

I.
(35 points)

Allied Adhesives (AA) manufactures specialty bonding agents for very specialized applications (electronic circuit boards, aerospace, health care, etc.). AA operates a number of small plants around the world, each one specializing in particular products for its niche market. AA has a small plant in St. Louis that manufactures aerospace epoxy resins and a larger plant in Atlanta that manufactures epoxies for electronics. Each produces somewhat similar epoxy resins that are sold to different customers. The manufacturing processes of the aerospace and electronic adhesives are quite similar, but the selling processes and the types of customers are very different across the two divisions. The St. Louis plant is being closed and moved to Atlanta to economize on duplicative selling, general, and administrative costs (SGA). Aerospace and Electronics will continue to operate as separate divisions. The following table summarizes the current operations of the two plants:

	<i>Aerospace (St. Louis)</i>	<i>Electronics (Atlanta)</i>
Revenue	\$16.800	\$42.100
Manufacturing cost	<u>8.568</u>	<u>23.155</u>
Manufacturing margin	\$ 8.232	\$18.945
SGA-variable	5.376	12.630
SGA-fixed	<u>1.900</u>	<u>2.500</u>
Net income	<u>\$ 0.956</u>	<u>\$ 3.815</u>
Return on sales	<u>5.69%</u>	<u>9.06%</u>

NOTE: Costs in millions.

After Aerospace moves to the Atlanta facility, each division continues to operate as a separate profit center, and neither Aerospace nor Electronics is expected to have its revenues, manufacturing cost, or variable SGA impacted. The only change projected from moving Aerospace to Atlanta is the total fixed SGA will fall from \$4.4 million to \$3.0 million through elimination of redundant occupancy, administrative, and human resource expenses.

AA evaluates its divisional managers based on return on sales (net income divided by sales).

Required:

- Prepare separate financial statements reporting *net income* and *return on sales* for Aerospace and Electronics after the move where the expected lower fixed SGA of \$3 million is allocated to the two divisions using:
 - Revenues as the allocation base.
 - Manufacturing cost as the allocation base.
 - Manufacturing margin as the allocation base.(Round all allocations to the nearest \$1,000.)
- Discuss how moving Aerospace into Atlanta affects the relative profitability of the Aerospace and Electronics divisions. (5 sentences)
- Which of the three possible allocation schemes in part (a) will each division manager (Aerospace and Electronics) prefer? Why? (5 sentences)

d. which method should AA use? why? (6 sentences)

II.
(50 Points)

Bristol Corporation manufactures several different types of printed circuit boards; however, two of the boards account for the majority of the company's sales. The first of these boards, a television circuit board, has been a standard in the industry for several years. The market for this type of board is competitive and price-sensitive. Bristol plans to sell 65,000 of the TV boards in 19x9 at a price of \$150 per unit. The second high-volume product, a personal computer circuit board, is a recent addition to Bristol's product line. Because the PC board incorporates the latest technology it can be sold at a premium price. The 19x9 plans include the sale of 40,000 PC boards at \$300 per unit.

Bristol's management group is meeting to discuss how to spend the sales and promotion dollars for 19x9. The sales manager believes that the market share for the TV board could be expanded by concentrating Bristol's promotional efforts in this area. In response to this suggestion, the production manager said, "Why don't you go after a bigger market for the PC board? The cost sheets that I get show that the contribution from the PC board is more than double the contribution from the TV board. I know we get a premium price for the PC board. Selling it should help overall profitability."

Bristol's cost-accounting system shows that the following costs apply to the PC and TV boards.

	PC Board	TV Board
Direct material	\$140	\$80
Direct labor	4 hr.	1.5 hr.
Machine time	1.5 hr.	.5 hr.

Variable manufacturing overhead is applied on the basis of direct-labor hours. For 19x9, variable overhead is budgeted at \$1,120,000, and direct-labor hours are estimated at 280,000. The hourly rates for machine time and direct labor are \$10 and \$14, respectively. Bristol applies a material-handling charge at 10 percent of material cost. This material-handling charge is not included in variable manufacturing overhead. Total 19x9 expenditures for direct material are budgeted at \$10,600,000.

Andrew Fulton, Bristol's controller, believes that before the management group proceeds with the discussion about allocating sales and promotional dollars to individual products, it might be worthwhile to look at these products on the basis of the activities involved in their production. Welch has prepared the following schedule to help the management group understand this concept.

"Using this information," Fulton explained, "we can calculate an activity-based cost for each TV board and each PC board and then compare it to the standard cost we have been using. The only cost that remains the same for both cost methods is the cost of direct material. The cost drivers will replace the direct labor, machine time, and overhead costs in the old standard cost figures."

Budgeted Cost		Cost Driver	Budgeted Annual Activity for Cost Driver
Procurement	\$ 400,000	Number of parts	4,000,000 parts
Production scheduling	220,000	Number of boards	110,000 boards
Packaging and shipping	440,000	Number of boards	110,000 boards
Total	<u>\$1,060,000</u>		
Machine setup	\$446,000	Number of setups	278,750 setups
Hazardous waste disposal	48,000	Pounds of waste	16,000 pounds
Quality control	560,000	Number of inspections	160,000 inspections
General supplies	66,000	Number of boards	110,000 boards
Total	<u>\$1,120,000</u>		
Machine insertion	\$1,200,000	Number of parts	3,000,000 parts
Manual insertion	4,000,000	Number of parts	1,000,000 parts
Wave-soldering	132,000	Number of boards	110,000 boards
Total	<u>\$5,332,000</u>		

Required per Unit	PC Board	TV Board
Parts:	55	25
Machine insertions	35	24
Manual insertions	20	1
Machine setups	3	2
Hazardous waste disposal35 lb.	.02 lb.
Inspections	2	1

Required:

- what is the unit cost of a PC board & a TV board using
 - the old method
 - the ABC method (activity based costing)
- what useful insights does ABC give in this case?

III.
(35 points)

The Brandilyn Toy Company manufactures a line of dolls and a doll dress sewing kit. Demand for the dolls is increasing, and management requests assistance from you in determining the best sales and production mix for the coming year. The company has provided the following data:

	A	B	C	D	E
		Demand Next Year	Selling Price per Unit	Direct Materials	Direct Labor
1	Product	(units)			
2	Marcy	26,000	\$35.00	\$3.50	\$4.80
3	Tina	42,000	\$24.00	\$2.30	\$3.00
4	Can	40,000	\$22.00	\$4.50	\$8.40
5	Lenny	46,000	\$18.00	\$3.10	\$6.00
6	Sewing kit	450,000	\$14.00	\$1.50	\$2.40
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The following additional information is available:

- The company's plant has a capacity of 150,000 direct labor-hours per year on a single-shift basis. The company's present employees and equipment can produce all five products.
- The direct labor rate of \$12.00 per hour is expected to remain unchanged during the coming year.
- Fixed costs total \$356,000 per year. Variable overhead costs are \$4.00 per direct labor-hour.
- All of the company's nonmanufacturing costs are fixed.
- The company's finished goods inventory is negligible and can be ignored.

- 1) What is the contribution margin of each toy? (Assume Direct Labor is Variable)
- 2) How many total direct labor hours are needed to meet demand next year?
- 3) If only 150,000 direct labor hours are available, how many units of each toy should be produced next year to maximize contribution margin?