Section 7 – Reciprocal Cost Allocation Method

1) Alfred, owner of Hi-Tech Fiberglass Fabricators, Inc., is interested in using the reciprocal allocation method. The following data from operations were collected for analysis:

Budgeted manufacturing overhead costs:

Plant Maintenance	PM (Support Dept)	$370,000
Data Processing	DP (Support Dept)	$70,000
Machining	M (Operating Dept)	$235,000
Capping	C (Operating Dept)	$110,000

Services furnished:

By Plant Maintenance (budgeted labor-hours):	
to Data Processing	3900
to Machining	5100
to Capping	8100
By Data Processing (budgeted computer time):	
to Plant Maintenance	700
to Machining	3500
to Capping	650

Which of the following linear equations represents the complete reciprocated cost of the Data Processing Department?

A) DP= $70,000 + (700 / 4850) PM
B) DP= $70,000 + (3900/ 17,100) PM
C) DP= $70,000 × (700 / 4850) + $370,000 × (3900 / 17,100)
D) DP= $370,000 + (700 / 17,100) DP
Answer: B

2) Alfred, owner of Hi-Tech Fiberglass Fabricators, Inc., is interested in using the reciprocal allocation method. The following data from operations were collected for analysis:

Budgeted manufacturing overhead costs:

Plant Maintenance	PM (Support Dept)	$380,000
Data Processing	DP (Support Dept)	$60,000
Machining	M (Operating Dept)	$210,000
Capping	C (Operating Dept)	$150,000

Services furnished:

By Plant Maintenance (budgeted labor-hours):	
to Data Processing	3600
to Machining	5400
to Capping	8000
By Data Processing (budgeted computer time):	

to Plant Maintenance	800
to Machining	4200
to Capping	600

What is the complete reciprocated cost of the Plant Maintenance Department? (Do not round any intermediary calculations.)
A) $411,143
B) $400,693
C) $440,000
D) $404,957
Answer: B
Explanation: DP = $60,000 + (3600 / 17,000) PM
PM = $380,000 + (800 / 5600) DP
PM = $380,000 + (800 / 5600) × [$60,000 + (3600 / 17,000) PM]
PM = $380,000 + $8571 + (0.030252)PM
0.969748 PM = $388,571
PM = $400,693

3) Alfred, owner of Hi-Tech Fiberglass Fabricators, Inc., is interested in using the reciprocal allocation method. The following data from operations were collected for analysis:

Budgeted manufacturing overhead costs:

Plant Maintenance	PM (Support Dept)	$320,000
Data Processing	DP (Support Dept)	$100,000
Machining	M (Operating Dept)	$245,000
Capping	C (Operating Dept)	$140,000

Services furnished:

By Plant Maintenance (budgeted labor-hours):	
to Data Processing	3600
to Machining	5000
to Capping	8800
By Data Processing (budgeted computer time):	
to Plant Maintenance	750
to Machining	3700
to Capping	800

What is the complete reciprocated cost of the Data Processing Department? (Do not round any intermediary calculations.)

A) $220,000
B) $120,690
C) $149,210
D) $171,269
Answer: D
Explanation: DP = $100,000 + (3600 / 17,400) PM
PM = $320,000 + (750 / 5250) DP
PM = $320,000 + (750 / 5250) × [$100,000 + (3600 / 17,400) PM]
PM = $320,000 + $14,286 + (0.029557)PM
0.970443 PM = $334,286
PM = $344,467

PM = $344,467 ; DP = $100,000 + (3600 / 17,400) PM
DP = $100,000 + (3600 / 17,400) $344,467 = $171,269

4) Hugo, owner of Automated Fabric, Inc., is interested in using the reciprocal allocation method. The following data from operations were collected for analysis:

Budgeted manufacturing overhead costs:

Maintenance	M (Support Dept)	$400,000
Personnel	P (Support Dept)	$150,000
Weaving	W (Weaving Dept)	$620,000
Colorizing	C (Colorizing Dept)	$360,000

Services furnished:

By Maintenance (budgeted labor-hours):	
to Personnel	1000
to Weaving	8000
to Colorizing	4100
By Personnel (Number of employees serviced):	
Plant Maintenance	12
Weaving	36
Colorizing	23

Which of the following linear equations represents the complete reciprocated cost of the Personnel Department?

A) P = $400,000 - $150,000 (1000 / 13,100) M
B) P = (1000 / 13,100) M
C) P = $150,000 + (1000 / 13,100) M
D) P = $150,000
Answer: C

5) Hugo, owner of Automated Fabric, Inc., is interested in using the reciprocal allocation method. The following data from operations were collected for analysis:

Budgeted manufacturing overhead costs:

Maintenance	M (Support Dept)	$340,000
Personnel	P (Support Dept)	$140,000
Weaving	W (Weaving Dept)	$690,000
Colorizing	C (Colorizing Dept)	$440,000

Services furnished:

By Maintenance (budgeted labor-hours):	
to Personnel	1800
to Weaving	7500
to Colorizing	4600
By Personnel (Number of employees serviced):	
Plant Maintenance	9
Weaving	40
Colorizing	29

What is the complete reciprocated cost of the Maintenance Department? (Do not round any intermediary calculations.)
A) $361,556
B) $356,154
C) $340,000
D) $0
Answer: A
Explanation: P = $140,000 + (1800 / 13,900) M
M = $340,000 + (9 / 78) P
M = $340,000 + (9 / 78) × [$140,000 +(1800 / 13,900) M]
M = $340,000 + $16,154 + (0.014942) M
0.985058 M = $356,154
M = $361,556

6) Hugo, owner of Automated Fabric, Inc., is interested in using the reciprocal allocation method. The following data from operations were collected for analysis:

Budgeted manufacturing overhead costs:

Maintenance	M (Support Dept)	$350,000
Personnel	P (Support Dept)	$180,000
Weaving	W (Weaving Dept)	$660,000
Colorizing	C (Colorizing Dept)	$380,000

Services furnished:

By Maintenance (budgeted labor-hours):	
to Personnel	1000
to Weaving	7600
to Colorizing	4500
By Personnel (Number of employees serviced):	
Plant Maintenance	6
Weaving	34
Colorizing	27

What is the complete reciprocated cost of the Personnel Department? (Do not round any intermediary calculations.)

A) $170,000
B) $208,140
C) $180,000
D) $213,012
Answer: B
Explanation: P = $180,000 + (1000 / 13,100) M
M = $350,000 + (6 / 67) P
M = $350,000 + (6 / 67) × [$180,000 +(1000 / 13,100) M]
M = $350,000 + $16,119 + (0.006836) M
0.993164 M = $366,119
M = $368,639
P = $180,000 + (1000 / 13,100) M
P = $180,000 + (1000 / 13,100) ($368,639)
P = $208,140