

**ALLAMA IQBAL OPEN UNIVERSITY, ISLAMABAD
COL MBA/MPA PROGRAMME**

QUANTITATIVE TECHNIQUES (5564)

CHECKLIST

SEMESTER: AUTUMN, 2012

This packet comprises the following material:

1. Text Books
2. Course Outlines
3. Assignment No. 1, 2
4. Assignment Forms (2 sets)

In this packet, if you find anything missing out of the above mentioned material, please contact at the address given below:

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ALLAMA IQBAL OPEN UNIVERSITY, ISLAMABAD
(Commonwealth MBA/MPA Programme)

WARNING

- 1. PLAGIARISM OR HIRING OF GHOST WRITER(S) FOR SOLVING THE ASSIGNMENT(S) WILL DEBAR THE STUDENT FROM AWARD OF DEGREE/CERTIFICATE, IF FOUND AT ANY STAGE.**
- 2. SUBMITTING ASSIGNMENTS BORROWED OR STOLEN FROM OTHER(S) AS ONE'S OWN WILL BE PENALIZED AS DEFINED IN "AIOU PLAGIARISM POLICY".**

Course: Quantitative Techniques (5564)
Level: COL MBA/MPA Programme

Semester: Autumn, 2012
Total Marks: 100

Instructions:

- (a) All written assignment must be well organized, presented in an easy-to-read format and neat. Moreover, pay particularly close attention to grammar, spelling, punctuation and understandability. Communication is extremely important in this course.
- (b) Documentation is likewise very important. Un-supported statements or opinions are worth less to the reader, who desires to verify your finding. Complete and specific documentation is mandatory. Also, your references should be to primary sources, except in rare unusual situation.
- (c) Quoting should be kept to an absolute minimum.

Guidelines for Doing Assignments

We expect you to answer each question as per instructions in the assignment. You will find it useful to keep the following points in mind:

- 1) **Planning:** Read the assignments carefully, go through the Units on which they are based. Make some points regarding each question and then rearrange them in a logical order.
- 2) **Organization:** Be a little selective and analytical before drawing up a rough outline of your answer. Give adequate attention to question's introduction and conclusion.
Make sure that:
 - a) The answer is logical and coherent,
 - b) It has clear connections between sentences and paragraphs,
 - c) The presentation is correct in your own expression and style.
- 3) **Presentation:** Once you are satisfied with your answer, you can write down the final version for submission. It is mandatory to write all assignments neatly in your own handwriting. If you desire so, you may underline the points you wish to emphasize. Make sure that the answer is within the stipulated word limit.

ASSIGNMENT No. 1

Marks: 100

- Q. 1 a) Describe various statistical methods applied in business decision making. **(10)**
b) Explain the areas of applications of quantitative approach in business and management. **(10)**
- Q. 2 a) A person deposits Rs. 2000 per year in a special account paying 8% per annum. How much money is in his or her account after 5 years? **(10)**
b) Graph each function: **(10)**
i) $f(x) = |x - 2|$, ii) $f(x) = x^2 - 2$
- Q. 3 Solve the following system of equation by Gauss-Jordan elimination. **(20)**
 $2x_1 + 2x_2 + x_3 = 3$
 $3x_1 + x_2 - x_3 = 7$
 $x_1 - 3x_2 + 2x_3 = 0$
- Q. 4 The following data pertain to the demand for a product in thousands of units and price charged I in rupees in eight different locations. **(20)**

PRICE	DEMAND
14	150
12	180
15	112
13	140
18	86
15	124
9	223

- a) Obtain the line of best fit.
b) Determine the coefficient of correlation
c) Interpret your results
d) Predict the demand if the price is Rs.10.
- Q. 5 What are the best sources of data collection for the following? **(20)**
a) A bank loan officer wishes to forecast the economy of the country in which the bank operates.
b) A research project has the purpose of identifying the labor issues of concern to a union.
c) A manager must determine the best site for a convenience store in an urban area.
d) Median weekly earnings of full-time salaried workers for the range 1995-2000.
e) Annual sales of the top ten fast-food companies.
f) Number of airplane trips made by college students.

ASSIGNMENT No. 2

Total Marks: 100

Instructions:

1. This assignment is a research-oriented activity. You are required to develop a term paper and submit to the tutor for evaluation prior to the final examination. The last date of this assignment will be notified separately by our directorate of regional services and the same will be communicated to you directly as well as through approved study centers assigned to you.
2. You will have to participate in the activity fully, actively, and practically to be able to pass the final examination of the course. Please send one copy of this assignment to COL MBA/MPA Programme office, Block No. 11, Allama Iqbal Open University, Sector H-8, Islamabad.
3. For the preparation of this assignment, you should first thoroughly review the conceptual framework of the topic and develop a scholarly material of the same giving references, quotations, and extracts of various scholars and experts. Then visit any business/commercial organization and study the relevant practical aspects there. Combining the theoretical and practical aspects, develop a comprehensive paper consisting of at least 20 to 25 typed pages to be submitted to your tutor.
 - a) Introduction to the topic
 - b) Important sub-topics
 - c) Practical study of the organization with respect to the topic
 - d) Review of theoretical and practical situations, merits, de-merits deficiencies or strengths of the organization with respect to the topic under study.
 - e) Conclusion and recommendation
 - f) Annex, if any
4. Prepare a copy of this assignment and submit to your tutor for your evaluation.
5. You should add any illustrative material/data/tables/analysis for effective submission.
6. A number of topics given below are the general aspects of the course and you are required to select one of the topics according to the last digit of your roll number. For example, if the roll number is N-9337241, you will select topic number 1, and if the roll number is O-3427185 then you will select topic number 5 (the last digit).
 1. Measures of Central Tendency
 2. Discrete Probability Distributions
 3. Decision Theory
 4. Testing of Hypotheses
 5. Business Forecasting
 6. Time Series Analysis
 7. Measures of Variation and Skewness
 8. Collection of Data
 9. Basic Calculus and Applications
 0. Quantitative Decision Making

QUANTITATIVE TECHNIQUES (5564) COURSE OUTLINES

- 1. QUANTITATIVE DECISION MAKING – AN OVERVIEW**
 - 1.1 Introduction
 - 1.2 Meaning of quantitative techniques
 - 1.3 Statistics and operations research
 - 1.4 Classification of statistical methods
 - 1.5 Models in operations research
 - 1.6 Various statistical techniques
 - 1.7 Advantages of quantitative approach to management
 - 1.8 Quantitative techniques in business and management
 - 1.9 Use of computers

- 2. FUNCTIONS AND PROGRESSIONS**
 - 2.1 Introduction
 - 2.2 Definitions
 - 2.3 Types of function
 - 2.4 Solution of functions
 - 2.5 Business applications
 - 2.6 Sequence and series
 - 2.7 Arithmetic progression (AP)
 - 2.8 Geometric progression (GP)

- 3. BASIC CALCULUS AND APPLICATIONS**
 - 3.1 Introduction
 - 3.2 Limit and continuity
 - 3.3 Concept of slope and rate of change
 - 3.4 Concept of derivative
 - 3.5 Rules of differentiation
 - 3.6 Applications of the derivative
 - 3.7 Concept of maxima and minima with managerial applications

- 4. MATRIX ALGEBRA**
 - 4.1 Introduction
 - 4.2 Matrices: definition and notations
 - 4.3 Some special matrices
 - 4.4 Matrix representation of data
 - 4.5 Operations on matrices
 - 4.6 Determinant of a square matrix
 - 4.7 Inverse of a matrix
 - 4.8 Solution of linear simultaneous equations
 - 4.9 Applications of matrices

- 5. COLLECTION OF DATA**
 - 5.1 Introduction

- 5.2 Primary and secondary data
- 5.3 Methods of collecting primary data
- 5.4 Designing a questionnaire
- 5.5 Pre-testing the questionnaire
- 5.6 Editing primary data
- 5.7 Sources of secondary data
- 5.8 Precautions in the use of secondary data
- 5.9 Census and sample

6. PRESENTATION OF DATA

- 6.1 Introduction
- 6.2 Classification of data
- 6.3 Objectives of classification
- 6.4 Types of classification
- 6.5 Construction of a discrete frequency distribution
- 6.6 Construction of a continuous frequency distribution
- 6.7 Guidelines for choosing the classes
- 6.8 Cumulative and relative frequencies
- 6.9 Charting of data

7. MEASURES OF CENTRAL TENDENCY

- 7.1 Introduction
- 7.2 Significance of measures of central tendency
- 7.3 Properties of a good measure of central tendency
- 7.4 Arithmetic mean
- 7.5 Mathematical properties of arithmetic mean
- 7.6 Weighted arithmetic mean
- 7.7 Median
- 7.8 Mathematical property of median
- 7.9 Quantiles
- 7.10 Mode
- 7.12 Locating the mode graphically
- 7.13 Relationship among mean, median and mode
- 7.14 Geometric mean
- 7.15 Harmonic mean

8. MEASURES OF VARIATION AND SKEWNESS

- 8.1 Introduction
- 8.2 Significance of measuring variation
- 8.3 Properties of a good measure of variation
- 8.4 Absolute and relative measures of variation
- 8.5 Range
- 8.6 Quartile deviation
- 8.7 Average deviation
- 8.8 Standard deviation
- 8.9 Coefficient of variation

- 8.10 Skewness
- 8.11 Relative skewness

9. BASIC CONCEPT OF PROBABILITY

- 9.1 Introduction
- 9.2 Basic concepts: experiment, sample space, event
- 9.3 Different approaches to probability theory
- 9.4 Calculating probabilities in complex situations
- 9.5 Revising probability estimate

10. DISCRETE PROBABILITY DISTRIBUTIONS

- 10.1 Introduction
- 10.2 Basic concepts: random variable and probability distribution
- 10.3 Discrete probability distributions
- 10.4 Summary measures and their applications
- 10.5 Some important discrete probability distributions

11. CONTINUOUS PROBABILITY DISTRIBUTIONS

- 11.1 Introduction
- 11.2 Basic concepts
- 11.3 Some important continuous probability distributions
- 11.4 Applications of continuous distributions
- 11.5 Summary

12. DECISION THEORY

- 12.1 Introduction
- 12.2 Certain key issues in decision theory
- 12.3 Decision tree approach
- 12.5 Reference theory
- 12.6 Other approaches

13. SAMPLING METHODS

- 13.1 Introduction
- 13.2 Why sampling
- 13.3 Types of sampling
- 13.4 Probability sampling methods
- 13.5 Probabilty sampling methods
- 13.6 The sample size

14. SAMPLING DISTRIBUTIONS

- 14.1 Introduction
- 14.2 Sampling distribution of the mean
- 14.3 Central limit theorem
- 14.4 Sampling distribution of the variance
- 14.5 The student's distribution
- 14.6 Sampling distribution of the proportion

- 14.7 Interval estimation
- 14.8 The sample size

15. TESTING OF HYPOTHESES

- 15.1 Introduction
- 15.2 Some basic concepts
- 15.3 Hypothesis testing procedure
- 15.4 Testing of population mean
- 15.5 Testing of population proportion
- 15.6 Testing for difference between means
- 15.7 Testing for difference between proportions

16. CHI-SQUARE TESTS

- 16.1 Introduction
- 16.2 Testing of population variance
- 16.3 Testing of equality of two population variances
- 16.4 Testing an goodness of fit
- 16.5 Testng independence of categorised data

17. BUSINESS FORECASTING

- 17.1 Introduction
- 17.2 Forecasting for long term decision
- 17.3 Forecating for medium and short term decisions
- 17.4 Forecast control

18. CORRELATION

- 18.1 Introduction
- 18.2 The correlation coeffecient
- 18.3 Testing for the significance of the correlation coeffecient
- 18.4 Bank correlation
- 18.5 Practical application of correlation
- 18.6 Auto-correlation and time series analysis

19. REGRESSION

- 19.1 Introduction
- 19.2 Fitting a straight line
- 19.3 Examining the fitted straight line
- 19.4 An example of the calculations
- 19.5 Variety of regression models

20. TIME SERIES ANALYSIS

- 20.1 Introduction
- 20.2 Decomposition methods
- 20.3 Example of forecasting using decomposition
- 20.4 Use of auto-correlations in identifying time series
- 20.5 An outilne of box-jenkins for time series

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