

Quiz 1 (STAT-201)

State whether the following statements are True or False.

1. A mathematical model shows the relationship between quantifiable and non-quantifiable information. (F)
2. A series of steps or procedures that are repeated is known as an algorithm. (T)
3. A picture, drawing, or chart of reality is not a schematic model. (F)
4. Utility values typically range from -1 to $+1$. (F)
5. The decision theory processes of maximizing expected monetary value (EMV) and minimizing expected opportunity loss (EOL) should lead us to choose the same alternatives. (T)
6. The EMV approach and Utility theory always result in the same choice of alternatives. (F)
7. The Delphi method solicits input from customers or potential customers regarding their future purchasing plans. (F)
8. The process of isolating linear trend and seasonal factors to develop a more accurate forecast is called regression. (F)

Tick the right answer from the answers given below

1. The break-even point is an example of a
 - a. postoptimality model.
 - b. quantitative analysis model.**
 - c. schematic model.
 - d. sensitivity analysis model.
2. The ability to examine the variability of a solution due to changes in the formulation of a problem is an important part of the analysis of the results. This type of analysis is called _____ analysis.
 - a. Sensitivity**
 - b. Implicit
 - c. Normal
 - d. scale
3. The condition of improper data yielding misleading results is referred to as
 - a. garbage in, garbage out.**
 - b. break-even point.
 - c. uncontrollable variable.
 - d. postoptimality.

4. The following is a payoff table giving profits for various situations.

Alternatives	States of Nature		
	A	B	C
Alternative 1	120	140	120
Alternative 2	200	100	50
Alternative 3	100	120	180
Do Nothing	0	0	0

What decision would an optimist make?

- a. Alternative 1
 - b. Alternative 2**
 - c. Alternative 3
 - d. Do Nothing
5. What is the range of the Hurwicz criterion coefficient of realism α ?
- a. 1 to 100
 - b. 1 to 10
 - c. 0 to 10
 - d. 0 to 1**
6. A market research survey is available for \$10,000. Using a decision tree analysis, it is found that the expected monetary value with the survey is \$75,000. The expected monetary value with no survey is \$62,000. What is the expected value of sample information?
- a. -\$7,000
 - b. \$3,000
 - c. \$7,000
 - d. None of the above**
7. A seasonal index of _____ indicates that the season is average.
- a. 10
 - b. 100
 - c. 0.5
 - d. 1**
8. Daily demand for newspapers for the last 10 days has been as follows: 12, 13, 16, 15, 12, 18, 14, 12, 13, 15 (listed from oldest to most recent). Forecast sales for the next day using a two-day weighted moving average where the weights are 3 and 1 (the highest weight is for the most recent number).
- a. 14.5.**
 - b. 13.5.
 - c. 14.
 - d. 12.25.

Quiz 2 (STAT-201)

State whether the following statements are True or False.

1. The coefficient of correlation also expresses the degree of strength of the linear relationship. (T)
2. If an independent variable is correlated with a combination of other independent variables, the condition of multicollinearity exists. (T)
3. A bank with a single queue to move customers to several tellers is an example of a single-channel system. (F)
4. The wait time for a single-channel system is more than twice that for a two-channel system using two servers working at the same rate as the single server (T)
5. The three basic components of a queuing process are arrivals, service facilities, and the actual waiting line. (T)
6. The four queuing models (M/M/1, M/M/S, M/D/1 and Limited population) that have three characteristics in common are Poisson distribution arrivals, FIFO discipline and a single-service phase. (T)
7. The linear programming transportation model allows us to solve problems where supply does not equal demand. (T)
8. Linear programming is a qualitative technique which helps to collect data systematically. (F)

Tick the right answer from the answers given below

1. In production scheduling LP problems, inventory at the end of this month is set equal to _____.
 - a. **Inventory at the end of last month + this month's production – this month's sales**
 - b. Inventory at the beginning of last month + this month's production – this month's sales
 - c. Inventory at the end of last month + last month's production – this month's sales
 - d. Inventory at the beginning of last month + last month's production – last month's sales
2. Linear programming is usually used by managers involved in portfolio selection to
 - a. **Maximize return on investment.**
 - b. Maximize investment limitations.
 - c. Maximize risk.
 - d. Minimize risk
3. Decision Variables:
 - a. **Tell how much or how many of something to produce, invest, purchase, hire, etc.**
 - b. Represent the values of the constraints
 - c. Measure the objective function
 - d. Must exist for each constraint

4. Which of the following is **not** an assumption in common queuing mathematical models?
- a. Arrivals come from an infinite, or very large, population.
 - b. Arrivals are Poisson distributed.
 - c. Arrivals are treated on a first-in, first-out basis and do not balk or renege.
 - d. **Service rates follow the normal distribution.**
5. Most systems use a queue discipline known as _____.
- a. Shortest processing time
 - b. Longest processing time
 - c. **FIFO**
 - d. Earliest due date
6. In LP, variables do not have to be integer valued and may take on any fractional value. This assumption is called:
- a. Proportionality
 - b. **Divisibility**
 - c. Additivity
 - d. Certainty
7. A multiple regression model differs from a simple linear regression model because the multiple regression model has more than one:
- a. **Independent variable**
 - b. Dependent variable
 - c. Intercept
 - d. Error
8. A graph of the sample points that will be used to develop a regression line is called:
- a. A sample graph
 - b. A regression diagram
 - c. A scatter diagram
 - d. **A regression plot**

Quiz 3 (STAT-201)

State whether the following statements are True or False.

1. A media selection L.P application describes a method in which media producers select customers. (F)
2. The constraints in a transportation problem deal with requirements at each origin and capacities at each destination. (F)
3. Linear programming variables such as X_{11} , X_{12} and X_{13} could possibly be used to represent production of a product (X_{ij}) over several months. (T)
4. Inventory is such an expensive asset that it may account for as much as 50 percent of a firms invested capital. (T)
5. A stock out is a situation that occurs when there is no inventory on hand. (T)
6. The concept of inventory is applicable to both manufacturing and service organization. (T)
7. Transportation model may be used when a firm is trying to decide where to locate a new facility. (T)
8. The objective of an assignment problem solution most often is to minimize the total cost or time of performing the assigned tasks. (T)

Tick the right answer from the answers given below

1. Which of the following is considered as decision variable in the media selection problem of maximizing audience exposure
 - a. **The number of ads of each type**
 - b. The overall advertising budget
 - c. What type of ads to offer
 - d. None of these
2. The point (3,1) satisfy one of the following system
 - a. **$12x - y \geq 35$; $3x + y \leq 10$**
 - b. $3x - y \geq 9$; $4x + 5y \leq 11$
 - c. $2x + y \geq 6$; $3x - 5y \geq 15$
 - d. $x + y \geq 5$; $x + 2y \geq 3$
3. Which of the following constraints is not linear
 - a. **$2XY + Y = 15$**
 - b. $7A - 6B \leq 45$
 - c. $X + Y + 3Z \geq 35$
 - d. $K + L + M > 0$
4. In making inventory decision the purpose of the basic EOQ model is to
 - a. Minimize carrying cost
 - b. **Minimize the sum of carrying costs and ordering costs**
 - c. Minimize ordering cost
 - d. Minimize stock at hand

5. Which of the following is not considered a significant inventory cost
- a. Purchase cost
 - b. Cost of ordering
 - c. Cost of stockouts
 - d. **Cost of production labour**
6. Which of the following is not a part of the transportation algorithm
- a. North-west corner rule
 - b. Stepping stone method
 - c. **Portfolio selection**
 - d. Vogel's approximation method
7. Which of the following method is used only with the assignment problem
- a. **Hungarian method**
 - b. Stepping stone method
 - c. Simplex method
 - d. Vogel's approximation method
8. Annual ordering cost is given by the formula
- a. $\frac{D}{Q} C_0$
 - b. $\frac{D}{Q} + C_0$
 - c. $\frac{Q}{D} C_0$
 - d. $\frac{D}{Q}$

Quiz 4 (STAT-201)

State whether the following statements are True or False.

1. PERT and CPM are quantitative analysis tools designed to schedule and control large projects. (T)
2. Through the use of PERT/CPM, astute managers can derive flexibility by identifying noncritical activities and replanning, rescheduling, and reallocating resources such as personnel and finances. (T)
3. Gantt charts and PERT diagrams provide the same information, just in different formats. (F)
4. PERT was developed for a project for which activity or task times were uncertain. (T)
5. Simulation models are designed to generate optimal solutions, which can then be applied to real-world situations. (F)
6. Simulation models are useful for economic order quantity problems with probabilistic demand and lead time. (T)
7. A major advantage of using simulation techniques is to be able to study the interactive effect of individual components/variables. (T)
8. Simulation models may contain both deterministic and probabilistic variables. (T)

Tick the right answer from the answers given below

1. Slack time in a network is the
 - a. amount of time that an activity would take assuming very unfavorable conditions.
 - b. shortest amount of time that could be required to complete the activity.
 - c. difference between the expected completion time of the project using pessimistic times and the expected completion time of the project using optimistic times.
 - d. **amount of time that an activity can be delayed without delaying the entire project.**
2. Your company is considering submitting a bid on a major project. You determine that the expected completion time is 100 weeks and the standard deviation is 10 weeks. It is assumed that the normal distribution applies. You wish to set the due date for the project such that there is an 85 percent chance that the project will be finished by this time. What due date should be set? (The probability of 0.85 associated with Z value 1.04)
 - a. 108.0
 - b. **110.4**
 - c. 89.6
 - d. 85.0

3. Given an activity's optimistic, most likely, and pessimistic time estimates of 4, 6, and 14 days respectively, compute the PERT expected activity time for this activity.
- a. 8
 - b. 6
 - c. **7**
 - d. 9
4. The time estimates in PERT are:
- a. Optimistic time
 - b. Pessimistic time
 - c. Most likely time
 - d. **All of above**
5. Which of the following scenarios would require simulation for a queuing model?
- a. Poisson arrival process
 - b. exponential service time
 - c. deterministic arrival process
 - d. **None of the above**
6. Which of the following is not considered one of the 5 steps of Monte Carlo Simulation?
- a. establishing probability distributions for important input variables
 - b. generating random number
 - c. building a cumulative probability distribution for each input variable
 - d. **establishing an objective function**
7. The logic in a simulation model is presented graphically through which of the following?
- a. scatter plot
 - b. **flowchart**
 - c. blueprint
 - d. decision tree
8. Simulation can be effectively used in many
- a. inventory problems.
 - b. maintenance policy problems.
 - c. sales forecasting problems.
 - d. **All of the above**