

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

QUANTITATIVE TECHNIQUES (5564)

CHECKLIST

SEMESTER: AUTUMN, 2013

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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Mailing Section, Block No. 28
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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 2013

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

(Blocks: 1–10)

Total Marks: 100

- Q. 1 (a) List and discuss various statistical techniques which are useful to a decision maker in solving problems, clearly state the purpose of these techniques and hence highlight the advantages of quantitative approach to management. **(10)**
- (b) Describe the main area of public systems where statistics can be used. **(10)**
- Q. 2 (a) What are functions? Describe different types of functions. Discuss the business applications of one such function with the help of an example. **(10)**
- (b) Explain the concept of a derivative. Discuss few applications of derivative in business. **(10)**
- Q. 3 (a) Calculate median, 6th decile and 40th percentile from the following data: **(10)**

Wages per week	No. of workers
50 – 100	15
100 – 150	40
150 – 200	35
200 – 250	60
250 – 300	125
300 – 350	100
350 – 400	70
400 – 450	40
450 – 500	15

- (b) Use Cramer's rule for a 3 x 3 system of linear equations to solve the following system: **(10)**

$$2x - y + 3z = -3$$

$$-x - y + 3z = -6$$

$$x - 2y - z = 2$$

- Q. 4 (a) Grades for 50 students from a previous MAT test are summarized below:

Class	Frequency
40–50	4
50–60	6
60–70	10
70–80	15
80–90	10
90–100	5

Find the sample mean, the sample variance and standard deviation for the grouped data. **(10)**

- (b) For the data given below, compute the quartile deviation. (10)

Monthly wages (Rs.)	No. of workers
Below 850	12
850–900	16
900–950	39
950–1000	56
1000–1050	62
1050–1100	75
1100–1150	30
1150 and above	10

- Q. 5 (a) Distinguish between Karal Pearson's and Bowley's coefficient of skewness. Which one of these would be prefer and why? (10)
- (b) Calculate Karal Pearsons' and Bowley's coefficient of skewness from the following data and comment on its value. (10)

Monthly wages (Rs.)	No. of workers
Below 600	10
600–700	25
700–800	45
800–900	20
900–1000	15
1000 & above	5

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. Functions and Progression
 2. Sampling Methods
 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 Determininant 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 Guielines 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 variaton
 - 8.3 Properties of a good measure of varition
 - 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 Coeffecient 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 varable and probability distribution
 - 10.3 Discrete probability distributions
 - 10.4 Summary measures and their applictions
 - 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 Probabilitiy 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

