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A.

```
sets I/A,B/;

parameters p(I)/A 25, B 30/

PR(I) /A 200, B 140/

MC(I) /A 6000, B 4000/;

scalar H/40/;

Positive Variable X(I);

Variable Z;

Equations OBJ , CONST, CAP(I);

OBJ.. Z=E=sum(I,p(I)*X(I));

CONST..sum(I,X(I)/PR(I))=L=H;

CAP(I)..X(I)=L=MC(I);

model PP/ALL/;

solve PP using LP max Z;

display X.L,Z.L;
```

B.

```
sets i/A,B,c/;

parameters p(i)/A 25,B 30,c 29/

        pr(i)/A 200,B 140, c 160/

        Mc(i)/ A   6000,B 4000 ,c 3500/;

scalar H /40/;

positive variables x(i);

variable z;


equations obj,const ,cap(i);

obj..z=E= sum (i,p(i)*x(i));

const..sum(i,x(i)/pr(i))=L=H;

cap(i)..x(i)=L=Mc(i);


MODEL problem_1 for/all/;

solve problem_1 using lp max z;

Display x.L,z.L;
```

C.

```
sets i/A,B,c/;

parameters p(i)/A 25,B 30,c 29/

        pr(i)/A 200,B 140, c 160/

        Mc(i)/ A   6000,B 4000 ,c 3500/

        pt(i)/ A 1000,B 500,c 750/;

scalar H /40/;

positive variables x(i);
```

variable z;

equations obj,const ,cap(i),cap2(i);

obj..z=E= sum (i,p(i)*x(i));

const..sum(i,x(i)/pr(i))=L=H;

cap(i)..x(i)=L=Mc(i);

cap2(i)..x(i)=G=pt(i);

MODEL problem_1 for/all/;

solve problem_1 using lp max z;

Display x.L,z.L;

Report:

Incase maximize production rate: A(200) -> 300 && B(140) ->210 && C(160) -> 240

Profit = 285625.000000

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Incase maximize production rate: A(300) -> 450 && B(210) -> 315 && C(240) -> 360

Profit = 371500.000000

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Incase maximize production rate: A(450) -> 675 && B(315) -> 472.5 && C(360) -> 540

Profit = 371500.000000 // equal to the previous step

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Incase maximize production capacity: A(6000) -> 9000 && B(4000) -> 6000 && C(3500) -> 5250

Profit = 195455.357143

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Incase maximize production capacity: A(9000) -> 13500 && B(6000) -> 9000 && C(5250) -> 7875

Profit = 195455.357143 // equal to the previous step

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