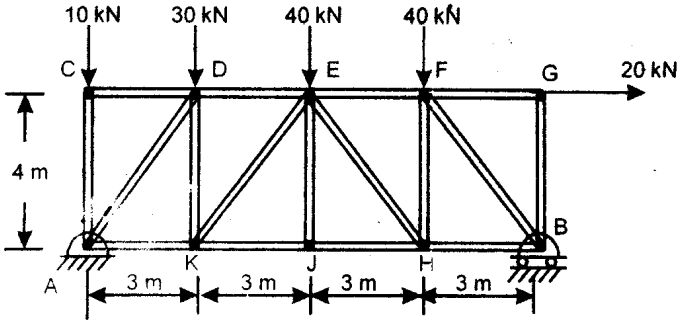
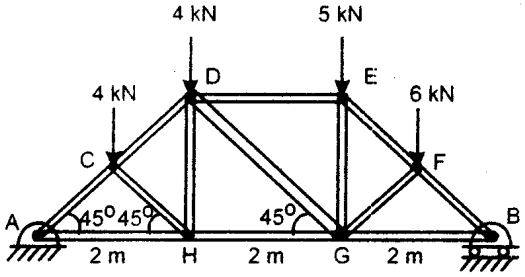
P1. A truss is loaded as shown:

a. Find reactions at supports
b. By method of joints solve joints A, C, D and K
c. By method of sections find JH, FB and FH
d. Without calculations find zero force members



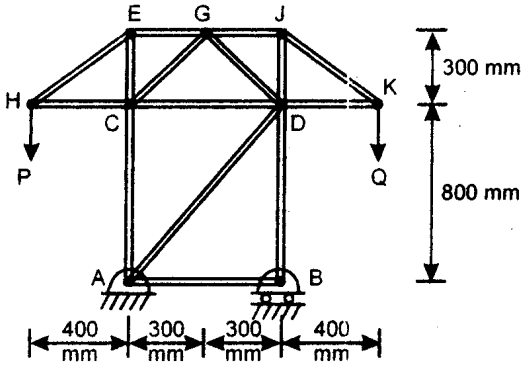
P2. For the truss shown determine;

a. Reactions.
b. Forces in DE, DG and GH by method of sections.
c. Magnitude and nature of forces in all members by method of joints.



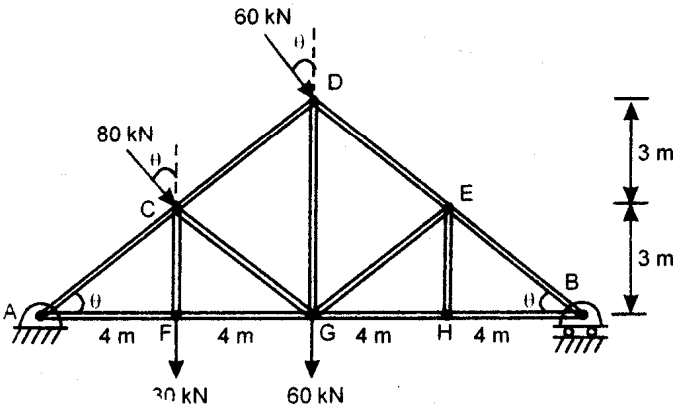
P3. A pin jointed tower truss is shown.

a. Take load P = load Q = 4 kN to find the axial forces in all the members. Tabulate your results.
b. If P = 4 kN and Q = 8 kN find by method of sections the forces in members EG, GJ and AB.



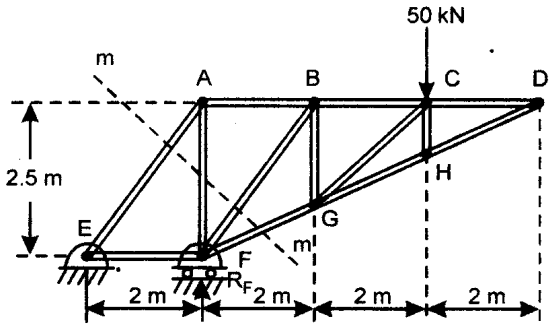
P4. For the truss shown.

a. Identify the members carrying zero force.
b. Find forces at joints A, C, D and G by method of joints.
c. Find support reactions.
d. Find forces in CD, CG, FG, and CF using method of section.



P5. For the truss shown

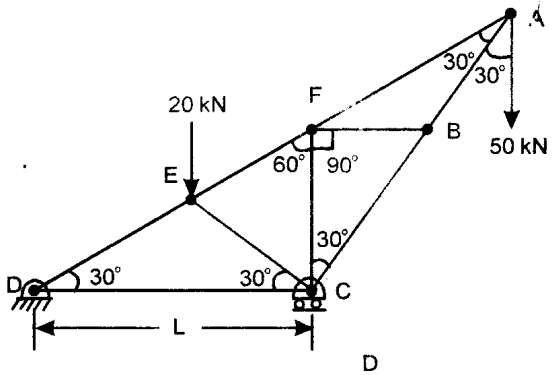
a. Identify the zero force member in the truss shown in the figure.
b. Find the forces in the remaining members of the truss by using method of joints.
c. Find the forces in the members AE by method of section taking a section, mm.
d. Using the values of the force found in the members meeting at support F, find the reaction at F.



P6. Referring the truss shown in the figure find:

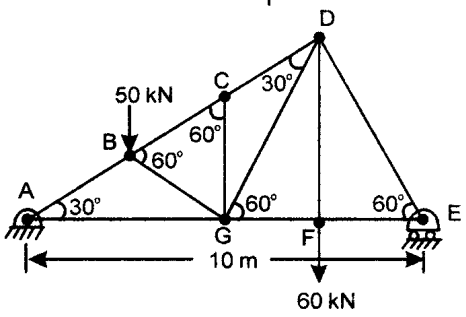
a. Reactions
b. Zero force members
c. Forces in other members by method of joints
d. Forces in members FE and DE by method of sections.

Tabulate the results of the analysis.



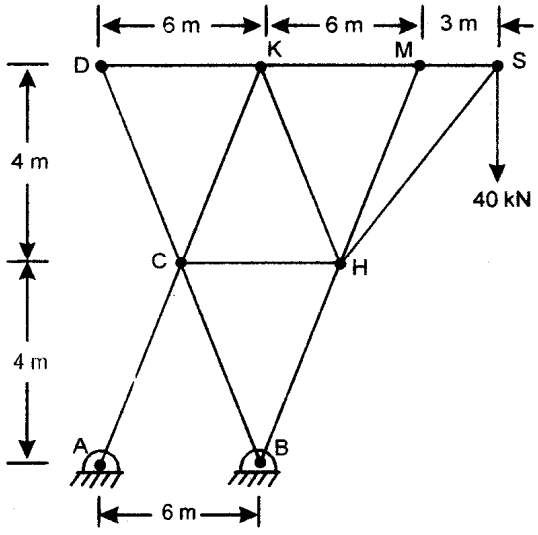
P7. For the truss shown find

a. The reactions at A and E
b. Forces in the members meeting at joint F by method of section
c. Forces in remaining members by method of joints.
d. Show the results of analysis in a tabular form.



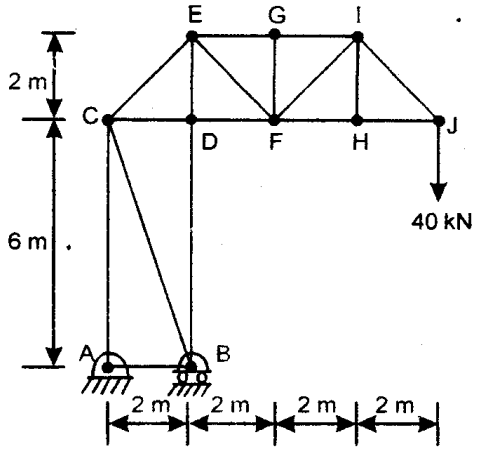
P8. A pin-joined plane truss is supported and loaded by only one load of 40 kN as shown.

a. Find members carrying zero forces by the method of inspection giving reasons.
b. Find the force in the members KC and BH by method of section.
c. Find the reactions at the supports in magnitude and direction.

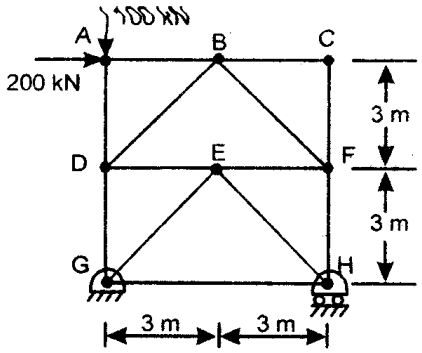


P9. For the pin-joined truss loaded as shown, find

a. All the reactions at A and B
b. Forces in members EC, ED and DF by method of sections.
c. Identify all the zero force members giving reasoning for each member.
d. Axial forces in remaining members by method of joints.

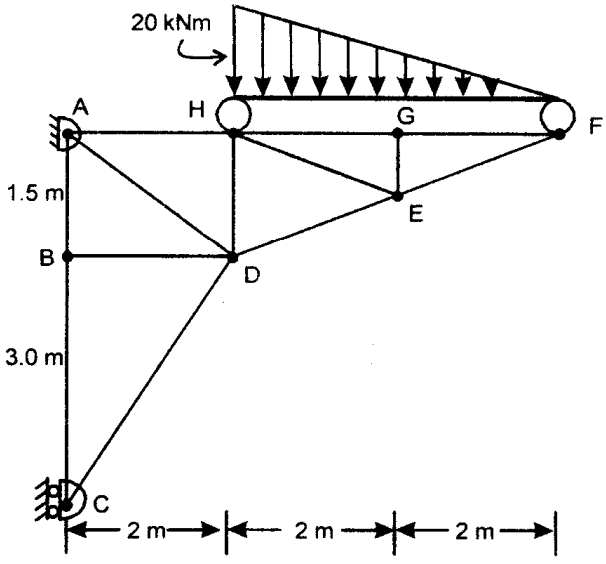


P10. Find forces in members DG and FH by method of sections.

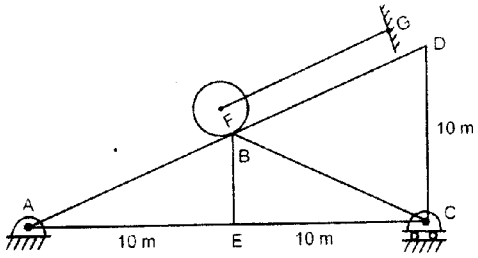


P11. For the truss shown find,

a. Support reaction
b. Solve joints F and G by method of joints.
c. Find AH and AD by method of sections.



P12. A sphere of weight 1000 N rests on joint B. It is kept from rolling down the plane by a cable FG. Cable FG is parallel to portion ABD of the truss. Find support reactions and forces in all members of the truss.



ANSWERS

P1. $R_B = 64.16$ kN ↑; $V_A = 55.8$ kN ↑;
$H_A = 20$ kN ←; $F_{CA} = 10$ kN (C);
$F_{CD} = 0$; $F_{AD} = 57.2$ kN (C);
$F_{AK} = 54.3$ kN (T); $F_{DK} = 15.8$ kN (T);
$F_{EK} = 19.8$ kN(C); $F_{KJ} = 66.2$ kN (T);
$F_{HJ} = 66.2$ kN (T); $F_{EJ} = F_{GB} = 0$;
$F_{BF} = 80.2$ kN (C); $F_{BH} = 48.12$ kN(T);
$F_{EF} = 28.1$kN (C); $F_{FH} = 24.16$ kN (T);
$F_{DE} = 34.36$ kN (C)

P2. $R_B = 10.33$ kN; $V_A = 8.67$; $H_A = 0$;
$F_{CD} = 9.42$ kN(C), $F_{DE} = 7.34$ kN (C);
$F_{AC} = 12.56$ kN(C);
$F_{AH} = 8.67$ kN(T); $F_{CH} = 2.83$ kN (C);
$F_{DG} = 0.947$ kN (T); $F_{DH} = 2$ kN (T);
$F_{HG} = 6.66$ kN(T); $F_{EG} = 2.32$ kN (T);
$F_{EF} = 10.35$ kN(C); $F_{GF} = 4.24$ kN(C)
$F_{FB} = 14.6$ kN(C); $F_{GB} = 10.33$ kN(T)

P3.a) $F_{JK} = F_{HE} = 6.66$ kN (T);
$F_{EG} = F_{GJ} = 5.33$ kN (T);
$F_{EC} = F_{JD} = F_{AC} = F_{BD} = 4$ kN (C);
$F_{AD} = F_{AB} = F_{CG} = F_{GD} = 0$;
$F_{CD} = F_{DK} = F_{HC} = 5.33$ kN (C)
b) $F_{EG} = 5.33$ kN (T);
$F_{GJ} = 10.66$ kN (T); $F_{AB} = 0$;
$V_A = 1.33$ kN ↑; $R_B = 10.66$ kN ↑

P4. $R_B = 100$ kN ↑; $V_A = 102$ kN ↑;
$H_A = 84$ kN ← ; $F_{AC} = 170$ kN (C);
$F_{AF} = F_{FG} = 220$ kN (T);
$F_{GH} = F_{BH} = 133.3$ kN (T);
$F_{EB} = F_{DE} = 166.6$ kN (C);
$F_{EG} = 0$; $F_{EH} = 0$; $F_{CF} = 30$ kN (T);
$F_{CG} = 108.2$ kN (C);
$F_{DG} = 125$ kN(T); $F_{CD} = 121.6$ kN(C)

P5. $R_F = 150$ kN ↑; $V_E = 100$ kN ↓ ;
$H_E = 0$; $F_{AE} = 128$ kN (T);
$F_{EF} = 80$ kN (C); $F_{AB} = 80$ kN (T);
$F_{AF} = 100$ kN(C); $F_{BF} = 32.12$ kN(C);
$F_{FG} = 64.95$ kN (C); $F_{BC} = 60$ kN (T);
$F_{BG} = 25$ kN (T); $F_{CG} = 78.1$kN (C);
$F_{CD} = F_{CH} = F_{GH} = F_{HD} = 0$

P6. $R_C = 85$ kN ↑, $V_D = 15$ kN ↓, $H_D = 0$,
$F_{BF} = F_{CF} = 0$; $F_{AF} = F_{EF} = 50$ kN (T);
$F_{AB} = F_{BC} = 86.6$ kN (C);
$F_{EC} = 20$ kN (C);
$F_{CD} = 26$ kN (C); $F_{ED} = 30$ kN (T);

P7. $H_A = 0$; $V_A = 52.5$ kN ↑; $R_E = 57.5$ kN ↑; $F_{AB} = 105$ kN (C); $F_{AG} = 90.9$ kN (T);
$F_{BC} = F_{CD} = 55$ kN (C); $F_{BG} = 50$ kN (C); $F_{CG} = 0$; $F_{DG} = 28.86$ kN (T);
$F_{GF} = F_{EF} = 33.2$ kN (T); $F_{FD} = 60$ kN (T); $F_{ED} = 66.39$ kN (C)

P8. $H_A = 45$ kN ←; $V_A = 60$ kN ↓; $H_B = 45$ kN →; $V_B = 100$ kN (T)↑; $F_{KC} = 50$ kN (T);
$F_{BH} = 100$ kN (C); $F_{MH} = F_{KD} = F_{CD} = 0$

P9. $H_A = 0$; $V_A = 120$ kN ↓; $R_B = 160$ kN ↑; $F_{EC} = 169.7$ kN (T); $F_{ED} = F_{BD} = 160$ kN (C);
$F_{CD} = F_{DF} = 120$ kN (C); $F_{CA} = 120$ kN (T); $F_{FH} = F_{JH} = 40$ kN (C);
$F_{JI} = F_{FI} = 56.7$ kN (T); $F_{EG} = F_{GI} = 80$ kN (T); $F_{AB} = F_{BC} = F_{GF} = F_{HI} = 0$;
$F_{IF} = 56.7$ kN (C)

P10. $F_{DG} = 0$, $F_{FH} = 100$ kN (C)

P11.a) $H_A = 29.61$ kN ←, $V_A = 40$ kN ↑, $R_C = 29.61$ kN →;
b) $F_{EF} = 37.96$ kN (C); $F_{GF} = F_{HG} = 35.55$ kN (T); $F_{EG} = 0$;
c) $F_{AH} = 35.47$ kN (T); $F_{AD} = 7.33$ kN (C)

P12. $H_A = 400$ N ←; $V_A = 300$ N ↑; $R_C = 500$ N ↑; BD = DC = EF = 0 ;
AE = EC = 1000 N (T); BC = 1118 N (C); AB = 670.8 N (C)