

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 1: Correlation and Regression

Question: 1

A company is an automobile replacement parts dealer in a large metropolitan community. The company is preparing its sales forecast for the coming year. Data regarding both the company's and industry sales of replacement parts as well as both the used and new automobile sales in the community for the last 10 years have been accumulated. If the company wants to determine whether its sales of replacement parts are dependent upon the industry sales of replacement parts or upon the sales of used and new automobiles, the company should employ

- A. Simulation techniques.
- B. Correlation and regression analysis.
- C. Statistical sampling.
- D. Time series analysis.

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Question: 2 A company has accumulated data for the last 24 months in order to determine if there is an independent variable that could be used to estimate shipping costs. Three possible independent variables being considered are packages shipped, miles shipped, and pounds shipped. The quantitative technique that should be used to determine whether any of these independent variables might provide a good estimate for shipping costs is

- A. Flexible budgeting.
- B. Linear programming.
- C. Linear regression.
- D. Variable costing.

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 1: Correlation and Regression

Question: 3 In the standard regression equation $y = a + bx$, the letter b is **best** described as a(n)

- A. Independent variable.
- B. Dependent variable.
- C. Constant coefficient.
- D. Variable coefficient.

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 1: Correlation and Regression

Question: 4 The correlation coefficient that indicates the weakest linear association between two variables is

- A. -0.73
- B. -0.11
- C. 0.12
- D. 0.35

Question: 5 Correlation is a term frequently used in conjunction with regression analysis and is measured by the value of the coefficient of correlation, r . The **best** explanation of the value r is that it

- A. Is always positive.
- B. Interprets variances in terms of the independent variable.
- C. Ranges in size from negative infinity to positive infinity.
- D. Is a measure of the relative relationship between two variables.

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 1: Correlation and Regression

Question: 6 A regression equation

- A. Estimates the dependent variable.
- B. Encompasses factors outside the relevant range.
- C. Is based on objective and constraint functions.
- D. Estimates the independent variable.

Question: 7 What coefficient of correlation results from the following data?

$\frac{X}{1}$	$\frac{Y}{10}$
2	8
3	6
4	4
5	2

- A. 0
- B. -1
- C. +1
- D. Cannot be determined from the data given.

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 1: Correlation and Regression

Question: 8 All of the following are assumptions underlying the validity of linear regression output **except**

- A. The errors are normally distributed.
- B. The mean of the errors is zero.
- C. Certainty.
- D. The standard deviation of the errors is constant.

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 1: Correlation and Regression

Fact Pattern:

In preparing the annual profit plan for the coming year, Wilkens Company wants to determine the cost behavior pattern of the maintenance costs. Wilkens has decided to use linear regression by employing the equation $y = a + bx$ for maintenance costs. The prior year's data regarding maintenance hours and costs, and the results of the regression analysis, are given below and in the opposite column.

Average cost per hour	\$9.00
a	684.65
b	7.2884
Standard error of a	49.515
Standard error of b	.12126
Standard error of the estimate	34.469
r^2	.99724

	Hours of Activity	Maintenance Costs
January	480	\$ 4,200
February	320	3,000
March	400	3,600
April	300	2,820
May	500	4,350
June	310	2,960
July	320	3,030
August	520	4,470
September	490	4,260
October	470	4,050
November	350	3,300
December	340	3,160
Sum	<u>4,800</u>	<u>\$43,200</u>
Average	400	\$ 3,600

Question: 9

Based upon the data derived from the regression analysis, 420 maintenance hours in a month would mean that Wilkens Co.'s maintenance costs (rounded to the nearest dollar) would be budgeted at

- A. \$3,780
- B. \$3,600
- C. \$3,790
- D. \$3,746

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Sum	<u>4,800</u>	<u>\$43,200</u>
Average	400	\$ 3,600

Question: 10 The percentage of Wilkens Co.'s total variance that can be explained by the regression equation is

- A. 99.724%
- B. 69.613%
- C. 80.982%
- D. 99.862%

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Question: 11 The letter x in the standard regression equation is **best** described as a(n)

- A. Independent variable.
- B. Dependent variable.
- C. Constant coefficient.
- D. Coefficient of determination.

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Question: 12 In regression analysis, which of the following correlation coefficients represents the strongest relationship between the independent and dependent variables?

A. 1.03

B. $-.02$

C. $-.89$

D. $.75$

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 1: Correlation and Regression

Question: 13 The internal auditor of a bank has developed a multiple regression model which has been used for a number of years to estimate the amount of interest income from commercial loans. During the current year, the auditor applies the model and discovers that the r^2 value has decreased dramatically, but the model otherwise seems to be working okay. Which of the following conclusions are justified by the change?

- A. Changing to a cross-sectional regression analysis should cause r^2 to increase.
- B. Regression analysis is no longer an appropriate technique to estimate interest income.
- C. Some new factors, not included in the model, are causing interest income to change.
- D. A linear regression analysis would increase the model's reliability.

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 1: Correlation and Regression

Fact Pattern: Alpha Company produces several different products and is making plans for the introduction of a new product, which it will sell for \$6 a unit. The following estimates have been made for manufacturing costs on 100,000 units to be produced the first year:

Direct materials	\$500,000
Direct labor	\$40,000 (the labor rate is \$4/hour)

Overhead costs have not been established for the new product, but monthly data on total production and overhead cost for the past 24 months have been analyzed using simple linear regression. The results below were derived from the simple regression and provide the basis for overhead cost estimates for the new product.

Dependent variable (y) -- Factory overhead costs
Independent variable (x) -- Direct labor hours

Computed values:

y intercept	\$40,000
Coefficient of independent variable	\$2.10
Coefficient of correlation	0.953
Standard error of estimate	\$2,840
Standard error of regression coefficient	0.42
Mean value of independent variable	\$18,000
Coefficient of determination	0.908

Question: 14 What percentage of the variation in Alpha's overhead costs is explained by the independent variable?

- A. 90.8%
- B. 42%
- C. 48.8%
- D. 95.3%

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Question: 15 Alpha's total overhead cost for an estimated activity level of 20,000 direct labor hours would be

- A. \$42,000
- B. \$82,000
- C. \$122,000
- D. \$222,000

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 1: Correlation and Regression

Question: 16 The manager of the assembly department of a company would like to estimate the fixed and variable components of the department's cost. To do so, the manager has collected information on total cost and output for the past 24 months. To estimate the fixed and variable components of total cost, the manager should use

- A. Regression analysis.
- B. Game theory.
- C. Sensitivity analysis.
- D. Queuing theory.

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 1: Correlation and Regression

Question: 17 In determining cost behavior in business, the cost function is often expressed as $y = a + bx$. Which one of the following cost estimation methods should **not** be used in estimating fixed and variable costs for the equation?

- A. Graphic method.
- B. Simple regression.
- C. High and low point method.
- D. Multiple regression.

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 1: Correlation and Regression

Question: 18 For cost estimation, simple regression differs from multiple regression in that simple regression uses **only**

- A. One dependent variable, while multiple regression uses all available data to estimate the cost function.
- B. Dependent variables, while multiple regression can use both dependent and independent variables.
- C. One independent variable, while multiple regression uses more than one independent variable.
- D. One dependent variable, while multiple regression uses more than one dependent variable.

Question: 19 A manufacturer developed the following multiple regression equation, utilizing many years of data, and uses it to model, or estimate, the cost of its product.

$$\text{Cost} = FC + (a \times L) + (b \times M)$$

Where: FC = fixed costs

L = labor rate per hour

M = material cost per pound

Which one of the following changes would have the greatest impact on invalidating the results of this model?

- A. A significant reduction in factory overheads, which are a component of fixed costs.
- B. Renegotiation of the union contract calling for much higher wage rates.
- C. A large drop in material costs, as a result of purchasing the material from a foreign source.
- D. A significant change in labor productivity.

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 1: Correlation and Regression

Question: 20 In order to analyze sales as a function of advertising expenses, the sales manager developed a simple regression model. The model included the following equation, which was based on 32 monthly observations of sales and advertising expenses with a related coefficient of determination of .90.

$$\text{Sales} = \$10,000 + (2.5 \times \text{Advertising expenses})$$

If the advertising expenses in one month amounted to \$1,000, the related point estimate of sales would be

- A. \$2,500
- B. \$11,250
- C. \$12,250
- D. \$12,500

Question: 21 The results of regressing Y against X are as follows:

	<u>Coefficient</u>
Intercept	5.23
Slope	1.54

When the value of X is 10, the estimated value of Y is

- A. 6.77
- B. 8.05
- C. 20.63
- D. 53.84

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 1: Correlation and Regression

Question: 22 While gathering information to use in preparing the annual budget, a company identifies cost drivers associated with manufacturing costs. Which one of the following is a quantitative analysis method the company can use to measure the average change in the manufacturing costs associated with a change in a cost driver?

- A. Time series analysis.
- B. Exponential smoothing.
- C. Regression analysis.
- D. Learning curve analysis.

Question: 23 A company uses simple regression to predict one of its semi-variable costs. The computed equation of $y = -25,000 + 2.5x$ appears to have a good visual fit. The cause of the negative term in this equation could be that

- A. The zero level of output is outside of the relevant range.
- B. Too many outliers were included in the data.
- C. An inappropriate cost driver was used as the independent variable.
- D. The cost does not exhibit semi-variable behavior.

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 1: Correlation and Regression

Question: 24

A single-product company uses regression to predict one of its factory overhead costs with materials used as the independent variable. The regression equation is as follows: $Y = 542,000 + 0.0000253X$. Based on R^2 , management has determined that this model captures a significant portion of the relationship.

The behavior of this company's factory overhead cost with respect to units of finished goods produced is

- A. Fixed.
- B. Semivariable.
- C. Variable.
- D. Not determinable from the provided information.

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 1: Correlation and Regression

Question: 25 A nationwide retail mattress firm will begin selling high-end crib mattresses next year. Management believes sales for this product will be driven primarily by birth rates but will be influenced to a lesser extent by income levels. The **best** method to use to predict next year's sales is

- A. Simple regression.
- B. Time-series regression.
- C. Multiple regression.
- D. Maximum likelihood regression.

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 1: Correlation and Regression

Question: 26 A cleaning company is evaluating the costs to clean a standard office. The controller has done a linear regression of the hours spent cleaning various offices and the total costs (labor, supplies, transportation) for each office cleaned. The regression analysis yielded the following information.

$$y = \$25x + \$75$$

y = the total cost to clean an office

x = the hours spent cleaning an office

What is the **best** description of the costs of cleaning an office based on this regression analysis?

- A. The cost is \$100 per hour to clean an office.
- B. There is \$25 of fixed costs and \$75 of variable costs per hour to clean an office.
- C. There is \$25 of variable costs per hour and \$75 of fixed costs to clean an office.
- D. The cost is \$25 per hour to clean an office.

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 1: Correlation and Regression

Question: 27 A company uses regression analysis in which monthly advertising expenses are used to predict monthly product sales, both in millions of dollars. The results show a regression coefficient for the independent variable equal to 0.8. This coefficient value indicates that

- A. On average, every additional dollar of advertising results in \$0.8 of additional sales.
- B. Advertising is not a good predictor of sales because the coefficient is so small.
- C. When monthly advertising is at its average level, product sales will be \$800,000.
- D. The average monthly advertising expenditure in the sample is \$800,000.

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 1: Correlation and Regression

Question: 28 An accountant for a biotechnology company is working on a projection of next year's maintenance expenditures for the company's laboratory equipment used in research and development. By analyzing past maintenance expenditures, the accountant was able to determine that future maintenance expenditures can be expressed by the following simple regression equation: $Y = \$20,000 + (\$50 \times X)$. The variable X is the number of hours the laboratory equipment has been in service. For the previous year, the variable X was determined to be 4,500 hours. If the accountant is projecting that X will be 5,000 hours next year, how much should the accountant project for next year's maintenance expenditures?

- A. \$225,000
- B. \$245,000
- C. \$250,000
- D. \$270,000

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 1: Correlation and Regression

Question: 29 An electronics company has developed a regression model to forecast quarterly sales. The model explains the relationship between the company's sales and the amount it spends on marketing activities. The regression equation for the model is expressed below.

$$s = \$3(m) + \$150,000$$

s = sales per quarter

m = dollars spent on marketing activities per quarter

If the company has forecasted sales of \$189,000 for the next quarter, what amount is it planning to spend on marketing activities in the next quarter?

- A. \$13,000
- B. \$39,000
- C. \$63,000
- D. \$113,000

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 2: Learning Curve Analysis

Question: 30

An entity is preparing a bid for a special project requiring the production of 35,000 units. The engineering personnel have advised that the units can be produced in groups with the first group consisting of 1,000 units. A review of prior experience indicates that the direct labor time needed per unit will be progressively smaller by a constant percentage rate as experience is gained in the production process. The quantitative method that would **best** estimate the entity's total cost for the project is

- A. Linear programming.
- B. Dynamic programming.
- C. Learning curve analysis.
- D. Time series analysis.

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 2: Learning Curve Analysis

Question: 31 The average labor cost per unit for the first batch produced by a new process is \$120. The cumulative average labor cost after the second batch is \$72 per product. Using a batch size of 100 and assuming the learning curve continues, the total labor cost of four batches will be

- A. \$4,320
- B. \$10,368
- C. \$2,592
- D. \$17,280

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 2: Learning Curve Analysis

Fact Pattern:

Moss Point Manufacturing recently completed and sold an order of 50 units that had costs as shown in the next column.

The company has now been requested to prepare a bid for 150 units of the same product.

Direct materials	\$ 1,500
Direct labor ($\$8.50 \times 1,000$ hours)	8,500
Variable overhead ($1,000$ hours \times $\$4.00$)*	4,000
Fixed overhead**	<u>1,400</u>
	<u>\$15,400</u>

*Applied on the basis of direct labor hours.

**Applied at the rate of 10% of variable cost.

Question: 32 If an 80% learning curve is applicable, Moss Point's total cost on this order would be estimated at

- A. \$26,400
- B. \$32,000
- C. \$38,000
- D. \$41,800

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 2: Learning Curve Analysis

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Variable overhead ($1,000 \text{ hours} \times \4.00)*	4,000
Fixed overhead**	1,400
	<u>\$15,400</u>

*Applied on the basis of direct labor hours.

**Applied at the rate of 10% of variable cost.

Question: 33 If Moss Point had experienced a 70% learning curve, the bid for the 150 units would

- A. Show a 30% reduction in the total direct labor hours required with no learning curve.
- B. Include increased fixed overhead costs.
- C. Be 10% lower than the total bid at an 80% learning curve.
- D. Include 6.40 direct labor hours per unit at \$8.50 per hour.

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 2: Learning Curve Analysis

Question: 34 A corporation manufactures specialty components for the electronics industry in a highly labor intensive environment. A manufacturer has asked the corporation to bid on a component that the corporation made for the manufacturer last month. The previous order was for 80 units and required 120 hours of direct labor to manufacture. The manufacturer would now like 240 additional components. The corporation experiences an 80% learning curve on all of its jobs. The number of direct labor hours needed for the corporation to complete the 240 additional components is

- A. 360.0
- B. 187.2
- C. 307.2
- D. 256.0

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 2: Learning Curve Analysis

Question: 35 A particular manufacturing job is subject to an estimated 90% learning curve. The first unit required 50 labor hours to complete. What is the cumulative average time per unit after four units are completed?

- A. 50.0 hours.
- B. 45.0 hours.
- C. 40.5 hours.
- D. 40.0 hours.

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 2: Learning Curve Analysis

Question: 36 A particular manufacturing job is subject to an estimated 80% learning curve. The first unit required 50 labor hours to complete. What is the cumulative average time per unit after eight units are completed?

- A. 20.0 hours.
- B. 25.6 hours.
- C. 32.0 hours.
- D. 40.0 hours.

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 2: Learning Curve Analysis

Question: 37 A particular manufacturing job is subject to an estimated 80% learning curve. The first unit required 50 labor hours to complete. If the learning curve is based on a cumulative average time per unit assumption, what is the time required to complete the second unit?

- A. 30.0 hours.
- B. 40.0 hours.
- C. 45.0 hours.
- D. 50.0 hours.

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 2: Learning Curve Analysis

Question: 38 A learning curve of 80% assumes that direct labor costs are reduced by 20% for each doubling of output. What is the incremental cost of the sixteenth unit produced as an approximate percentage of the first unit produced?

- A. 41%
- B. 31%
- C. 80%
- D. 64%

Question: 39

A new manufacturer in the production of airplane propellers has to train its employees in the process of making propellers. To increase the speed of learning, the manufacturer will give a bonus to the employee with the lowest cumulative average time per unit after eight units are completed. L took 50 hours to complete the first unit, and she is subject to an 80% learning curve. S took 60 hours to complete the first unit, and she is subject to a 70% learning curve. M took 40 hours to complete the first unit, and she is subject to a 90% learning curve. P took 55 hours to complete the first unit, and she is subject to a 75% learning curve. Which employee will receive the bonus?

- A. L.
- B. S.
- C. M.
- D. P.

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 2: Learning Curve Analysis

Question: 40 It is estimated that a particular manufacturing job is subject to an 80% learning curve. The first unit required 50 labor hours to complete. What is the cumulative average time per unit after completing four units?

- A. 50.0 hours.
- B. 40.0 hours.
- C. 32.0 hours.
- D. 30.0 hours.

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 2: Learning Curve Analysis

Question: 41 A company plans to bid on a special project that calls for a total of 24,000 units. The units will be produced in lots, with the first lot consisting of 750 units. Based on prior experience, the direct labor time needed per unit of product will be progressively smaller by a constant percentage rate as experience is gained in the manufacturing process. The quantitative method that would **best** estimate the company's total cost for the project is

- A. Learning curve techniques.
- B. Differential calculus.
- C. Discounted cash flow techniques.
- D. Linear programming.

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 2: Learning Curve Analysis

Question: 42 An entity received a request for a competitive bid for the sale of one of its unique boating products with a desired modification. The entity is now in the process of manufacturing this product but with a slightly different modification for another customer. These unique products are labor intensive and both will have long production runs. Which one of the following methods should be used to estimate the cost of the new competitive bid?

- A. Expected value analysis.
- B. Learning curve analysis.
- C. Regression analysis.
- D. Continuous probability simulation.

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 2: Learning Curve Analysis

Question: 43 The technique used to predict the change in direct labor hours as a new process stabilizes is

- A. Simple regression.
- B. Multiple regression.
- C. Time series analysis.
- D. Learning curve analysis.

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 2: Learning Curve Analysis

Fact Pattern: LCB, Inc., is preparing a bid to produce engines. The company has experienced the following costs:

Cumulative Units Produced	Total Cumulative Costs	
	Materials	Labor
10	\$ 60,000	\$120,000
20	120,000	192,000
40	240,000	307,200

At LCB, variable overhead is applied on the basis of \$1.00 per direct labor dollar. Based on historical costs, LCB knows that the production of 40 engines will incur \$100,000 of fixed overhead costs. The bid request is for an additional 40 units; all companies submitting bids are allowed to charge a maximum of 25% above full cost for each order.

Question: 44 In order to ensure that the company would **not** lose money on the project, LCB's minimum bid for the 40 units would be

- A. \$760,800
- B. \$608,640
- C. \$885,800
- D. \$708,640

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Question: 45 LCB's rate of learning on the 3-year engine contract is

- A. 75.5%
- B. 79.0%
- C. 80.0%
- D. 62.6%

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Question: 46 The maximum bid price that LCB, Inc., could submit to the Department of the Navy for the 40 units is

- A. \$760,800
- B. \$608,640
- C. \$885,800
- D. \$708,640

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 2: Learning Curve Analysis

Fact Pattern: Donehart Corporation produces agricultural vehicles. Most of the component parts for these vehicles are subcontracted to reliable vendors. The final assembly of all vehicles is accomplished at Donehart's plant. Donehart's Engineering Department has developed a new fuel injection system that can be produced in-house because of the availability of production capacity. The first production run of the new fuel injection system has already been completed in-house. This 80-unit production run took 60 direct labor hours per unit to produce based on the cumulative average labor hours per fuel injection unit. Donehart has experienced an 80% learning curve with similar products, and this experience indicates that learning tends to cease by the time 640 systems are produced. Donehart's direct labor cost (including employee benefits) is \$18 per direct labor hour. Donehart's management must decide whether to continue producing the fuel injection system or to subcontract the work. Donehart's purchasing agent has received a proposal from Midland, Inc., a company specializing in fuel injection systems. From past contracts, Midland has proven to be efficient and reliable. The terms of Midland's proposal are outlined below.

- Donehart must supply all materials required for the fuel injection system units.
- The first 80 units produced by Midland will require direct labor input at the rate of 56 hours per unit. Current direct labor cost is \$20 per hour.
- The direct labor cost charged to Donehart will be the hourly rate in effect at the time the work is performed. Midland is currently negotiating its labor contract, which includes a 4% increase in direct labor cost and should be applicable when Donehart signs the contract.
- A learning curve factor of 75% will be applied through the first 640 units produced, and all benefits derived from the learning factor will accrue to Donehart.
- Donehart must pay the actual labor cost incurred plus a 5% margin.

Question: 47 If Donehart manufactures the units in-house, what is the average labor hours per unit after manufacturing 640 units?

- A. 60
- B. 30.72
- C. 23.63
- D. 23.04

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- Donehart must supply all materials required for the fuel injection system units.
- The first 80 units produced by Midland will require direct labor input at the rate of 56 hours per unit. Current direct labor cost is \$20 per hour.
- The direct labor cost charged to Donehart will be the hourly rate in effect at the time the work is performed. Midland is currently negotiating its labor contract, which includes a 4% increase in direct labor cost and should be applicable when Donehart signs the contract.
- A learning curve factor of 75% will be applied through the first 640 units produced, and all benefits derived from the learning factor will accrue to Donehart.
- Donehart must pay the actual labor cost incurred plus a 5% margin.

Question: 48 If Donehart manufactures the units in-house, how many total hours will it take to complete 1,000 units?

- A. 8,294.4 hours.
- B. 19,660.8 hours.
- C. 24,330 hours.
- D. 27,955.2 hours.

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 2: Learning Curve Analysis

Fact Pattern: Donehart Corporation produces agricultural vehicles. Most of the component parts for these vehicles are subcontracted to reliable vendors. The final assembly of all vehicles is accomplished at Donehart's plant. Donehart's Engineering Department has developed a new fuel injection system that can be produced in-house because of the availability of production capacity. The first production run of the new fuel injection system has already been completed in-house. This 80-unit production run took 60 direct labor hours per unit to produce based on the cumulative average labor hours per fuel injection unit. Donehart has experienced an 80% learning curve with similar products, and this experience indicates that learning tends to cease by the time 640 systems are produced. Donehart's direct labor cost (including employee benefits) is \$18 per direct labor hour. Donehart's management must decide whether to continue producing the fuel injection system or to subcontract the work. Donehart's purchasing agent has received a proposal from Midland, Inc., a company specializing in fuel injection systems. From past contracts, Midland has proven to be efficient and reliable. The terms of Midland's proposal are outlined below.

- Donehart must supply all materials required for the fuel injection system units.
- The first 80 units produced by Midland will require direct labor input at the rate of 56 hours per unit. Current direct labor cost is \$20 per hour.
- The direct labor cost charged to Donehart will be the hourly rate in effect at the time the work is performed. Midland is currently negotiating its labor contract, which includes a 4% increase in direct labor cost and should be applicable when Donehart signs the contract.
- A learning curve factor of 75% will be applied through the first 640 units produced, and all benefits derived from the learning factor will accrue to Donehart.
- Donehart must pay the actual labor cost incurred plus a 5% margin.

Question: 49 If Donehart manufactures the units in-house, how much additional cost will the company incur after the first batch in order to produce a total of 1,000 units?

- A. \$416,793.60
- B. \$463,104
- C. \$503,193.60
- D. \$559,104

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 2: Learning Curve Analysis

Fact Pattern: Donehart Corporation produces agricultural vehicles. Most of the component parts for these vehicles are subcontracted to reliable vendors. The final assembly of all vehicles is accomplished at Donehart's plant. Donehart's Engineering Department has developed a new fuel injection system that can be produced in-house because of the availability of production capacity. The first production run of the new fuel injection system has already been completed in-house. This 80-unit production run took 60 direct labor hours per unit to produce based on the cumulative average labor hours per fuel injection unit. Donehart has experienced an 80% learning curve with similar products, and this experience indicates that learning tends to cease by the time 640 systems are produced. Donehart's direct labor cost (including employee benefits) is \$18 per direct labor hour. Donehart's management must decide whether to continue producing the fuel injection system or to subcontract the work. Donehart's purchasing agent has received a proposal from Midland, Inc., a company specializing in fuel injection systems. From past contracts, Midland has proven to be efficient and reliable. The terms of Midland's proposal are outlined below.

- Donehart must supply all materials required for the fuel injection system units.
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- The direct labor cost charged to Donehart will be the hourly rate in effect at the time the work is performed. Midland is currently negotiating its labor contract, which includes a 4% increase in direct labor cost and should be applicable when Donehart signs the contract.
- A learning curve factor of 75% will be applied through the first 640 units produced, and all benefits derived from the learning factor will accrue to Donehart.
- Donehart must pay the actual labor cost incurred plus a 5% margin.

Question: 50 If Donehart subcontracts the order to Midland, what is the total number of labor hours required to produce the 640 units on the learning curve?

- A. 15,120 hours.
- B. 18,350 hours.
- C. 19,530 hours.
- D. 35,840 hours.

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 2: Learning Curve Analysis

Fact Pattern: Donehart Corporation produces agricultural vehicles. Most of the component parts for these vehicles are subcontracted to reliable vendors. The final assembly of all vehicles is accomplished at Donehart's plant. Donehart's Engineering Department has developed a new fuel injection system that can be produced in-house because of the availability of production capacity. The first production run of the new fuel injection system has already been completed in-house. This 80-unit production run took 60 direct labor hours per unit to produce based on the cumulative average labor hours per fuel injection unit. Donehart has experienced an 80% learning curve with similar products, and this experience indicates that learning tends to cease by the time 640 systems are produced. Donehart's direct labor cost (including employee benefits) is \$18 per direct labor hour. Donehart's management must decide whether to continue producing the fuel injection system or to subcontract the work. Donehart's purchasing agent has received a proposal from Midland, Inc., a company specializing in fuel injection systems. From past contracts, Midland has proven to be efficient and reliable. The terms of Midland's proposal are outlined below.

- Donehart must supply all materials required for the fuel injection system units.
- The first 80 units produced by Midland will require direct labor input at the rate of 56 hours per unit. Current direct labor cost is \$20 per hour.
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- A learning curve factor of 75% will be applied through the first 640 units produced, and all benefits derived from the learning factor will accrue to Donehart.
- Donehart must pay the actual labor cost incurred plus a 5% margin.

Question: 51 If Donehart subcontracts the order to Midland, how many hours will it take to complete a unit after the initial 640 units on the learning curve are finished?

- A. 11.81 hours.
- B. 15.75 hours.
- C. 21.50 hours.
- D. 23.625 hours.

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 2: Learning Curve Analysis

Fact Pattern: Donehart Corporation produces agricultural vehicles. Most of the component parts for these vehicles are subcontracted to reliable vendors. The final assembly of all vehicles is accomplished at Donehart's plant. Donehart's Engineering Department has developed a new fuel injection system that can be produced in-house because of the availability of production capacity. The first production run of the new fuel injection system has already been completed in-house. This 80-unit production run took 60 direct labor hours per unit to produce based on the cumulative average labor hours per fuel injection unit. Donehart has experienced an 80% learning curve with similar products, and this experience indicates that learning tends to cease by the time 640 systems are produced. Donehart's direct labor cost (including employee benefits) is \$18 per direct labor hour. Donehart's management must decide whether to continue producing the fuel injection system or to subcontract the work. Donehart's purchasing agent has received a proposal from Midland, Inc., a company specializing in fuel injection systems. From past contracts, Midland has proven to be efficient and reliable. The terms of Midland's proposal are outlined below.

- Donehart must supply all materials required for the fuel injection system units.
- The first 80 units produced by Midland will require direct labor input at the rate of 56 hours per unit. Current direct labor cost is \$20 per hour.
- The direct labor cost charged to Donehart will be the hourly rate in effect at the time the work is performed. Midland is currently negotiating its labor contract, which includes a 4% increase in direct labor cost and should be applicable when Donehart signs the contract.
- A learning curve factor of 75% will be applied through the first 640 units produced, and all benefits derived from the learning factor will accrue to Donehart.
- Donehart must pay the actual labor cost incurred plus a 5% margin.

Question: 52 If Donehart subcontracts the order to Midland, how much additional cost will Donehart incur after the first batch in order to obtain a total of 1,000 units?

- A. \$302,400
- B. \$330,220.80
- C. \$390,600
- D. \$426,535.20

Question: 53 Management of a bookkeeping company observed that the average time spent to perform identical tasks using a new software package decreases as the number of tasks performed increases. The following information on the use of the new software was collected.

<u>Number of Tasks Performed</u>	<u>Total Time to Perform All Tasks</u>	<u>Average Time to Perform Each Task</u>
1	10 minutes	10 minutes
2	18 minutes	9 minutes
4	32.4 minutes	8.1 minutes

If this learning effect continues, what is the average time to perform each of the first eight tasks?

- A. 7.29 minutes.
- B. 8.1 minutes.
- C. 6.56 minutes.
- D. 5.90 minutes.

Question: 54 Learning curves are **best** used to predict

- A. Unit material costs.
- B. Overhead variances.
- C. Total unit costs.
- D. Unit direct labor costs.

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 2: Learning Curve Analysis

Fact Pattern: Aerosub, Inc., has developed a new product for spacecraft that includes the production of a complex part. The manufacture of this part requires a high degree of technical skill. Management believes there is a good opportunity for its technical force to learn and improve as they become accustomed to the production process. The production of the first unit requires 10,000 direct labor hours. Management projects an 80% learning curve and wants to produce a total of eight units.

Question: 55 Upon completion of the eighth unit, Aerosub's cumulative average direct labor hours required per unit of the product will be

- A. 5,120 hours.
- B. 6,400 hours.
- C. 8,000 hours.
- D. 10,000 hours.

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 2: Learning Curve Analysis

Fact Pattern: Aerosub, Inc., has developed a new product for spacecraft that includes the production of a complex part. The manufacture of this part requires a high degree of technical skill. Management believes there is a good opportunity for its technical force to learn and improve as they become accustomed to the production process. The production of the first unit requires 10,000 direct labor hours. Management projects an 80% learning curve and wants to produce a total of eight units.

Question: 56 Upon completion of the eighth unit, Aerosub's cumulative direct labor hours will be

- A. 29,520 hours.
- B. 40,960 hours.
- C. 64,000 hours.
- D. 80,000 hours.

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 2: Learning Curve Analysis

Fact Pattern: Aerosub, Inc., has developed a new product for spacecraft that includes the production of a complex part. The manufacture of this part requires a high degree of technical skill. Management believes there is a good opportunity for its technical force to learn and improve as they become accustomed to the production process. The production of the first unit requires 10,000 direct labor hours. Management projects an 80% learning curve and wants to produce a total of eight units.

Question: 57 After completing the first unit, the estimated total direct labor hours Aerosub will require to produce the seven additional units will be

- A. 30,960 hours.
- B. 40,960 hours.
- C. 56,000 hours.
- D. 70,000 hours.

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 2: Learning Curve Analysis

Question: 58

A manufacturing company has the opportunity to submit a bid for 20 units of a product on which it has already produced two 10-unit lots. The production manager believes that the learning experience observed on the first two lots will continue for at least the next two lots. The direct labor required on the first two lots was as follows:

- 5,000 direct labor hours for the first lot of 10 units
- 3,000 additional direct labor hours for the second lot of 10 units

The learning rate experienced by the company on the first two lots of this product is

- A. 40.0%
- B. 60.0%
- C. 62.5%
- D. 80.0%

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 2: Learning Curve Analysis

Fact Pattern: Proper Propeller, Inc., plans to manufacture a newly designed high-technology propeller for airplanes. Proper Propeller forecasts that as workers gain experience, they will need less time to complete the job. Based on prior experience, Proper Propeller estimates a 70% cumulative learning curve and has projected the following costs:

Cumulative Number of Units Produced	Manufacturing Projections	
	Average Cost per Unit	Total Costs
1	\$20,000	\$20,000
2	14,000	28,000

Question: 59 If Proper Propeller produces eight units, the average manufacturing cost per unit will be

- A. \$1,647
- B. \$6,860
- C. \$9,800
- D. \$14,000

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 2: Learning Curve Analysis

Fact Pattern: Proper Propeller, Inc., plans to manufacture a newly designed high-technology propeller for airplanes. Proper Propeller forecasts that as workers gain experience, they will need less time to complete the job. Based on prior experience, Proper Propeller estimates a 70% cumulative learning curve and has projected the following costs:

<u>Cumulative Number of Units Produced</u>	<u>Manufacturing Projections</u>	
	<u>Average Cost per Unit</u>	<u>Total Costs</u>
1	\$20,000	\$20,000
2	14,000	28,000

Question: 60 If Proper Propeller produces eight units, the total manufacturing cost will be

- A. \$50,660
- B. \$54,880
- C. \$62,643
- D. \$112,000

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 2: Learning Curve Analysis

Fact Pattern: Proper Propeller, Inc., plans to manufacture a newly designed high-technology propeller for airplanes. Proper Propeller forecasts that as workers gain experience, they will need less time to complete the job. Based on prior experience, Proper Propeller estimates a 70% cumulative learning curve and has projected the following costs:

Cumulative Number of Units Produced	Manufacturing Projections	
	Average Cost per Unit	Total Costs
1	\$20,000	\$20,000
2	14,000	28,000

Question: 61 After completing production of the first propeller, the estimated cost for Proper Propeller to fill an order for seven additional propellers is

- A. \$34,880
- B. \$54,880
- C. \$92,000
- D. \$98,000

Question: 62 A manufacturer uses a cumulative average-time learning curve model to monitor labor costs. Data regarding two recently completed batches of a part that is used in tractor-trailer rigs is as follows:

Batch Number	Number of Units	Cumulative Average Hours Per Unit
1	50	20
2	50	16

If the same rate of learning continues for the next several batches produced, which of the following **best** describes (1) the type (i.e., degree) of learning curve that the firm is experiencing and (2) the average hours per unit for units included in the 201-400 range of units produced (i.e., the last 200 units)?

	Type (Degree) of Learning Curve	Average Hours Per Unit for Units 201-400
A.	20%	10.24
B.	80%	10.24
C.	80%	7.68
D.	20%	3.84

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 2: Learning Curve Analysis

Question: 63 A manufacturing company required 800 direct labor hours to produce the first lot of four units of a new motor. Management believes that a 90% learning curve will be experienced over four lots of production. How many direct labor hours will be required to manufacture the next 12 units?

A. 1,792

B. 1,944

C. 2,016

D. 2,160

Question: 64 Which one of the following will allow a better use of standard costs and variance analysis to help improve managerial decision-making?

- A. Company A does not differentiate between variable and fixed overhead in calculating its overhead variances.
- B. Company B uses the prior year's average actual cost as the current year's standard.
- C. Company C investigates only negative variances.
- D. Company D constantly revises standards to reflect learning curves.

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 2: Learning Curve Analysis

Question: 65 Which one of the following techniques would **most** likely be used to analyze reductions in the time required to perform a task as experience with that task increases?

- A. Regression analysis.
- B. Learning curve analysis.
- C. Sensitivity analysis.
- D. Normal probability analysis.

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 2: Learning Curve Analysis

Question: 66 A manufacturing firm plans to bid on a special order of 80 units that will be manufactured in lots of 10 units each. The production manager estimates that the direct labor hours per unit will decline by a constant percentage each time the cumulative quantity of units produced doubles. The quantitative technique used to capture this phenomenon and estimate the direct labor hours required for the special order is

- A. Cost-profit-volume analysis.
- B. The Markov process.
- C. Linear programming analysis.
- D. Learning curve analysis.

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 2: Learning Curve Analysis

Question: 67 Which one of the following statements **best** demonstrates the concept of the learning curve?

- A. A learning curve is a linear cost behavior influenced by learning.
- B. A learning curve is a judgmental method of estimating costs when learning is present.
- C. A learning curve is a percentage by which average time per unit produced decreases as output doubles.
- D. A learning curve is a percentage by which average time falls as output increases by 1.

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 2: Learning Curve Analysis

Question: 68 A corporation is developing a new product that will be manufactured in pairs. The company recently produced the first two units of this product using 200 hours of direct labor time. If the corporation has a 90% learning curve and uses the cumulative average-time learning model, the total direct labor time to manufacture the first four units of this new product is

- A. 400 hours.
- B. 380 hours.
- C. 360 hours.
- D. 324 hours.

Question: 69 The quantitative technique used to project the direct labor costs for full-scale production of a product from the initial run of the product is

- A. Learning curve analysis.
- B. Linear programming.
- C. Monte Carlo simulation.
- D. Expected value analysis.

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 2: Learning Curve Analysis

Question: 70 A company experiences a cumulative learning curve of 75% on the manufacturing of a particular electrical product. It takes 100 hours to make the first 500 units. How many hours will it take to make 2,000 units in total?

- A. 225.00
- B. 231.25
- C. 250.00
- D. 300.00

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 2: Learning Curve Analysis

Question: 71 A software company recently established a customer service department. After the first week, the average time required to handle one customer call was 15 minutes. The manager of the customer service department estimates an 80% learning curve. Under the cumulative average-time learning model, the cumulative average time required to handle one customer call by the fourth week will be

- A. 7.7 minutes.
- B. 9.6 minutes.
- C. 12.0 minutes.
- D. 15.0 minutes.

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 2: Learning Curve Analysis

Question: 72 A manufacturing company notices that when its cumulative production doubles, it observes a 10% decrease in the time it takes to produce one unit of product. Based on a cumulative average-time learning model, this decrease in unit production time implies a learning curve of

- A. 5%
- B. 10%
- C. 90%
- D. 110%

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 3: Expected Value

Fact Pattern: The probabilities shown in the table below represent the estimate of sales for a new product.

<u>Sales (Units)</u>	<u>Probability</u>
0-200	15%
201-400	45%
401-600	25%
601-800	15%

Question: 73 What is the probability of selling between 201 and 600 units of the product?

- A. 0%
- B. 11.25%
- C. 70%
- D. 25%

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 3: Expected Value

Fact Pattern: The probabilities shown in the table below represent the estimate of sales for a new product.

<u>Sales (Units)</u>	<u>Probability</u>
0-200	15%
201-400	45%
401-600	25%
601-800	15%

Question: 74 What is the best estimate of the expected sales of the new product?

- A. 480
- B. 380
- C. 400
- D. 800

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 3: Expected Value

Question: 75 In decision making under conditions of uncertainty, expected value refers to the

- A. Likely outcome of a proposed action.
- B. Present value of alternative actions.
- C. Probability of a given outcome from a proposed action.
- D. Weighted average of probable outcomes of an action.

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 3: Expected Value

Fact Pattern: A beverage stand can sell either soft drinks or coffee on any given day. If the stand sells soft drinks and the weather is hot, it will make \$2,500; if the weather is cold, the profit will be \$1,000. If the stand sells coffee and the weather is hot, it will make \$1,900; if the weather is cold, the profit will be \$2,000. The probability of cold weather on a given day at this time is 60%.

Question: 76 If the probability of hot weather, given a hot weather forecast, is 50%, how much would the vendor be willing to pay for the forecast?

- A. \$600
- B. \$300
- C. \$1,000
- D. \$500

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 3: Expected Value

Fact Pattern: Butler and Burnside are projecting market conditions for the upcoming month. They have prepared the following payoff table:

Supply in Units	Demand in Units			
	0	2	4	6
	Probability of Demand			
	0.1	0.3	0.4	0.2
0	\$ 0	\$ 0	\$ 0	\$ 0
2	(80)	40	40	40
4	(160)	(40)	80	80
6	(240)	(120)	0	120

Question: 77 Butler and Burnside's expected profit when supply equals 4 units is

- A. \$(40)
- B. \$80
- C. \$20
- D. \$120

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 3: Expected Value

Fact Pattern: Butler and Burnside are projecting market conditions for the upcoming month. They have prepared the following payoff table:

Supply in Units	Demand in Units			
	0	2	4	6
	Probability of Demand			
	0.1	0.3	0.4	0.2
0	\$ 0	\$ 0	\$ 0	\$ 0
2	(80)	40	40	40
4	(160)	(40)	80	80
6	(240)	(120)	0	120

Question: 78 Butler and Burnside's expected profit with perfect information is

- A. \$28
- B. \$20
- C. \$(36)
- D. \$68

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 3: Expected Value

Fact Pattern: Butler and Burnside are projecting market conditions for the upcoming month. They have prepared the following payoff table:

Supply in Units	Demand in Units			
	0	2	4	6
	Probability of Demand			
	0.1	0.3	0.4	0.2
0	\$ 0	\$ 0	\$ 0	\$ 0
2	(80)	40	40	40
4	(160)	(40)	80	80
6	(240)	(120)	0	120

Question: 79 The price Butler and Burnside are willing to pay for perfect information is

- A. \$68
- B. \$40
- C. \$48
- D. \$104

Question: 80

A company's managers are attempting to value a piece of land they own. One potential occurrence is that the old road bordering the land gets paved. Another possibility is that the road does not get paved. A third outcome is that the road might be destroyed and completely replaced by a new road. Based on the following future states of nature, their probabilities, and subsequent values of the land, what is the expected value of the land?

<u>Future States of Nature (SN)</u>	<u>Probability</u>
SN 1: Current road gets paved	.5
SN 2: Road does not get paved	.4
SN 3: Current road destroyed and replaced with new road	.1

Estimates of land value under each possible future state of nature:

Value if SN 1: \$200,000

Value if SN 2: \$100,000

Value if SN 3: \$550,000

A. \$133,333

B. \$195,000

C. \$225,000

D. \$283,333

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 3: Expected Value

Question: 81 Under favorable weather conditions, the management of a farm expects its raspberry crop to have a \$120,000 market value. An unprotected crop subject to frost has an expected market value of \$80,000. If the farm protects the raspberries against frost, the market value of the crop is still expected to be \$120,000 under frost-free conditions and \$180,000 if a frost occurs. What must be the probability of a frost for the farm to be indifferent to spending \$20,000 for tents to provide frost protection?

- A. .167
- B. .200
- C. .250
- D. .333

Question: 82 During the past few years, a company has experienced the following average number of power outages:

<u>Number per Month</u>	<u>Number of Months</u>
0	3
1	2
2	4
3	3
	<u>12</u>

Each power outage results in out-of-pocket costs of \$800. For \$1,000 per month, the company can lease a generator to provide power during outages. If the company leases a generator in the coming year, the estimated savings (or additional expense) for the year will be

- A. \$(15,200)
- B. \$(1,267)
- C. \$3,200
- D. \$7,200

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 3: Expected Value

Fact Pattern: The College Honor Society sells hot pretzels at the home football games. The pretzels are sold for \$1.00 each, and the cost per pretzel is \$.30. Any unsold pretzels are discarded because they will be stale before the next home game.

The frequency distribution of the demand for pretzels per game is presented as follows:

<u>Unit Sales Volume</u>	<u>Probability</u>
2,000 pretzels	.10
3,000 pretzels	.15
4,000 pretzels	.20
5,000 pretzels	.35
6,000 pretzels	.20

Question: 83 The estimated demand for pretzels at the next home football game using an expected value approach is

- A. 4,000 pretzels.
- B. 4,400 pretzels.
- C. 5,000 pretzels.
- D. Some amount other than those given.

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 3: Expected Value

Fact Pattern: The College Honor Society sells hot pretzels at the home football games. The pretzels are sold for \$1.00 each, and the cost per pretzel is \$.30. Any unsold pretzels are discarded because they will be stale before the next home game.

The frequency distribution of the demand for pretzels per game is presented as follows:

<u>Unit Sales Volume</u>	<u>Probability</u>
2,000 pretzels	.10
3,000 pretzels	.15
4,000 pretzels	.20
5,000 pretzels	.35
6,000 pretzels	.20

Question: 84 The estimated demand for pretzels at the next home football game using a deterministic approach based on the **most** likely outcome is

- A. 4,000 pretzels.
- B. 4,400 pretzels.
- C. 5,000 pretzels.
- D. 6,000 pretzels.

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 3: Expected Value

Fact Pattern: The College Honor Society sells hot pretzels at the home football games. The pretzels are sold for \$1.00 each, and the cost per pretzel is \$.30. Any unsold pretzels are discarded because they will be stale before the next home game.

The frequency distribution of the demand for pretzels per game is presented as follows:

<u>Unit Sales Volume</u>	<u>Probability</u>
2,000 pretzels	.10
3,000 pretzels	.15
4,000 pretzels	.20
5,000 pretzels	.35
6,000 pretzels	.20

Question: 85 The conditional profit per game of having 4,000 pretzels available but only selling 3,000 pretzels is

- A. \$1,800
- B. \$2,100
- C. \$2,800
- D. Some amount other than those given.

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 3: Expected Value

Fact Pattern: The College Honor Society sells hot pretzels at the home football games. The pretzels are sold for \$1.00 each, and the cost per pretzel is \$.30. Any unsold pretzels are discarded because they will be stale before the next home game.

The frequency distribution of the demand for pretzels per game is presented as follows:

<u>Unit Sales Volume</u>	<u>Probability</u>
2,000 pretzels	.10
3,000 pretzels	.15
4,000 pretzels	.20
5,000 pretzels	.35
6,000 pretzels	.20

Question: 86 The conditional profit per game of having 4,000 pretzels available and selling all 4,000 pretzels is

- A. \$1,200
- B. \$2,100
- C. \$2,800
- D. \$800

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 3: Expected Value

Question: 87 A company is in the process of preparing its budget. As part of the process, the company has prepared sales estimates and estimated the probability associated with each sales estimate. Which one of the following techniques should be used by the company to determine sales for budgeting purposes?

- A. Linear programming.
- B. Minimax regret criteria.
- C. Expected value analysis.
- D. Monte Carlo simulation.

Question: 88 The expected monetary value of an event

- A. Is equal to the conditional value or profit of the event.
- B. Is equal to the payoff of the event times the probability the event will occur.
- C. Is the profit forgone by not choosing the best alternative.
- D. Is the absolute profit from a particular event.

Question: 89 Expected value in decision analysis is

- A. A standard deviation using the probabilities as weights.
- B. An arithmetic mean using the probabilities as weights.
- C. The square root of the squared deviations.
- D. A measure of the difference between the best possible outcome and the outcome of the original decision.

Question: 90 The following table contains the profit outcomes for each state of nature and decision combination for a firm:

	States of Nature		
	S1	S2	S3
Decision 1	\$ 24	\$14	\$ (6)
Decision 2	\$ 20	\$10	\$ 5
Decision 3	\$(20)	\$ 8	\$15
Probabilities	0.10	0.50	0.40

The expected value of perfect information for this firm in this case is

- A. \$6.40
- B. \$8.40
- C. \$9.00
- D. \$8.60

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 3: Expected Value

Fact Pattern: A beverage stand can sell either soft drinks or coffee on any given day. If the stand sells soft drinks and the weather is hot, it will make \$2,500; if the weather is cold, the profit will be \$1,000. If the stand sells coffee and the weather is hot, it will make \$1,900; if the weather is cold, the profit will be \$2,000. The probability of cold weather on a given day at this time is 60%.

Question: 91 The expected payoff for selling coffee is

- A. \$1,360
- B. \$2,200
- C. \$3,900
- D. \$1,960

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 3: Expected Value

Fact Pattern: A beverage stand can sell either soft drinks or coffee on any given day. If the stand sells soft drinks and the weather is hot, it will make \$2,500; if the weather is cold, the profit will be \$1,000. If the stand sells coffee and the weather is hot, it will make \$1,900; if the weather is cold, the profit will be \$2,000. The probability of cold weather on a given day at this time is 60%.

Question: 92 The expected payoff if the vendor has perfect information is

- A. \$3,900
- B. \$2,200
- C. \$1,360
- D. \$1,960

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 3: Expected Value

Question: 93 A distributor of video discs is developing its budgeted cost of goods sold for next year. The distributor has developed the following range of sales estimates and associated probabilities for the year:

<u>Sales Estimate</u>	<u>Probability</u>
\$ 60,000	25%
85,000	40
100,000	35

The distributor's cost of goods sold averages 80% of sales. What is the expected value of the distributor's budgeted cost of goods sold?

- A. \$85,000
- B. \$84,000
- C. \$68,000
- D. \$67,200

Question: 94 The expected monetary value of an act is the

- A. Sum of the conditional profit (loss) for each event.
- B. Sum of the conditional profit (loss) for each event times the probability of each event's occurrence.
- C. Conditional profit (loss) for the best event times the probability of each event's occurrence.
- D. Revenue minus the costs for the act.

Question: 95 The expected value of perfect information is the

- A. Same as the expected profit under certainty.
- B. Sum of the conditional profit (loss) for the best event of each act times the probability of each event occurring.
- C. Difference between the expected profit under certainty and the expected opportunity loss.
- D. Difference between the expected profit under certainty and the expected monetary value of the best act under uncertainty.

Question: 95 The expected value of perfect information is the

- A. Same as the expected profit under certainty.
- B. Sum of the conditional profit (loss) for the best event of each act times the probability of each event occurring.
- C. Difference between the expected profit under certainty and the expected opportunity loss.
- D. Difference between the expected profit under certainty and the expected monetary value of the best act under uncertainty.

Question: 96 In decision theory, those uncontrollable future events that can affect the outcome of a decision are

- A. Payoffs.
- B. States of nature.
- C. Probabilities.
- D. Nodes.

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 3: Expected Value

Fact Pattern: The Booster Club at Blair College sells hot dogs at home basketball games. The group has a frequency distribution of the demand for hot dogs per game and plans to apply the expected value decision rule to determine the number of hot dogs to stock.

Question: 97 The Booster Club should select the demand level that

- A. Is closest to the expected demand.
- B. Has the greatest probability of occurring.
- C. Has the greatest expected opportunity cost.
- D. Has the greatest expected monetary value.

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 3: Expected Value

Fact Pattern: A company is considering three alternative machines to produce a new product. The cost structures (unit variable costs plus avoidable fixed costs) for the three machines are shown as follows. The selling price is unaffected by the machine used.

Single purpose machine	$\$.60x + \$20,000$
Semiautomatic machine	$\$.40x + \$50,000$
Automatic machine	$\$.20x + \$120,000$

The demand for units of the new product is described by the following probability distribution.

Demand	Probability
200,000	0.4
300,000	0.3
400,000	0.2
500,000	0.1

Question: 98 Ignoring the time value of money, the expected cost of using the semiautomatic machine is

- A. \$170,000
- B. \$130,000
- C. \$210,000
- D. \$250,000

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 3: Expected Value

Fact Pattern: A company is considering three alternative machines to produce a new product. The cost structures (unit variable costs plus avoidable fixed costs) for the three machines are shown as follows. The selling price is unaffected by the machine used.

Single purpose machine	$\$.60x + \$20,000$
Semiautomatic machine	$\$.40x + \$50,000$
Automatic machine	$\$.20x + \$120,000$

The demand for units of the new product is described by the following probability distribution.

Demand	Probability
200,000	0.4
300,000	0.3
400,000	0.2
500,000	0.1

Question: 99 Using the expected value criterion,

- A. The single purpose machine should be used because of the low expected demand.
- B. The automatic machine should be used because of the high expected demand.
- C. The semiautomatic machine should be used because it has the lowest expected cost.
- D. The automatic machine has the lowest expected cost.

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 3: Expected Value

Fact Pattern: Stan Berry is considering selling peanuts at the Keefer High School football games. The peanuts would cost \$.50 per bag and could be sold for \$1.50 per bag. No other costs would be incurred to sell the peanuts. All unsold bags can be returned to the supplier for \$.30 each. Berry estimated the demand for peanuts at each football game and constructed the payoff table that follows.

Demand (Bags)	Probability of Demand	Action (Bags to Stock)			
		20	30	40	50
20	.2	\$20	\$18	\$16	\$14
30	.4	\$20	\$30	\$28	\$26
40	.3	\$20	\$30	\$40	\$38
50	.1	\$20	\$30	\$40	\$50

Question: 100 The optimum number of bags of peanuts for Stan Berry to stock is

- A. 20
- B. 30
- C. 40
- D. 50

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 3: Expected Value

Fact Pattern: Stan Berry is considering selling peanuts at the Keefer High School football games. The peanuts would cost \$.50 per bag and could be sold for \$1.50 per bag. No other costs would be incurred to sell the peanuts. All unsold bags can be returned to the supplier for \$.30 each. Berry estimated the demand for peanuts at each football game and constructed the payoff table that follows.

Demand (Bags)	Probability of Demand	Action (Bags to Stock)			
		20	30	40	50
20	.2	\$20	\$18	\$16	\$14
30	.4	\$20	\$30	\$28	\$26
40	.3	\$20	\$30	\$40	\$38
50	.1	\$20	\$30	\$40	\$50

Question: 101 The maximum that Stan Berry should pay for perfect information so that he could always stock the correct number of bags of peanuts is

- A. \$.80
- B. \$2.60
- C. \$10.40
- D. \$30.00

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 3: Expected Value

Question: 102 An entity sells sweatshirts and is preparing for a World Cup Soccer match. The cost per sweatshirt varies with the quantity purchased as follows:

Quantity	Unit Cost
4,000	\$14.00
5,000	13.50
6,000	13.00
7,000	12.50

The entity must purchase the sweatshirts one month before the game and has analyzed the market and estimated sales levels as follows:

Unit sales	4,000	5,000	6,000	7,000
Probability	15%	20%	35%	30%

The estimated selling price is \$25 for sales made before and during game day. Any sweatshirts remaining after game day can be sold at wholesale to a local discount store for \$10.

The expected profit if the entity purchased 6,000 shirts is

- A. \$64,500
- B. \$66,000
- C. \$69,000
- D. \$72,000

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 3: Expected Value

Fact Pattern: A computer store sells four computer models designated as P104, X104, A104, and S104. The store manager has made random number assignments to represent customer choices based on past sales data. The assignments are shown below.

<u>Model</u>	<u>Random Numbers</u>
P104	0-1
X104	2-6
A104	7-8
S104	9

Question: 103 The probability that a customer will select model P104 is

- A. 10%
- B. 20%
- C. 50%
- D. Some percentage other than those given.

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 3: Expected Value

Fact Pattern: A computer store sells four computer models designated as P104, X104, A104, and S104. The store manager has made random number assignments to represent customer choices based on past sales data. The assignments are shown below.

Model	Random Numbers
P104	0-1
X104	2-6
A104	7-8
S104	9

Question: 104 In running a simulation of the computer demand, the following numbers are drawn in sequence: 2, 8, and 6. The simulation indicates that the third customer will purchase.

- A. Model P104.
- B. Model X104.
- C. Model A104.
- D. Model S104.

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 3: Expected Value

Question: 105 A company is simulating the actions of a government agency in which 50% of the time a recall of a product is required, 40% of the time only notification of the buyer about a potential defect is required, and 10% of the time no action on its part is required. Random numbers of 1 to 100 are being used. An appropriate assignment of random numbers for the recall category would be

- A. 1-40
- B. 40-90
- C. 61-100
- D. 11-60

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 3: Expected Value

Question: 106 A software company has developed a new software package. The sales manager has prepared the following probability distribution describing the relative likelihood of monthly sales levels and relative income (loss) for the company's new software package.

Monthly Sales		
In Units	Probability	Income(Loss)
10,000	.2	\$(4,000)
20,000	.3	10,000
30,000	.3	30,000
40,000	.2	60,000

If the software company decides to market its new software package, the expected value of additional monthly income will be

- A. \$23,200
- B. \$24,000
- C. \$24,800
- D. \$25,000

Question: 107 According to recent focus sessions, a corporation has a "can't miss" consumer product on its hands. Sales forecasts indicate either excellent or good results, with the sales manager assigning a probability of .6 to a good results outcome. The company is now studying various sales compensation plans for the product and has determined the following contribution margin data:

	<u>Contribution Margin</u>
If sales are excellent and Plan 1 is adopted	\$300,000
Plan 2 is adopted	370,000
If sales are good and Plan 1 is adopted	240,000
Plan 2 is adopted	180,000

On the basis of this information, which of the following statements is correct?

- A. Plan 2 should be adopted because it is \$10,000 more attractive than Plan 1.
- B. Plan 1 should be adopted because it is \$8,000 more attractive than Plan 2.
- C. Plan 1 should be adopted because of the sales manager's higher confidence in good results.
- D. Either Plan should be adopted, the decision being dependent on the probability of excellent sales results.

Question: 108 An entity manufactures industrial machinery and requires 100,000 switches per year in its assembly process. When switches are received from a vendor they are installed in the specific machine and tested. If the switches fail, they are scrapped and the associated labor cost of \$25 is considered lost productivity. The entity purchases "off the shelf" switches as opposed to custom-made switches and experiences quality problems with some vendors' products. A decision must be made as to which vendor to buy from during the next year based on the following information.

Vendor	Price per Switch	Percentage Expected to Pass the Test
P	\$35	90%
Q	37	94%
R	39	97%
S	40	99%

Which vendor should the controller recommend to management?

- A. Vendor P.
- B. Vendor Q.
- C. Vendor R.
- D. Vendor S.

Question: 109 A controller has decided to use a decision model to cope with uncertainty. With a particular proposal, currently under consideration, the controller has two possible actions, invest or not invest in a joint venture with an international firm. The controller has determined the following:

Action: Invest in the Joint Venture

Events and Probabilities:

Probability of success	= 60%
Cost of investment	= \$9.5 million
Cash flow if investment is successful	= \$15.0 million
Cash flow if investment is unsuccessful	= \$2.0 million
Additional costs to be paid	= \$0
Costs incurred up to this point	= \$650,000

Action: Do Not Invest in the Joint Venture

Events:

Costs incurred up to this point	= \$650,000
Additional costs to be paid	= \$100,000

Which one of the following alternatives correctly reflects the respective expected values of investing versus not investing?

- A. \$300,000 and \$(750,000).
- B. \$(350,000) and \$(100,000).
- C. \$300,000 and \$(100,000).
- D. \$(350,000) and \$(750,000).

Question: 110 A company has three possible investment opportunities. The controller calculated the payoffs and probabilities as follows:

Payoffs	Probabilities		
	Investment A	Investment B	Investment C
\$(20,000)	.3	.2	.3
(10,000)	.1	.2	.1
30,000	.3	.2	.2
70,000	.2	.2	.3
100,000	.1	.2	.1

The cost of investments A, B, and C are the same. Using the expected-value criterion, which one of the following rankings of these investments, from highest payoff to lowest payoff, is correct?

- A. A, B, C.
- B. B, A, C.
- C. C, A, B.
- D. B, C, A.

Question: 111 The sales manager has suggested that an expanded advertising campaign costing \$40,000 would increase the sales and profits of the company. He has developed the following probability distribution for the effect of the advertising campaign on company sales:

Sales Increase (Units)	Probability
15,000	.10
30,000	.35
45,000	.10
60,000	.25
75,000	.20

The company sells the dolls at \$5.20 each. The cost of each doll is \$3.20. The expected incremental profit, if the advertising campaign is adopted, is

- A. \$6,500
- B. \$46,500
- C. \$53,000
- D. \$93,000

Question: 112 Stock X has the following probability distribution of expected future returns:

<u>Probability</u>	<u>Expected Return</u>
.1	-20%
.2	5%
.4	15%
.2	20%
.1	30%

The expected rate of return on Stock X is

- A. 10%
- B. 12%
- C. 16%
- D. 19%

Question: 113 Which one of the following four probability distributions provides the highest expected monetary value?

Alternative #1		Alternative #2	
Prob	Cash Inflows	Prob	Cash Inflows
10%	\$ 50,000	10%	\$ 50,000
20%	75,000	20%	75,000
40%	100,000	45%	100,000
30%	150,000	25%	150,000

Alternative #3		Alternative #4	
Prob	Cash Inflows	Prob	Cash Inflows
10%	\$ 50,000	10%	\$150,000
20%	75,000	20%	100,000
40%	100,000	40%	75,000
30%	125,000	30%	50,000

- A. Alternative #1.
- B. Alternative #2.
- C. Alternative #3.
- D. Alternative #4.

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 3: Expected Value

Question: 114 A company is preparing its budget and, taking into consideration the recent pace of economic recovery, has developed several sales forecasts and the estimated probability associated with each sales forecast. To determine the sales forecast to be used for budgeting purposes, which one of the following techniques should be used?

- A. Expected value analysis.
- B. Continuous probability simulation.
- C. Exponential distribution analysis.
- D. Sensitivity analysis.

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 3: Expected Value

Fact Pattern: Gleason Co. has two products, a frozen dessert and ready-to-bake breakfast rolls, ready for introduction. However, plant capacity is limited, and only one product can be introduced at present. Therefore, Gleason has conducted a market study at a cost of \$26,000, to determine which product will be more profitable. The results of the study follow.

Sales of Desserts at \$1.80/unit		Sales of Rolls at \$1.20/unit	
Volume	Probability	Volume	Probability
250,000	.30	200,000	.20
300,000	.40	250,000	.50
350,000	.20	300,000	.20
400,000	.10	350,000	.10

The costs associated with the two products have been estimated by Gleason's cost accounting department and are as follows:

	Dessert	Rolls
Ingredients per unit	\$.40	\$.25
Direct labor per unit	.35	.30
Variable overhead per unit	.40	.20
Production tooling*	48,000	25,000
Advertising	30,000	20,000

*Gleason treats production tooling as a current operating expense rather than capitalizing it as a fixed asset.

Question: 115 According to Gleason's market study, the expected value of the sales volume of the breakfast rolls is

- A. 125,000 units.
- B. 260,000 units.
- C. 275,000 units.
- D. Some amount other than those given.

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 3: Expected Value

Fact Pattern: Gleason Co. has two products, a frozen dessert and ready-to-bake breakfast rolls, ready for introduction. However, plant capacity is limited, and only one product can be introduced at present. Therefore, Gleason has conducted a market study at a cost of \$26,000, to determine which product will be more profitable. The results of the study follow.

Sales of Desserts at \$1.80/unit		Sales of Rolls at \$1.20/unit	
Volume	Probability	Volume	Probability
250,000	.30	200,000	.20
300,000	.40	250,000	.50
350,000	.20	300,000	.20
400,000	.10	350,000	.10

The costs associated with the two products have been estimated by Gleason's cost accounting department and are as follows:

	Dessert	Rolls
Ingredients per unit	\$.40	\$.25
Direct labor per unit	.35	.30
Variable overhead per unit	.40	.20
Production tooling*	48,000	25,000
Advertising	30,000	20,000

*Gleason treats production tooling as a current operating expense rather than capitalizing it as a fixed asset.

Question: 116 Applying a deterministic approach, Gleason's revenue from sales of frozen desserts would be

- A. \$550,000
- B. \$540,000
- C. \$216,000
- D. Some amount other than those given.

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 3: Expected Value

Fact Pattern: Gleason Co. has two products, a frozen dessert and ready-to-bake breakfast rolls, ready for introduction. However, plant capacity is limited, and only one product can be introduced at present. Therefore, Gleason has conducted a market study at a cost of \$26,000, to determine which product will be more profitable. The results of the study follow.

Sales of Desserts at \$1.80/unit		Sales of Rolls at \$1.20/unit	
Volume	Probability	Volume	Probability
250,000	.30	200,000	.20
300,000	.40	250,000	.50
350,000	.20	300,000	.20
400,000	.10	350,000	.10

The costs associated with the two products have been estimated by Gleason's cost accounting department and are as follows:

	Dessert	Rolls
Ingredients per unit	\$.40	\$.25
Direct labor per unit	.35	.30
Variable overhead per unit	.40	.20
Production tooling*	48,000	25,000
Advertising	30,000	20,000

*Gleason treats production tooling as a current operating expense rather than capitalizing it as a fixed asset.

Question: 117 The expected value of Gleason's operating profit directly traceable to the sale of frozen desserts is

- A. \$198,250
- B. \$150,250
- C. \$120,250
- D. Some amount other than those given.

Question: 118 Ryotel is conducting market research to determine whether or not to launch a new product. Management believes there is a 60% probability the research will yield favorable results and a 40% probability the results will be unfavorable. If the results are favorable, there is a 70% probability the product will be successful; if the results are unfavorable, the probability the product will be unsuccessful is 75%. If the product is successful, Ryotel anticipates annual profits of \$10,000,000, but if the product is unsuccessful, Ryotel will lose \$4,000,000 each year. The expected value of the new product's annual profit is

- A. \$3,000,000
- B. \$3,280,000
- C. \$4,000,000
- D. \$5,300,000

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 3: Expected Value

Question: 119 Last year, a corporation's sales totaled \$200 million. In the current year, the corporation believes there is a 10% chance sales will decrease to \$180 million due to the loss of a major customer. The corporation also estimates there is a 40% probability sales will remain constant, a 30% chance sales will increase to \$240 million, and a 20% probability sales will increase to \$250 million. The expected value of the corporation's sales in millions for the current year is

- A. \$160
- B. \$184
- C. \$202
- D. \$220

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 3: Expected Value

Question: 120 An entity sells its product for \$100 per unit while incurring variable operating costs of \$60 per unit and \$25,000,000 of fixed operating costs. The management team believes there is a 20% probability sales for the upcoming period will be 600,000 units, a 50% probability sales will be 800,000 units, and a 30% probability sales will be 1,000,000 units. The expected value of the entity's operating profit for the upcoming period is

- A. \$32,800,000
- B. \$8,200,000
- C. \$7,800,000
- D. \$7,000,000

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 3: Expected Value

Question: 121 A veterinary clinic schedules weekend staff based on the number of animals being boarded. The clinic has a total of four staff members available to work on weekends. Based on state regulations, the clinic is required to have one staff member on site for up to 10 animals. Two staff members are required for 11-23 animals, three staff for 24-36 animals and all four staff members must work if there are 37-45 animals being boarded. The clinic has experienced the following average number of animals in the past 12 weekends.

<u>Average Number of Animals</u>	<u>Number of Weekends</u>
12	1
20	4
25	3
35	2
40	2

Using expected value analysis, how many staff members should the clinic schedule for each weekend during the upcoming month?

- A. 1
- B. 2
- C. 3
- D. 4

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 3: Expected Value

Question: 122 An entrepreneur has four booth rental options at the county fair where he plans to sell his new product for \$37.50 per unit with a cost of \$12.50. The booth rental options are shown below.

Option 1: \$1,000 fixed fee

Option 2: \$750 fixed fee + 5% of all revenues generated at the fair

Option 3: 20% of all revenues generated at the fair

Option 4: \$200 fixed fee + 16% of all revenues generated at the fair

Assuming there is a 40% probability that 70 units will be sold and a 60% probability that 40 units will be sold, which option maximizes income?

- A. Option 1.
- B. Option 2.
- C. Option 3.
- D. Option 4.

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 3: Expected Value

Question: 123 A manager is reviewing a potential investment, which has significant uncertainty related to its ultimate financial outcome. The manager has estimated the following probabilities for the various levels of net cash flows that may result from the investment.

<u>Likelihood of Outcome</u>	<u>Net Cash Flows</u>
10%	\$(300,000)
20%	0
50%	100,000
20%	600,000

What is the expected value of net cash flows that the manager should use in evaluating the investment?

- A. \$100,000
- B. \$137,000
- C. \$140,000
- D. \$400,000

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 3: Expected Value

Question: 124 A quantitative technique useful in projecting a firm's sales and profits is

- A. Probability distribution theory.
- B. Gantt charting.
- C. Learning curves.
- D. Queuing theory.

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 3: Expected Value

Question: 125 A toy company is in the process of forecasting sales for a new toy. The company has the following estimates of unit sales with a corresponding probability distribution:

<u>Unit Sales</u>	<u>Probability</u>
550,000	20%
475,000	35%
350,000	45%

How many units should the company forecast for sales of the new toys?

- A. 350,000
- B. 433,750
- C. 458,288
- D. 1,375,000

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 3: Expected Value

Question: 126 A clothing company is evaluating two possible locations for a new retail store. The company's research indicates that Location A has a 45% probability of generating \$400,000 in cash flow and a 55% probability of generating \$325,000 in cash flow. Location B has a 25% probability of generating \$600,000 in cash flow and a 75% probability of generating \$250,000 in cash flow. Based on the expected value for each location, the company should choose Location

- A. A because its expected value is \$21,250 higher than Location B.
- B. A because its expected value is \$75,000 higher than Location B.
- C. B because its expected value is \$125,000 higher than Location A.
- D. B because its expected value is \$146,250 higher than Location A.

Question: 127 An accountant estimated the repair costs for the company's plant facilities for next year's operating budget. The accountant has determined the following probability distribution after analyzing historical repair costs:

<u>Probability</u>	<u>Repair Costs</u>
15%	\$2,000,000
45%	2,500,000
30%	3,500,000
10%	5,000,000

What is the estimated repair cost that the accountant should project for next year's operating budget?

- A. \$1,850,000
- B. \$1,925,000
- C. \$2,975,000
- D. \$3,250,000

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 4: Sensitivity Analysis

Question: 128 A widely used approach that managers use to recognize uncertainty about individual items and to obtain an immediate financial estimate of the consequences of possible prediction errors is

- A. Expected value analysis.
- B. Learning curve analysis.
- C. Sensitivity analysis.
- D. Regression analysis.

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 4: Sensitivity Analysis

Question: 129 Through the use of decision models, managers thoroughly analyze many alternatives and decide on the best alternative for the company. Often, the actual results achieved from a particular decision are not what was expected when the decision was made. In addition, an alternative that was not selected would have actually been the best decision for the company. The appropriate technique to analyze the alternatives by using expected inputs and altering them before a decision is made is

- A. Expected value analysis.
- B. Linear programming.
- C. Program Evaluation Review Technique (PERT).
- D. Sensitivity analysis.

Question: 130 The process of evaluating the effect of changes in variables such as sales price or wage rates on the optimum solution in a linear programming application is called

- A. Iterative analysis.
- B. Regression analysis.
- C. Sensitivity analysis.
- D. Matrix analysis.

Question: 131 An analyst has developed an estimate of the earnings per share for her firm for the next year using the following parameters.

Sales	\$20 million
Cost of goods sold	70% of sales
General & administrative expenses	\$300,000
Selling expense	\$100,000 plus 10% of sales
Debt outstanding	\$5 million at 8% interest rate
Effective tax rate	35%
Common shares outstanding	2 million

She is now interested in the sensitivity of earnings per share to sales forecast changes. A 10% sales increase would increase earnings per share by

- A. 7.0 cents per share.
- B. 10.4 cents per share.
- C. 13.0 cents per share.
- D. 20.0 cents per share.

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 4: Sensitivity Analysis

Question: 132 A company operates several retail stores. To support the company's long-term goals, operating income should be at least 10% of sales. The company's abbreviated pro forma income statement for next year is shown below.

Revenues	\$7,500,000
Cost of goods sold	3,750,000
Operating fixed costs	<u>3,125,000</u>
Operating income	<u>\$ 625,000</u>

The **best** action for the company to take in order to meet its income goal is to

- A. Increase the advertising budget by \$25,000, which would increase sales units by 5%.
- B. Raise the selling price by 2%, which would reduce sales units by 2% but save \$50,000 in operating costs.
- C. Require all managers to reduce their budgeted operating fixed costs by 3%.
- D. Wait until the end of next year's first quarter to re-evaluate its situation.

Question: 133 Which of the following steps in the strategic management process should be completed first?

- A. Translate objectives into goals.
- B. Determine actions to achieve goals.
- C. Develop performance measures.
- D. Create a mission statement.

Question: 134 A firm's statement of broad objectives or mission statement should accomplish all of the following **except**

- A. Outlining strategies for technological development, market expansion, and product differentiation.
- B. Defining the purpose of the company.
- C. Providing an overall guide to those in high-level, decision-making positions.
- D. Stating the moral and ethical principles that guide the actions of the firm.

Question: 135 Intensity of rivalry among existing firms in an industry increases when

- I. Products are relatively undifferentiated
- II. Consumer switching costs are low

- A. I only.
- B. II only.
- C. Both I and II.
- D. Neither I nor II.

Question: 136 Structural considerations affecting the threat of substitutes include all of the following **except**

- A. Relative prices.
- B. Brand identity.
- C. Cost of switching to substitutes.
- D. Customers' inclination to use a substitute.

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Question: 137 A corporation is performing research to determine the feasibility of entering the truck rental industry. The decision to enter the market is **most** likely to be deterred if

- A. The fixed costs are high in relation to variable costs in the truck rental industry.
- B. Buyers view the product as differentiated.
- C. The market is dominated by a small consortium of buyers.
- D. Buying firms enjoy large profit margins on their end products.

Question: 138 Which industry factor does **not** contribute to competitive rivalry?

- A. Price-cutting, large advertising budgets, and frequent introduction of new products.
- B. A firm's growth must come from winning other firms' customers.
- C. High costs of customers switching suppliers.
- D. High fixed costs relative to variable costs.

Question: 139 Which condition does **not** increase the threat of new competitor entry into the industry?

- A. Strong brand identity.
- B. Existing firms do not enjoy the cost advantages of vertical integration.
- C. Few proprietary product differences.
- D. Low capital requirements.

Question: 140 The concurrent action of basic competitive forces as defined by Porter's model determines the

- A. Long-term profitability and the competitive intensity of the industry.
- B. Entrance barriers that potential players must face to get into the industry.
- C. Rivalry inside the industry.
- D. Nonvalue-adding activities that should be eliminated.

Question: 141 Which factor **most** likely encourages entry into an existing market?

- A. Governmental subsidies for new investors.
- B. High product differentiation, principally produced by trademarks.
- C. Knowledge of the industry, with high investments in development.
- D. Low fixed exit costs.

Question: 142 Which of the following is a favorable condition for a firm competing in a profitable, expanding industry?

- A. The firm does not have a strong customer base.
- B. A few suppliers who can restrict supply.
- C. Competitors find it difficult to acquire the firm's customers.
- D. The firm has high costs relative to other firms in the industry.

Question: 143 Michael E. Porter's competitive strategies model includes an analysis of the competitive forces that determine the attractiveness of an industry. These forces include

- I. The stage of the industry life cycle
- II. Threats of, and barriers to, entry
- III. Threat of substitutes
- IV. The threat of suppliers' bargaining power

- A. I and II only.
- B. I and III only.
- C. II, III, and IV only.
- D. I, II, III, and IV.

Question: 144 Which factor increases the threat of entry into an industry?

- A. Economies of scale are significant.
- B. Capital requirements are high.
- C. An industry leader may retaliate against a new entrant.
- D. Exit barriers are low.

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Question: 145 A manufacturing company produces plastic utensils for a particular segment at the lowest possible cost. The company is pursuing a cost

- A. Leadership strategy.
- B. Focus strategy.
- C. Differentiation strategy.
- D. Containment strategy.

Question: 146 What operations strategy is **most** likely to be adopted when the product sold by an organization is a commodity and the market is very large?

- A. Flexibility strategy.
- B. Quality strategy.
- C. Service strategy.
- D. Cost strategy.

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Question: 147 During the growth stage of a product's life cycle,

- A. The quality of products is poor.
- B. New product models and features are introduced.
- C. There is little difference between competing products.
- D. The quality of the products becomes more variable and products are less differentiated.

Question: 148 In a product's life cycle, the first symptom of the decline stage is a decline in the

- A. Firm's inventory levels.
- B. Product's sales.
- C. Product's production cost.
- D. Product's prices.

Question: 149 A company is trying to decide which competitive strategy it should try to implement. Since the company has recently started producing Halloween products and selling them in its Halloween stores a few months prior, it is trying to focus on low costs. The company believes that this will give it a competitive advantage since much of the competition across the nation is selling more expensive Halloween products. Which competitive strategy should the company **most** likely try to implement?

- A. Cost leadership.
- B. Differentiation.
- C. Cost focus.
- D. Focused differentiation.

Question: 150 A bowling alley has identified three revenue streams with the following income statements.

		Equipment	
	Bowling	Rental	Food Sales
Revenues	\$9,000,000	\$300,000	\$1,200,000
Variable costs	1,100,000	150,000	1,150,000
Direct employee salaries	250,000	40,000	120,000
Common costs	6,400,000	35,000	365,000
Income (loss)	<u>\$1,250,000</u>	<u>\$ 75,000</u>	<u>\$ (435,000)</u>

The **most** important consideration in determining whether to discontinue its food sales is

- A. Employee morale.
- B. Its interrelationships with other products.
- C. The ability to increase food sales.
- D. The ease of implementing activity-based costing to better assign costs.

Question: 151 A strategic business unit (SBU) has a high relative market share (RMS) and a low market growth rate (MGR). According to the growth-share matrix for competitive analysis created by the Boston Consulting Group, such an SBU is considered a

- A. Star.
- B. Question mark.
- C. Cash cow.
- D. Dog.

Question: 152 In the Boston Consulting Group (BCG) growth-share matrix, which strategic business units are strong competitors in high growth markets but usually have modest net cash flow?

- A. Cash cows.
- B. Question marks.
- C. Dogs.
- D. Stars.

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Question: 152 In the Boston Consulting Group (BCG) growth-share matrix, which strategic business units are strong competitors in high growth markets but usually have modest net cash flow?

- A. Cash cows.
- B. Question marks.
- C. Dogs.
- D. Stars.

Question: 153 A strategic business unit (SBU) has a low relative market share (RMS) and a high market growth rate (MGR). According to the portfolio model for competitive analysis (the growth-share matrix) created by the Boston Consulting Group, the SBU is considered a

- A. Star.
- B. Question mark.
- C. Cash cow.
- D. Dog.

Question: 154 According to the growth-share matrix approach developed by the Boston Consulting Group, a harvest strategy is most likely to be used for SBUs that are

- A. Question marks that may become stars.
- B. Strong cash cows.
- C. Weak cash cows.
- D. Dogs that reduce the firm's profits.

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Question: 155 According to the Boston Consulting Group's portfolio model for competitive analysis, the strategy for a strong cash cow should be

- A. Harvest.
- B. Divest.
- C. Hold.
- D. Build.

Question: 156 A typical life cycle progression for a successful firm within the Boston Consulting Group's growth-share matrix is

- A. Star, question mark, cash cow, dog.
- B. Question mark, star, cash cow, dog.
- C. Star, cash cow, question mark, dog.
- D. Question mark, cash cow, star, dog.

Question: 157 A company has developed and implemented a wireless charging feature into one of their flashlights. No other competitor in the marketplace currently offers this feature. In a marketing research study, the vast majority of consumers indicated that they would pay a premium for this feature. Which one of the following is the **best** strategy to bring this product to the market?

- A. Porter's cost strategy.
- B. Porter's focus strategy.
- C. Porter's differentiation strategy.
- D. Porter's segmentation strategy.

Question: 158 Products identified in the BCG growth-share matrix as cash cows possess relatively

- A. High market share in a low growth market.
- B. Low market share in a high growth market.
- C. High market share in a high growth market.
- D. Low market share in a low growth market.

Question: 159 A company is the leading company in the premium bottled water industry. Its growth is mainly driven by the negative health publicity on carbonated soft drinks and other sweetened beverages. Extensive inventory and distribution infrastructure is needed to compete in this industry. Its main packaging materials can be sourced either locally or easily imported from overseas. With its 60% market share, the company is able to influence prices and competitive activity. The second biggest competitor holds 20% market share, while the remaining 20% is shared by many small companies. Supermarkets and other grocery retailers are the largest customer segment, accounting for approximately 45% of sales. The supermarkets and grocery retailers are driving volume growth and are undergoing consolidation into larger supermarket conglomerates. Using Porter's 5 Forces, which one of the following statements **best** reflects the industry environment?

- A. Low profitability but can increase due to increasing power of buyers.
- B. Low profitability due to low threat of substitutes and new entrants.
- C. High profitability but can decrease due to increasing power of buyers.
- D. High profitability due to high power of buyers and sellers.

Question: 160 Analyzing a company's technological capabilities, employee skills, and sales team performance will provide

- A. External factors that identify the company's strengths and threats.
- B. Internal factors that identify the company's strengths and opportunities.
- C. External factors that identify the company's strengths and weaknesses.
- D. Internal factors that identify the company's strengths and weaknesses.

Question: 161 Which one of the following describes what an organization wants to accomplish and leads to the formulation of long-term business objectives?

- A. Values.
- B. Strategy.
- C. Competency.
- D. Mission statement.

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 5: Strategic Management

Question: 162 What type of plan is formulated at the highest levels of management; takes the broadest view of the company and its environment; is the **least** quantifiable; and determines the future nature of the firm, its products, and its customers?

- A. Short-range plan.
- B. Long-range plan.
- C. Strategic plan.
- D. Future plan.

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 6: The Balanced Scorecard

Question: 163 The balanced scorecard provides an action plan for achieving competitive success by focusing management attention on critical success factors. Which one of the following is **not** one of the perspectives on the business into which critical success factors are commonly grouped in the balanced scorecard?

- A. Competitor business strategies.
- B. Financial performance.
- C. Internal business processes.
- D. Employee innovation and learning.

Question: 164 Using the balanced scorecard approach, an organization evaluates managerial performance based on

- A. A single ultimate measure of operating results, such as residual income.
- B. Multiple financial and nonfinancial measures.
- C. Multiple nonfinancial measures only.
- D. Multiple financial measures only.

Question: 165 On a balanced scorecard, which is more of an internal process measure than an external-based measure?

- A. Cycle time.
- B. Profitability.
- C. Customer satisfaction.
- D. Market share.

Question: 166 Consider the following categories of performance measures.

- I. Profitability measures.
- II. Customer-satisfaction measures.
- III. Efficiency, quality, and time measures.
- IV. Innovation measures.

A cruise line operates on a national scale in a very competitive marketplace. In view of this information, which measures should the company use in the evaluation of its managers?

- A. I only.
- B. I and II.
- C. II and III.
- D. I, II, III, and IV.

Question: 167 Which one of the following statements about a balanced scorecard is **incorrect**?

- A. It seeks to address the problems associated with traditional financial measures used to assess performance.
- B. The notion of value chain analysis plays a major role in the drawing up of a balanced scorecard.
- C. It relies on the perception of the users with regard to service provided.
- D. It is directly derived from the scientific management theories.

Question: 168 Two examples of the learning and innovation measures of a balanced scorecard are

- A. Employee promotion rate and number of environmental incidents.
- B. Employee training hours and product defect rates.
- C. Number of employee suggestions and finished products per day per employee.
- D. Employee turnover rate and number of internal process improvements.

Question: 169 Which one of the following statements **best** describes the definition of critical success factors?

- A. Financial measures that track a company's competitive performance.
- B. Financial and nonfinancial aspects of performance that are essential to have a competitive advantage.
- C. The key nonfinancial performance indicators on a balanced scorecard.
- D. The aspects of a business that are focused on measuring key costs.

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 6: The Balanced Scorecard

Question: 170 A sign of the successful implementation of a balanced scorecard is the presence of cause-and-effect relationship. An example of this success for a hotel is meeting the target of

- A. Decreasing a customer's check-in time, which causes an increase in the number of implemented employee suggestions.
- B. Increasing employee training hours, which causes employee compensation to increase.
- C. Increasing profit, which causes an increase in employee job satisfaction ratings.
- D. Receiving more 5-star ratings from customers, which causes an increase in profit.

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 6: The Balanced Scorecard

Question: 171 An example of an item that would fall under the customer perspective on the balanced scorecard of an airline is

- A. Customer complaints will decrease by 10%.
- B. Customers will have to wait no longer than 15 minutes to check their bags.
- C. 90% of the flights will arrive on time.
- D. Three new in-flight meals will replace existing offerings that are unpopular with customers.

Question: 172 Which of the following statements is **false** with respect to best practices analysis?

- A. The balanced scorecard facilitates best practice analysis.
- B. Best practice analysis is a way or method of accomplishing a business function or process that is considered to be superior to all other known methods.
- C. Best practices analysis assumes that a lesson learned from one area of a business can be passed on to another area of the business or between businesses.
- D. The concept of benchmarking is incompatible with best practices analysis.

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 6: The Balanced Scorecard

Question: 173 In strategic planning, PEST analysis is **best** described as evaluating which of the following factors?

- A. Political, economic, social, and technological.
- B. People, environment, sustainability, and tactics.
- C. Process, efficiency, scale, and timing.
- D. Products, employees, strengths, and threats.

Question: 174 On a balanced scorecard, each of the following is an example of the customer perspective measure **except**

- A. Economic value-added.
- B. Customer retention.
- C. Time taken to fulfill orders.
- D. Number of customer complaints.

Question: 175 Which of the following cycles does not have accounting information recorded into the required general ledger reporting system?

- A. Expenditure.
- B. Production.
- C. Planning.
- D. Revenue.

Question: 176 What is strategic planning?

- A. It establishes the general direction of the organization.
- B. It establishes the resources that the plan will require.
- C. It establishes the budget for the organization.
- D. It consists of decisions to use parts of the organization's resources in specified ways.

Question: 177 A distinction between forecasting and planning

- A. Is not valid because they are synonyms.
- B. Arises because forecasting covers the short-term and planning does not.
- C. Is that forecasts are used in planning.
- D. Is that forecasting is a management activity whereas planning is a technical activity.

Question: 178 Which of the following is an example of an outcome of strategic planning?

- A. A formal statement of the organization's definition of the fundamental truths that guide its actions.
- B. A broad statement of concepts that emphasizes the implementation of organizational objectives over the long term.
- C. A set of general guides for action that channel thinking and allow a certain amount of discretion in execution.
- D. A document specifying a sequence of steps detailing the exact manner in which a certain activity must be accomplished.

Study Unit 8: Analysis, Forecasting, and Strategy | Subunit 7: Strategic Planning

Question: 179 Which one of the following management considerations is usually addressed first in strategic planning?

- A. Outsourcing.
- B. Overall objectives of the firm.
- C. Organizational structure.
- D. Recent annual budgets.

Question: 180 Strategy is a broad term that usually means the selection of overall objectives. Strategic analysis ordinarily **excludes** the

- A. Trends that will affect the entity's markets.
- B. Target product mix and production schedule to be maintained during the year.
- C. Forms of organizational structure that would best serve the entity.
- D. Best ways to invest in research, design, production, distribution, marketing, and administrative activities.

Question: 181 All of the following are characteristics of the strategic planning process **except** the

- A. Emphasis on long run.
- B. Analysis of external economic factors.
- C. Review of the attributes and behavior of the organization's competition.
- D. Analysis and review of departmental budgets.

Question: 182 Strategic planning, as practiced by most modern organizations, includes all of the following **except**

- A. Top-level management participation.
- B. A long-term focus.
- C. Strategies that will help in achieving long-range goals.
- D. Analysis of the current month's actual variances from budget.

Question: 183 An organization's policies and procedures are part of its overall system of internal controls. The control function performed by policies and procedures is

- A. Feedforward control.
- B. Implementation control.
- C. Feedback control.
- D. Application control.

Question: 184 The management of an organization has stated that two members of the same family may not be employed in the same department. Identify the component of organizational planning that is being demonstrated by management's action.

- A. A strategy.
- B. A policy.
- C. An objective.
- D. A mission statement.

Question: 185 Formal written policies are normally recommended. However, the presence of certain conditions in an organization minimizes the need for written policies. One condition that minimizes the need for written policies is a

- A. High division of labor.
- B. Strong organizational culture.
- C. Large span of control.
- D. Strict unity of command.

Question: 186 During the strategic planning process, which one of the following is an external factor to be analyzed?

- A. Organizational culture.
- B. Societal culture.
- C. Employee morale.
- D. Organizational structure.

Question: 187 A company has a compensation system for its managers based on a management-by-objectives (MBO) approach. The essential premise of MBO is that

- A. Compensation should be based on qualitative factors.
- B. Employees should be concerned with routine matters, and managers should attend to exceptions.
- C. Employees should participate in setting objectives.
- D. Managers should establish objectives for their employees.

Question: 188 MBO managers are **most** likely to believe that employees

- A. Dislike their work.
- B. Avoid responsibility whenever possible.
- C. Work best when threatened with punishment.
- D. Are self-motivated.

Question: 189 A company has established a strategic initiative to increase operating income by increasing market share through being the lower-cost provider. Assuming the total market size remains the same, and based on the information provided below, has the company achieved the stated objectives?

	<u>Current Year</u>	<u>Next Year</u>
Revenues	\$325,000	\$325,000
Cost of goods sold	152,000	146,000
Gross margin	<u>\$173,000</u>	<u>\$179,000</u>
Operating costs		
Marketing	100,000	100,000
Administrative	50,000	50,000
Operating income	<u>\$ 23,000</u>	<u>\$ 29,000</u>
Units sold	1,000	1,000

- A. Yes, because the company was able to lower costs and increase operating income.
- B. No, because the company did not reduce marketing and administrative costs.
- C. Yes, because the statements show a reduced cost of goods sold.
- D. No, because it does not appear that the company has increased market share.