Production and Operations Management 2nd Edition Starr Test Bank

Chapter 1: Product Line Planning and the Systems Approach

TRUE/FALSE

1.	Goals and strategies must be congruent and realistic.						
	ANS: T	PTS:	1	REF:	1-Strategic Thinking		
2.	Operations manager	nent is t	he systematic p	olanning	g and control of operations.		
	ANS: T	PTS:	1	REF:	1-1b		
3.	Jobs in the service in	ndustrie	s pay better tha	n jobs i	n manufacturing.		
	ANS: F	PTS:	1	REF:	1-1b		
4.	The functional field environment.	approac	ch is essential fo	or P/OM	I planning and decision making in a global		
	ANS: F	PTS:	1	REF:	1-1c		
5.	There are two appro	aches th	at P/OM can us	se: the f	functional field approach and the systems approach.		
	ANS: T	PTS:	1	REF:	1-2		
6.	The functional field approach entails having all participants cooperate in solving problems that require mutual involvement.						
	ANS: F	PTS:	1	REF:	1-2		
7.	The functional field complex situations,	approac enabling	ch leads to bette g those that use	er decisi it to be	ons and provides better problem solving for more successful.		
	ANS: F	PTS:	1	REF:	1-2b		
8.	Elements that qualif problem or its soluti	y to be j on; on t	part of a system he plan or the d	are the lecision	ose that have a direct or indirect impact on the .		
	ANS: T	PTS:	1	REF:	1-2c		
9.	The key to understand interact to create the	nding th e system	e relevant syste in which the re	em is to eal prob	identify all of the main players and elements that lem resides.		
	ANS: T	PTS:	1	REF:	1-2c		
10.	The functional field	approac	h requires iden	tificatio	on of all the elements related to purposes and goals.		
	ANS: F	PTS:	1	REF:	1-3		
11.	The system approac	h requir	es control of tir	ning.			
	ANS: T	PTS:	1	REF:	1-3		

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- 12. The system approach requires teamwork.
 - ANS: T PTS: 1 REF: 1-3
- 13. Operations management problems are composed of complex subsystems, which require interfunctional communications to uncover the patterns that relate to the subsystems of the whole system.

ANS: T PTS: 1 REF: 1-3a

- 14. There are more differences than similarities between P/OM manufacturing and OM service organizations.
 - ANS: F PTS: 1 REF: 1-4
- 15. The methodology of P/OM was first developed by and for service, but is has now been extended to manufacturing with great success.

ANS: T PTS: 1 REF: 1-4

16. Service industries employ an increasing percent of the workforce.

ANS: T PTS: 1 REF: 1-4

17. Comparing goods and services, the similarities stop, and significant differences occur, when the operations involve contact between people.

ANS: T PTS: 1 REF: 1-4

18. Care should be taken to avoid stereotyping services as being all too human, and, therefore, difficult to control for quality and productivity.

ANS: T PTS: 1 REF: 1-4

19. Manufacturers do not view customer service as part of product quality.

ANS: F PTS: 1 REF: 1-5

20. The current ratio of service jobs to manufacturing jobs is nearly four to one.

ANS: T PTS: 1 REF: 1-5

21. Growing recognition of the importance of the service function in manufacturing has narrowed the breadth of situations to which the term *operations* is applied.

ANS: F PTS: 1 REF: 1-5a

22. Programming and maintenance (both service functions) have become decreasingly important to manufacturing.

ANS: F PTS: 1 REF: 1-5a

23. The trend for manufacturing is that the labor component (the input of blue-collar workers) has been increasing as a percent of the cost of goods at an accelerating rate for over 50 years.

ANS: F PTS: 1 REF: 1-5a

24. The systems approach does not require communication between functions and the sharing of mutually exclusive databases.

ANS: F PTS: 1 REF: 1-5a

25. The manufacturing transformation of raw materials into finished goods is successful if customers are willing to pay more for the goods than it costs to make them.

ANS: T PTS: 1 REF: 1-6

26. In service, the conversion is successful if customers are willing to pay more for the services than it costs to provide them.

ANS: T PTS: 1 REF: 1-6

27. Cost management is not a key function associated with all aspects of P/OM.

ANS: F PTS: 1 REF: 1-6a

28. In the airline industry, total fixed costs decrease as there are more flights flown and more people flying.

ANS: F PTS: 1 REF: 1-6a

29. Variable costs are also called indirect costs because they cannot be applied directly, without ambiguity, to each unit that is processed.

ANS: F PTS: 1 REF: 1-6a

30. Depreciation is calculated by dividing the cost of the investment by the number of years in the estimated lifetime of the investment.

ANS: T PTS: 1 REF: 1-6a

31. The manufacturer can measure input in terms of the number of units of each kind of product it produces.

ANS: F PTS: 1 REF: 1-6a

32. The profit model operates differently according to the stage of development of the company's input-output operating system.

ANS: T PTS: 1 REF: 1-8

33. The stage reflects the degree to which a company's activities have been coordinated and carried out.

ANS: T PTS: 1 REF: 1-8

34. It is not necessary to relate the company's stage of development to that of its competitors.

ANS: F PTS: 1 REF: 1-8

35. Each company's input-output model indirectly and directly reflects the impact of the competitors' input-output models.

ANS: T PTS: 1 REF: 1-8

36. Stage I companies have a high level of basic advantages that are unique to them, whereas Stage IV companies have virtually none.

ANS: F PTS: 1 REF: 1-8a

37. Long term P/OM planning requires excellence in project management to bring about changes needed to adapt to new environments.

ANS: T PTS: 1 REF: 1-8a

38. P/OM is at the hub of the business model and requires an understanding of the various functional business partners to achieve successful strategic planning.

ANS: T PTS: 1 REF: 1-9

39. The director of quality is accountable for controlling the flow of input materials to the line.

ANS: F PTS: 1 REF: 1-9f

40. The systems point of view requires consideration of P/OM dealing with all business functions, such as marketing and finance.

ANS: T PTS: 1 REF: 1-The Systems Viewpoint

41. Most production managers will accept being called by the title of operations manager.

ANS: T PTS: 1 REF: 1-The Systems Viewpoint

42. If the part operations managers play in the overall organization model is to be effective, it should be systems-based.

ANS: T PTS: 1 REF: 1-The Systems Viewpoint

43. In the systems viewpoint, everything that is important to goal achievement doesn't have to be included in the analysis for the analysis to be effective.

ANS: F PTS: 1 REF: 1-The Systems Viewpoint

44. Strategies do not have to be changed if goals can't be achieved.

ANS: F PTS: 1 REF: 1-The Systems Viewpoint

45. The systems viewpoint requires strategic planning.

ANS: T PTS: 1 REF: 1-Strategic Thinking

46. Understanding global competitors requires an understanding of their strategies within the context of the national character of their operations management system.

	ANS: F	PTS:	1	REF:	1-Strategic Thinking			
47.	Product line planning is the starting point for strategic planning.							
	ANS: T	PTS:	1	REF:	1-1			
48.	Operations managers platform, the process	learn h perfori	low to study a p nance can be in	process nproved	by observing it and mapping its flow. From that 1.			
	ANS: T	PTS:	1	REF:	1-1			
49.	P/OM uses qualitative effects of velocity an	e descr d time (iptions to build on distance trav	models veled.	s or representations of the real situation to test the			
	ANS: F	PTS:	1	REF:	1-1a			
50.	A general quantitativ function of the produ	e mode ction ra	that describes the per hour (p)	output and the	is $O = pt$, where O is output per day. O changes as a e length of time worked (t).			
	ANS: T	PTS:	1	REF:	1-1a			
51.	Movies are one of the	e bigges	st export produ	cts of th	e United States.			
	ANS: T	PTS:	1	REF:	1-1c			
52.	Teamwork across the organization is easier to achieve with self-contained functions.							
	ANS: F	PTS:	1	REF:	1-2			
53.	The sports team and systems approach.	its man	agement is a go	ood exa	mple of a purposeful effort that is hindered by the			
	ANS: F	PTS:	1	REF:	1-3a			
54.	The relevance of serv manufacturer must de	vice to c eliver.	customers is of	decreas	ing importance as part of the total package that the			
	ANS: F	PTS:	1	REF:	1-5a			
55.	Production and operations management is linked to all other managerial functions in the organization and is applicable to both manufacturing and services.							
	ANS: T	PTS:	1	REF:	1-Introduction			
MUL	TIPLE CHOICE							
1.	Operations managem	ent is r	esponsible for _	, `	which should be a thoughtful progression from one			
	a. a plan of work b. market share			c. d.	profit public service objectives			

ANS: A PTS: 1 REF: 1-1b

2.	Operations management uses that consists of procedures, rules of thumb, and algorithms for analyzing situations and setting polices.					
	a. tacticsb. methodology			c. d.	services product-mix	
	ANS: B	PTS:	1	REF:	1-1b	
3.	With the appr other parts of the bus the product or delive	oach, oj siness. T r the se	perations mana This approach o rvice.	igement concentr	is expected to perform with minimum reference to rates on the specific tasks that must be done to make	
	a. systems			c.	functional field	
	b. customer relation	nship		d.	operations	
	ANS: C	PTS:	1	REF:	1-2	
4.	The approach a. systems b. functional field	integra	tes P/OM deci	sions wi c. d.	th those of all other business functions. customer relationship systematic-constructive	
	ANS: A	PTS:	1	REF:	1-2	
5.	The systems approac which is characterist	h called	d is base e sciences.	ed on the	e analytic reduction of systems into their parts,	
	a. extraspectionb. construction			c. d.	introspection contemplation	
	ANS: C	PTS:	1	REF:	1-2a	
6.	The systems approac	h called	d is chai	acteristi	c of philosophy and the humanities.	
	a. construction b interspection			c. d	introspection extraspection	
	ANS: D	PTS∙	1	REF.	1-2a	
7		1 1		1		
7.	a. interspection.	a synth	esis to obtain t	ne syste c.	construction.	
	b. extraspection.			d.	introspection.	
	ANS: C	PTS:	1	REF:	1-2a	
8.	The system is decisions, quality sta a. purchasing b. accounting	everyth ndards,	ning that affect inventory leve	s produced s, and produced s, and produced structure str	et line formulation, process planning, capacity production schedules. P/OM distribution	
	ANS: C	PTS:	1	REF:	1-2c	
9.	Managing a sports te approach.	am is a	n excellent exa	imple of	a purposeful effort that is enhanced by using the functional field	
	b. customer relation	nship		d.	operations	
	ANS: A	PTS:	1	REF:	1-2b	

10. Using the systems approach to coordinate the business-unit team is essential to

	a. balance supply ab. meet schedules.	nd dem	and.	c. d.	minimize costs. all of the above
	ANS: D	PTS:	1	REF:	1-3a
11.	Similarities between in information	service proces	s and sing.	manufacturing ca	an be noted when service operations are based upon
	b. repetitive steps	.5		d.	similar steps
	ANS: B	PTS:	1	REF:	1-4
12.	A significant differen	nce betv	veen t	the provision of s	ervices and manufacturing occurs because of
	a. inventory.b. contact between	people.		c. d.	both a and b neither a nor b
	ANS: C	PTS:	1	REF:	1-4
13.	is the tradition a. Operations mana b. Production mana	nal term igement	for n	nanaging activitie c. d.	s used to produce (and deliver) goods to customers. Component manufacturing Transformation
	ANS: B	PTS:	1	REF:	1-5
14.	The current ratio of s one-to-one ratio in th a. four-to-one b. five-to-one	service j ne 1950s	obs to s.	o manufacturing j c. d.	obs is nearly, compared to an approximate three-to-one two-to-one
	ANS: A	PTS:	1	REF:	1-5
15.	provide(s) neo required services.	cessary	data a	bout customer ne	eeds so that operations management can supply the
	a. Operations manab. Production mana	igement igement	- - -	c. d.	Information systems Service systems
	ANS: C	PTS:	1	REF:	1-5a
16.	are (is) increa a. Services b. Manufacturing	singly r	espon	sive to—and con c. d.	trolled by—information systems. Service and manufacturing none of the above
	ANS: C	PTS:	1	REF:	1-5a
17.	One of the most imp have lower utility (for a. transformation b. translation	ortant fu	unctio mers)	ons of the P/OM s before this funct c. d.	system is Raw materials and components ion is employed. creation production
	ANS: A	PTS:	1	REF:	1-6
18.	needed to carr a. Time b. Space	ry out th	ie trar	nsformation funct c. d	ion determines the production rate. Input Cost
	ANS: A	PTS:	1	REF:	1-6

19.	 The are combined by the process, resulting in the production of units of goods or the creation types of services after transformation. a. outputs c. inputs 						
	b. inputs and outputs d			d.	none of the above		
	ANS: C	PTS:	1	REF:	1-6		
20.	The model de	picts wo	ork being done.				
	a. translationb. transportation	-	-	c. d.	input-output production		
	ANS: C	PTS:	1	REF:	1-6		
21.	Transformations are	being a	ccomplished wl	hen peo	ple are		
	a. served chili at Wendy's.b. giving blood to the Red Cross.			с. d.	visiting Walt Disney World. all of the above		
	ANS: D	PTS:	1	REF:	1-6		
22.	For the most part, ex	penses a	are readily cate	gorized	into costs.		
	a. variable			c.	fixed		
	b. fixed and variabl	e		d.	overhead		
	ANS: B	PTS:	1	REF:	1-6a		
23.	The input component transportation proces	t of the s would	transformation l include	model	that applies to the main utility of an airline		
	a. fuel.b. food.			с. d.	crew. all of the above		
	ANS: A	PTS:	1	REF:	1-6a		
24.	Indirect costs that are familiar such cost is	e part of	Foverhead costs	s must b	be allocated to units of output by some formula. A		
	a. variable cost.b. direct cost.			с. d.	total cost. depreciation.		
	ANS: D	PTS:	1	REF:	1-6a		
25.	5. Passengers pay the airline for transportation. The number of passengers (units) that are transported (processed) by the airline is a critical measure of the of the system.						
	b. output			d.	net worth		
	ANS: B	PTS:	1	REF:	1-6a		
26.	The model ass outputs, and the trans	signs the	e costs and reve ion process—al	enues of 1 based	the traditional equation of profit to the inputs, the on a specific period of time.		
	a. revenue b. L/O profit			С.	P/OM transformation		
	b. I/O profit	D		u.			
	ANS: B	PTS:	1	REF:	1-7		
27.	The input-output pro	fit mod	el shows that				
	a. $P = R - TC$. b. $TC - FC + vc(V)$			с. d	both a and b neither a nor b		
	0. IC = IC + VC(V)	•		u.			

28.	companies op changing the produc	erate or tion pro	the premise th cess.	nat there	e is no competitive advantage to be gained by
	a. Stage Ib. Stage IV			c. d.	Stage II Stage V
	ANS: A	PTS:	1	REF:	1-8
29.	. Stage I b. Stage II	actice c	ontinuous impr	covemen c. d.	it, which means they persistently remove waste. Stage IV Stage V
	ANS: C	PTS:	1	REF:	1-8a
30.	A Stage comp when requested.	oany is o	centered on me	eting sh	ipment quotas and providing minimum service
	a. VI			c.	I
		DTLG	1	a.	1
	ANS: C	PTS:	1	REF:	1-8a
31.	A Stage comp to those used by the	oany ins leading	talls and mana companies.	ges man	ufacturing and service processes that are equivalent
	a. I b. II			с. d.	III V
	ANS: C	PTS:	1	REF:	1-8a
32.	A Stage comp integrated.	oany is a	a P/OM innova	tor. It h	as short and long term planning horizons that are
	a. IV			c.	I
	b. V			d.	111
	ANS: A	PTS:	1	REF:	1-8a
33.	is defined as s bureaucratic arthritis	starting and su	from scratch to ccessfully jump	o redesig p stages.	gn a system, and is an appealing way to circumvent
	a. Redesigning			c. d	Reengineering Reevaluating
	ANS: C	PTS:	1	REF:	1-8a
24					
34.	is the stage at position.	which	P/OM develop	ment is i	internally supportive to the company's competitive
	a. Stage I			c.	Stage III
	b. Stage II			d.	Stage IV
	ANS: C	PTS:	1	REF:	1-8a
35.	Managers of operation positions, meaning the second	ons in so hey are	ervices and the responsible for	product	tion manager in a manufacturing plant are in line

- a. providing guidance on quality.
- b. providing advice on work schedules.
- c. providing information on cost.
- d. producing products or services.

	ANS: D	PTS:	1	REF:	1-9b
36.	The is in charged a. performance imp b. project manager c. director of qualit d. inventory manage	ge of th proveme y er	e various qualit ent manager	ty activi	ities that are going on in the firm.
	ANS: C	PTS:	1	REF:	1-9f
37.	consultants are a. Internal b. External	e usuall	y engaged in p	roject n c. d.	nanagement. Internal and external none of the above
	ANS: C	PTS:	1	REF:	1-9g
38.	The traditional textbo systematically throug a. circular b. linear	ook pub gh a seri	lishing process les of steps.	is c. d.	It begins at a certain point and proceeds disjointed detached
	ANS: B	PTS:	1	REF:	Spotlight 1-2
39.	allows the stat a. P/OM b. Marketing	te of a p	roduction proc	ess to b c. d.	e assessed. Management Finance
	ANS: A	PTS:	1	REF:	1-1
40.	A permits P/C relationship: $m = vt$ a. model b. prototype	OM to te t, where	st the effect of m is miles driv	differen ven, v is c. d.	nt variables, like <i>t</i> and <i>v</i> in the following s velocity, and <i>t</i> is time in hours. draft mock-up
	ANS: A	PTS:	1	REF:	1-1a
41.	The systems approac a. provides better so b. is superior to the c. provides better p d. all of the above	h olutions functio roblem	a. nal field approa solving for cor	ach. nplex s	ituations.
	ANS: D	PTS:	1	REF:	1-2b
42.	Elements that qualify a. direct impact on b. indirect impact o c. impact the soluti d. all of the above	to be p the prol on the pr on, plar	oart of a system olem. roblem. 1 or decision.	are tho	ose that have a
	ANS: D	PTS:	1	REF:	1-2c
43.	Operations managem	nent pro	blems are		

- a. composed of complex subsystems.b. require interfunctional communication.
- c. have patterns that relate the subsystems to the whole system.

d. all of the above

ANS: D

44.	A Stage	_ company is n	nore p	proactive than a S	Stage	_ company.
	a. III, IV			с.	II, III	
	b. II, I			d.	II, IV	
	ANS: B	PTS:	1	REF:	1-8	

PTS: 1

SHORT ANSWER

1. Discuss the two key roles of quality assurance as they relate to the publishing process.

ANS:

Quality assurance has two key roles: 1. enforcing strict quality standards across all functional groups and 2. interacting with and supporting the end-users, both students and instructors.

REF: 1-3a

PTS: 1 REF: Spotlight 1-2

2. How does Atomic Dog/Cengage Learning get its products to market faster and cheaper than traditional publishers?

ANS:

The power of the model used by Atomic Dog/Cengage Learning Publishing is a continuous, nonlinear one. It is interactive and by design is faster and cheaper. The process supports interaction and feedback on both problems and new feature requests. The process results in a continuously evolving textbook and is similar to the software revision process.

PTS: 1 REF: Spotlight 1-2

3. How is the term operations defined? Why is the term *operations* used for manufacturing?

ANS:

Operations are purposeful actions or activities methodically done as part of a plan of work or a strategy by a process that is designed to achieve practical ends or objectives. This definition is applicable for manufacturing without reservation and this definition further justifies the use of the term *operations* for manufacturing.

PTS: 1 REF: 1-1b

4. Briefly identify the various tactics included within the scope of operations management.

ANS:

Operations management, in brief, consists of tactics such as scheduling work, assigning resources including people and equipment, managing inventories, assuring quality standards, process-type decisions that include capacity decisions, maintenance policies, equipment selection, worker-training options, and the sequence for making individual items in a product-mix set.

PTS: 1 REF: 1-1b

5. Discuss the connections to P/OM in the organization chart. Does the structure support teamwork?

ANS:

There are typically no lines connecting people in the other functional areas (finance, marketing, etc.) to people in P/OM. The only connection is at the president's level. Within the P/OM area, there are a limited number of connections and these are typically hierarchically structured. The traditional organizations chart does not reflect the systems approach wherein anyone can talk to anyone else if they are part of the problem or the solution. Teamwork is also difficult within these self-contained functions.

PTS: 1 REF: 1-2

6. Why is a systems approach to P/OM required?

ANS:

The systems approach is needed because it produces better solutions than other approaches, e.g., this includes the functional field approach. It is similar to the sports team where players are coordinated by communication and training to play a better game. In business, those using the systems approach are the leading companies in every industry.

PTS: 1 REF: 1-2b

7. Discuss the issue of inventory in both services and manufacturing,

ANS:

Another significant difference between the provision of services and manufacturing occurs because of inventory. It is not possible to stock or inventory services (like a haircut) as it is in manufacturing (like a toaster). For example, when the machine repairperson or hair stylist is idle, there is no way to build up an inventory of hours that can be used later when two machines go down at the same time or when two people want their hair cut at the same time. In most service businesses, this is one of the great waste factors.

PTS: 1 REF: 1-4

8. What is the difference between production management and operations management?

ANS:

Production is an older term used by engineers, economists, entrepreneurs, and managers to describe the physical work both in homes and in factories to produce a material product. *Operations management* is a more recent term associated with services performed by organizations such as banks, insurance companies, fast-food servers, and airlines.

PTS: 1 REF: 1-5

9. Discuss the role of information systems in services and manufacturing.

ANS:

Information systems provide the necessary data about customer needs so that operations management can supply the required services. Both services and manufacturing are increasingly responsive to—and controlled by—information systems. Therefore, knowledge of computers, computer programming, networking and telecommunications is essential in both the manufacturing and service environment.

PTS: 1 REF: 1-5a

10. Discuss the type of worker who might prefer to work in a job shop environment.

ANS:

Job shops, with their batch production systems, appeal to people who prefer repetitive assignments within a relatively hectic environment. The job shop generally involves a lot of people interactions and negotiations. The tempo of batch production is related to the number of setups, cleanups, and changeovers.

PTS: 1 REF: 1-9a

PROBLEM

1. Lee's Manufacturing plant and equipment cost \$100 million and are estimated to have a lifetime of 20 years. Straight-line depreciation is to be used. Additional fixed costs per year are \$7 million. Variable costs are \$2 and the price per unit is \$3. What will annual profit be if the annual volume is 15 million units?

ANS:

Annual depreciation = 100/20 years = 5 million per year Fixed costs = 7,000,000Total *FC* = 5,000,00 + 7,000,000 = 12,000,000*p* = 3 and *vc* = 2, so (*p* - *vc*) = (3 - 2) = 1. Profit *P* = 1 (V) - 12,000,000.

For V = 15,000,000, p = 1(15,000,000) - 12,000,000 = \$3,000,000

PTS: 1 REF: 1-7

2. Daisy's Dog Beds plant and equipment cost \$20,000 and are estimated to have a lifetime of 10 years. Straight-line depreciation is to be used. Additional fixed costs per year are \$15,000. Variable costs are \$8 and the price per bed is \$25. What will annual profit be if the annual volume is 25,000 units?

ANS:

Annual depreciation = 20,000/10 years = 2,000 per year Fixed costs = 15,000Total *FC* = 2,000 + 15,000 = 17,000*p* = 25 and *vc* = 8, so (*p* - *vc*) = (25 - 8) = 17. Profit *P* = 17 (V) - 17,000.

For V = 25,000, p = 17(25,000) - 17,000 = \$408,000

PTS: 1 REF: 1-7

3. A local carpet manufacturer's plant and equipment cost \$285,000 and are estimated to have a lifetime of 20 years. Straight-line depreciation is to be used. Additional fixed costs per year are \$130,000. Variable costs are \$200 per roll of carpet and the price per roll is \$3,000. What will annual profit be if the annual volume is 15,000 rolls?

ANS: Annual depreciation = \$285,000/20 years = \$14,250 per year Fixed costs = \$130,000Total FC = \$14,250 + \$130,000 = \$144,250p = \$3,000 and vc = \$200, so (p - vc) = (\$3,000 - \$200) = \$2,800. Profit P = \$2,800 (V) - \$12,000,000.

For *V* = 15,000, *p* = 2,800(15,000) - 144, 250 = \$41,855,750

PTS: 1 REF: 1-7

4. A Chinese manufacturer of ladies blouses has plant and equipment costing the equivalent of \$100,000 and are estimated to have a lifetime of 20 years. Straight-line depreciation is to be used. Additional fixed costs per year are \$70,000. Variable costs are \$2.50 and the price per unit is \$3.75 What will annual profit be if the annual volume is 95,000 blouses?

ANS: Annual depreciation = 100,000/20 years = 5,000 per year Fixed costs = 70,000Total *FC* = 5,000 + 70,000 = 75,000*p* = 3.75 and *vc* = 2.50, so (*p* - *vc*) = (3.75 - 2.50) = 1.25Profit *P* = 1.25 (*V*) - 75,000.

For V = 95,000, p = 1.25(95,000) - 75,000 = \$43,750

PTS: 1 REF: 1-7

5. A local pest control company has equipment cost \$150,000 and it is estimated to have a lifetime of 7.5 years using a straight line depreciation. Additional fixed costs per year are \$100,000. Variable costs per pest control service are \$40 and the price per unit averages \$125. What will annual profit be if the company services 475 customers annually? How many customers are needed to break even?

ANS: Annual depreciation = \$150,000/7.5 years = \$20,000 per year Fixed costs = \$100,000Total *FC* = \$20,000 + \$100,000 = \$120,000p = \$125 and vc = \$40, so (p - vc) = (\$125 - \$40) = \$85. Profit *P* = \$85 (V) - \$120,000.

For V = 475, p = 85(475) - 120,000 = net loss of -\$79,625

Break even occurs when revenue = costs, so 85(V) = 120,000. Solve for V or volume and we find the break even number of customers to serve is 1,411.8 or 1,412. After serving 1,412 customers, the company will have covered total costs and then be profitable. Assuming a systems perspective, working with marketing and finance can help to increase the customer base and control costs to achieve the desired profitability.

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