

HW -Ch 6-Section 6.4 Graph-based Construction Method

6.18 The ABC Cooling and Heating Company manufactures several different types of air conditioners. Five departments are involved in the processing required for the products. A summary of the processing sequences required for the five major products and the weekly production volumes for the products are shown in the tables below along with the department area. Based on the graph-based construction method, develop a block layout.

Product	Process Sequence	Weekly Production	
1	ABC	150	
2	ABED	200	
3	ACE	50	
4	ACBE	200	
5	ADE	250	

Department	Area (ft ²)
A	1500
В	1500
С	1000
D	2000
E	2000

6.19 The activity relationship chart for Walter's machine shop is shown in the figure below. The space requirements are in square feet. Construct the relationship diagram and develop a block layout using the graph-based method.

CELL A	1,000
CELL B	1,200 7
CELL C	1,000 4 8 5
CELL D	1,200 8 2 7
CELL E	2,000 \ 5 \ 6 \ 0
CELL F	1,000 0 0 1
CELL G	1,600 0 7
CELL H	800 0

Dept.	A	В	С	D	Е	F	G	Н
A		302	0	0	0	66	0	68
В	0		504	20	136	154	56	40
С	0	0	_	76	352	0	122	94
D	0	0	0	_	0	0	180	8
E	0	0	0	0	_	122	0	282
F	0	0	0	0	0		188	24
G	0	0	0	0	0	0		296
Н	0	0	0	0	0	0	0	

6.20 The from-to material flow matrix for an eight-department facility is given in the table below. Construct a relationship diagram based on the material flow matrix, and construct a block layout using the graph-based method.

Dept.	Area Required (ft ²)
A	2800
В	2100
С	2600
. D	400
E	600
F	400
G	2300
H	1800

- 6.21 Consider the layout of five equal-sized departments. The material flow matrix is given in the figure below.
 - Develop the final adjacency graph using the graph-based procedure.
 - b. Develop a block layout based on the final adjacency graph obtained in part a.

	A	В	С	D	Е
A		0	5	25	15
В	0	_	20	30	25
С	0	25	 ·	40	30
D	30	5	20	_	0
E	20	30	5	10	

6.22 The material flow matrix for 10 departments is given below.

		T								
	A	В	С	D	E	F	G	H	I	J
A		0	12	0	132	16	0	220	20	24
В	0		176	0	216	0	144	128	0	0
С	0	0		0	0	184	0	0	28	0
D	212	136	240		36	0	236	0	164	0
E	0	0	140	0		0	192	0	0	160
F	0	180	0	188	108	_	248	228	0	0
G	172	0	156	0	0	0	_	112	224	152
H	0	0	32	40	204	0	0	_	0	0
I	0	168	0	0	104	156	0	148		200
J	0	124	196	120	0	116	0	108	0	_

The area requirements are

Dept.	Area (ft²)			
A	400			
В	1000			
С	2600			
D	400			
Е	2400			
F	1000			
G	3600			
Н	1200			
I	400			
J	2400			

- Determine a final adjacency graph using the graph-based procedure.
- b. Construct a block layout based on the adjacency graph in part a.