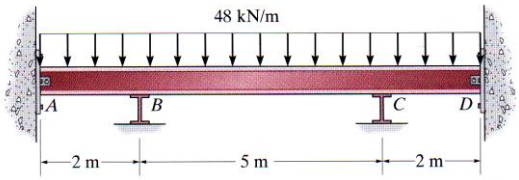
CE 383 STRUCTURAL ANALYSIS
2012 Spring Semester

Problem Set # 4

Solve all questions by using the "Moment Distribution Method".

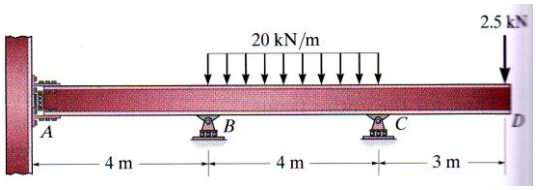
Q.1. (Hibbeler, 6th edition, P12-2)

Determine the moments at B and C. EI is constant. Assume B and C are rollers and A and D are pinned.



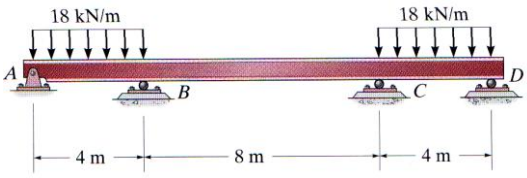
Q.2. (Hibbeler, 6th edition, P12-5)

Determine the reactions at the supports and then draw the moment diagram. Assume A is fixed. EI is constant.



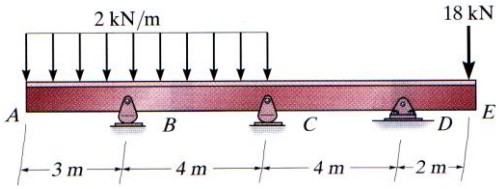
Q.3. (Hibbeler, 6th edition, P12-7)

The beam is subjected to the loading shown. Determine the reactions at the supports, and then draw the moment diagram. EI is constant.



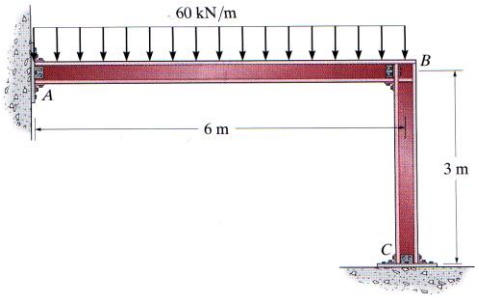
Q.3. (Hibbeler, 6th edition, P12-9)

Determine the moments at A, B and C, then draw the moment diagram. EI is constant.



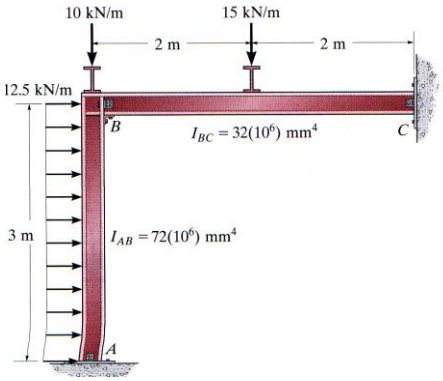
Q.4. (Hibbeler, 6th edition, P12-10)

Draw the moment diagram for each member. EI is constant. All joints are fixed connected.



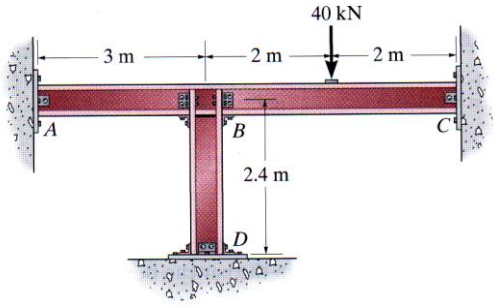
Q.5. (Hibbeler, 6th edition, P12-11)

Determine the horizontal and vertical components of reaction at the connections A and B. Assume A and C are pins and B is fixed joint. Take *E*= 200 GPa.



Q.6. (Hibbeler, 6th edition, P12-14)

Determine the reactions at the supports. Assume A and C are pinned and B and D are fixed connected. EI is the same for each member.



Answers of Problem Set 4

Q.1)

$M_{BA} = 84.0\ \text{kN·m}; \quad M_{CD} = 84\ \text{kN·m}$

Q.2)

$M_{AB} = 10.4\ \text{kN·m}; \quad M_{BC} = 20.7\ \text{kN·m};$
$M_{CB} = 7.5\ \text{kN·m}$

Q.3)

$A_x = 0; \quad A_y = 33.75\ \text{kN}; \quad B_y = 38.25\ \text{kN};$
$C_y = 38.25\ \text{kN}; \quad D_y = 33.75\ \text{kN}$

Q.4)

$M_{BA} = 9\ \text{kN·m}; \quad M_{CD} = 9.25\ \text{kN·m}$
$M_{DC} = 36\ \text{kN·m}$

Q.5)

$A_y = 117\ \text{kN}; \quad B_x = 36\ \text{kN}; \quad B_y = 99\ \text{kN};$
$C_x = 36\ \text{kN}$

Q.6)

$B_x = 22.7\ \text{kN}; \ B_y = 20.5\ \text{kN}; \ A_x = 14.8\ \text{kN};$
$A_y = 20.5\ \text{kN}; \quad C_x = 22.7\ \text{kN}; \quad C_y = 4.5\ \text{kN}$

Q.7)

$M_{BA} = 8.78\ \text{kN·m}; \quad M_{BL} = -23.4\ \text{kN·m};$
$M_{BD} = 14.6\ \text{kN·m}; \quad M_{DB} = 7.32\ \text{kN·m}$