =0.05 kN (↓)]



9 Determine the reactions at all the supports of the beam as shown in Figure [, A_X =8.66 kN, A_Y = 8.79 kN, B_Y = 9.21 kN]