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1 a. DIK C_f : Rp. 8000
   C_v : Rp. 65
   P : Rp. 180
   V_p : 300

TC $= C_f + V_p \cdot C_v$
$= $ Rp. 8000 $+$ 200 $\cdot$ Rp. 65
$= $ Rp. 27.500

$V = \dfrac{C_f}{P - C_v} = \dfrac{Rp. 8000}{Rp.180 - Rp.65} = \dfrac{Rp. 8000}{Rp. 115} = 69,57$

b. Fungsi primal

Max $z = 5x_1 + 7x_2$
batasan $\longrightarrow$ $2x_1 + x_2 \leq 8$
$x_1 + 2x_2 \leq 8$
$6x_1 + 7x_2 \leq 42$
$x_1, x_2, x_3 \geq 0$

Fungsi dual

Min $Y = 8y_1 + 8y_2 + 42y_3$
batasan $\longrightarrow$ $2y_1 + y_2 + 6y_3 \geq 5$
$y_1 + 2y_2 + 7y_3 \geq 7$

2. Fungsi tujuan
$z = 3x_1 + 2x_2$ $\Rightarrow$ $z - 3x_1 - 2x_2 = 0$

Fungsi batasan
$x_1 + x_2 \leq 15$ $\Rightarrow$ $x_1 + x_2 + S_1 = 15$
$2x_1 + x_2 \leq 28$ $\Rightarrow$ $2x_1 + x_2 + S_2 = 28$
$x_1 + 2x_2 \leq 20$ $\Rightarrow$ $x_1 + 2x_2 + S_3 = 20$

Var dsr	Z	x_1	x_2	S_1	S_2	S_3	NK	Index
Z	1	-3	-2	0	0	0	0	
S_1	0	1	1	1	0	0	15	15
x_1	0	②	1	0	1	0	28	14
S_3	0	1	2	0	0	1	20	20

baris baru kunci $[\; 1 \quad \frac{1}{2} \quad 0 \quad \frac{1}{2} \quad 0 \quad 14\;]$

* baris Z
  baris lama
  NBBk
  baris baru

$$\frac{-3 \quad -2 \quad 0 \quad 0 \quad 0 \quad 0}{-3\,[\,1 \quad \tfrac{1}{2} \quad 0 \quad \tfrac{1}{2} \quad 0 \quad 14\,]} -$$
$$\overline{0 \quad -\tfrac{1}{2} \quad 0 \quad \tfrac{1}{2} \quad 0 \quad 42}$$

* baris S_1
  baris lama
  NBBk
  baris baru

$$\frac{1 \quad 1 \quad 1 \quad 0 \quad 0 \quad 15}{1\,[\,1 \quad \tfrac{1}{2} \quad 0 \quad \tfrac{1}{2} \quad 0 \quad 14\,]} -$$
$$\overline{0 \quad \tfrac{1}{2} \quad 1 \quad -\tfrac{1}{2} \quad 0 \quad 1}$$

* baris S_3
  baris lama
  NBBk
  baris baru

$$\frac{1 \quad 2 \quad 0 \quad 0 \quad 1 \quad 20}{1\,[\,1 \quad \tfrac{1}{2} \quad 0 \quad \tfrac{1}{2} \quad 0 \quad 14\,]} -$$
$$\overline{0 \quad \tfrac{3}{2} \quad 0 \quad -\tfrac{1}{2} \quad 1 \quad 6}$$

var ds	z	x_1	x_2	S_1	S_2	S_3	NK	index
Z	1	0	$-\tfrac{1}{2}$	0	$\tfrac{3}{2}$	0	42	43
x_2	0	0	$(\tfrac{1}{2})$	1	$-\tfrac{1}{2}$	0	1	2
x_1	0	1	$\tfrac{1}{2}$	1	$\tfrac{1}{2}$	0	14	13
S_3	0	0	$\tfrac{3}{2}$	0	$-\tfrac{1}{2}$	1	6	3

baris baru kunci $[\,0 \quad 1 \quad 2 \quad -1 \quad 0 \quad 2\,]$

* baris Z
  baris lama
  NBBk
  baris baru

$$\frac{0 \quad -\tfrac{1}{2} \quad 0 \quad \tfrac{3}{2} \quad 0 \quad 42}{-\tfrac{1}{2}\,[\,0 \quad 1 \quad 2 \quad -1 \quad 0 \quad 2\,]}$$
$$\overline{0 \quad 0 \quad 1 \quad 1 \quad 0 \quad 43}$$

* baris x_1
  baris lama
  NBBk
  baris baru

$$\frac{1 \quad \tfrac{1}{2} \quad 1 \quad \tfrac{1}{2} \quad 0 \quad 14}{\tfrac{1}{2}\,[\,0 \quad 1 \quad 2 \quad -1 \quad 0 \quad 2\,]} -$$
$$\overline{1 \quad 0 \quad -1 \quad 1 \quad 0 \quad 13}$$

* baris S_3
  baris lama
  NBBk
  baris baru

$$\frac{0 \quad \tfrac{3}{2} \quad 0 \quad -\tfrac{1}{2} \quad 1 \quad 6}{\tfrac{3}{2}\,[\,0 \quad 1 \quad 2 \quad -1 \quad 0 \quad 2\,]} -$$
$$\overline{0 \quad 0 \quad -3 \quad 1 \quad 1 \quad 3}$$

$x_1 : 13$
$x_2 : 2$
$Z_{max} : 43$

2a. table NWC

	Gudang A	Gudang B	Gudang C	Kapasitas
Pabrik W	20 ㊿	5 ⑨⓪	8	90
Pabrik H	15	24 ⑥⓪	10	60
Pabrik P	25	10 ⑩	19 ㊵	50
kebutuhan	50	110	40	200

Total cost = (50 . 20) + (40 . 5) + (60 . 24) + (10 . 10) + (40 . 19)
= 3260

b. table MODI

* Perbaikan 1.

	Gudang A	Gudang B	Gudang C	Kapasitas
Pabrik W	20 50 − ← ⑨⓪	5 40 +	8	90
Pabrik H	15 ㊿ +	20 ⑩ 60 −	10	66
Pabrik P	25	10 ⑩	19 ㊵	50
kebutuhan	50	110	40	200

Total cost = (90 . 5) + (50 . 15) + (10 . 20) + (40 . 19) + (10 . 10)
= 2260

* Perbaikan 2

	Gudang A	Gudang B	Gudang C	Kapasitas
Pabrik W	20	5 ⑨⓪	8	90
Pabrik H	15 ㊿	20 40 −	10 ⑩ +	60
Pabrik P	25	10 ⑳ 40 +	19 ㉚ 40 −	50
kebutuhan	50	40	40	200

Total cost = (90 . 5) + (30 . 19) + (50 . 15) + (10 . 10) + (20 . 10)
= 2070

* Perbaikan 3

	gudang A	gudang B	gudang C	kapasitas
pabrik W	20	(60) 96 $\xleftarrow{5}$	(30) 8	90
pabrik H	(50) 15	20	(10) 10	60
pabrik P	25	(50) 20 $\xrightarrow{10}$	30 19	50
kebutuhan	50	110	40	200

Total cost : $(60 \cdot 5) + (30 \cdot 8) + (50 \cdot 15) + (10 \cdot 10) + (50 \cdot 10)$
= 1890

4. Metode hungarian

(I)

	I	II	III	IV
A	65	(50)	60	70
B	55	(45)	60	55
C	(50)	60	75	70
D	(40)	55	65	60

(II)

	I	II	III	IV
A	15	0	(10)	20
B	10	0	15	(10)
C	0	10	25	20
D	05	15	25	20

(III)

	I	II	III	IV
A	15	0	0	10
B	10	0	5	6
C	0	10	15	10
D	0	15	15	10

(IV)

	I	II	III	IV
A	65	50	(60)	70
B	55	(45)	60	55
C	(50)	60	75	70
D	40	55	65	(60)

alokasi karyawan
ani → memotong : 60
budi → memasak : 45
ceri → adonan : 50
dodi → mengemas : 60 +
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215 × 1000 = 215 000