

## Unit 4 : Week 4 - Mid-Term

1. What is a mathematical model? Give some examples of various types of models. Provide two good real world practical applications of the use of mathematical models in business environment. Show how the problem was solved using the models created. (Points : 10)

2. The normal distribution is the most important distribution in statistics. It is also used in many business processes. Provide examples of two business processes that can be described by the normal distribution. Demonstrate the use of the normal distribution by providing two practical example showing how the normal distribution was used to solve a real world problem. Show your work in detail along with the results and decisions made. (Points : 10)



3. There are several techniques used to solve decision - making problems. Describe the techniques used to solve problems under uncertainty. Which techniques results in an optimistic decision? Which techniques results in a pessimistic decision? Provide a detailed real world example of each. (Points : 10)

Spellchecker



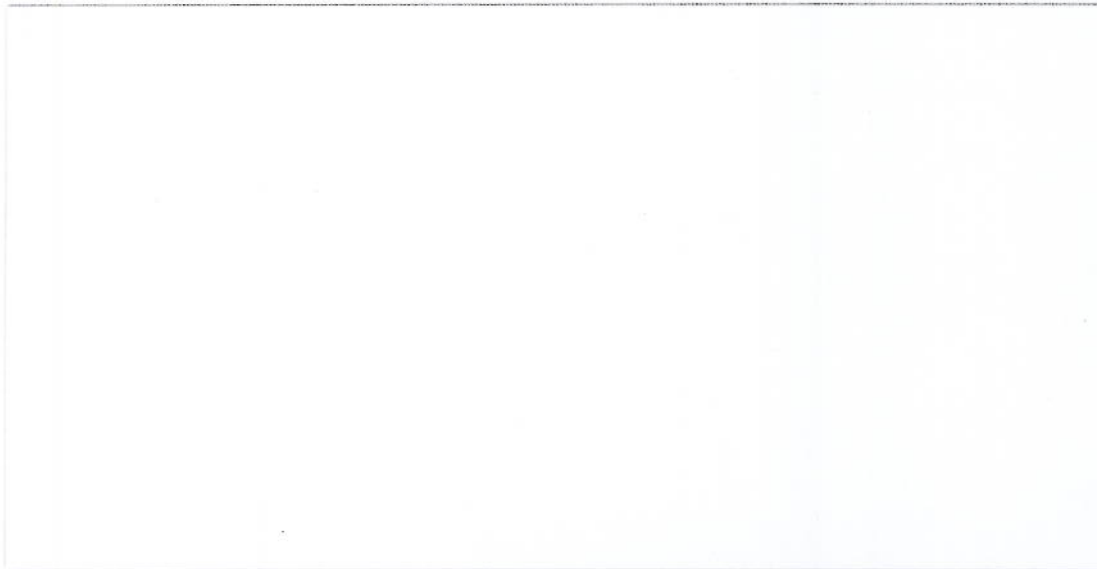
4. Regression analysis is an extremely valuable quantitative tool. Briefly discuss the following using a real world example:

- How the coefficient of variation and the correlation coefficient are related and how they are used in regression analysis.

- How scatter diagrams can be used to identify the type of regression to use.

- The methods used to determine if the regression model is a good model for the presented dependent and independent variable(S). (Points : 10)

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5. No forecasting method is perfect under all conditions. Briefly describe the steps used to develop a forecasting system. What is the difference between a causal model and a time-series model. What is a qualitative forecasting model, and when is it appropriate. Provide a real world example of each type of model. (Points : 10)

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6. We discussed the fundamentals of inventory control theory. The two key take aways are 1) how much to order and 2) when to order. Discuss the following aspects of inventory control models:

- A) Why inventory an important consideration for managers.
- B) The purpose of inventory control
- C) Why would not a company always store large quantities of inventory to eliminate shortages and stockouts.
- D) Under what circumstances can inventory be used as a hedge against inflation.

(Points : 10)

Spellchecker

