

**ALLAMA IQBAL OPEN UNIVERSITY, ISLAMABAD
(Department of Business Administration)**

BUSINESS MATHEMATICS AND STATISTICS (523)

CHECKLIST

Semester: Autumn, 2013

This packet comprises the following material:

1. Two Text Book; (Two)
2. Course Outline;
3. Assignment No. 1 and 2;
4. Assignment Forms (2 sets);
5. Schedule for submitting Assignments

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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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: Business Mathematics and Statistics (523) Semester: Autumn, 2013
Level: MBA Total Marks: 100

ASSIGNMENT No. 1

- Q.1 a) A data processing manager purchased remote terminal processing time to run special jobs at two different computer "utilities". She wishes to sign a long-term contract with the firm whose computer causes the least delay on the average. The numbers of minutes of delayed processing per week were obtained during trial periods with each firm and are provided below:
- | | | | | | | | | | |
|-------------|-----|-----|-----|----|-----|-----|-----|-----|--|
| Compu Quick | 210 | 15 | 47 | 93 | 104 | | | | |
| Dial-a-Pute | 18 | 341 | 523 | 25 | 19 | 293 | 115 | 203 | |
- Assuming that trial experience is representative of future performance, which firm should receive the business? Substantiate your answer with appropriate calculations.
- b) The length of life of 220 incandescent 60-watt lamps was obtained and yielded the frequency distribution shown in the table given below:

Class Limit	Frequency
500-599	3
600-699	7
700-799	14
800-899	28
900-999	64
1000-1099	57
1100-1199	23
1200-1299	13
1300-1399	7
1400-1499	4

1. Construct a histogram of these data, using a vertical scale for relative frequencies.
2. Find the mean length of life

3. Find the standard deviation (20)
- Q.2 a) A hard working student has 90 percent chance to pass the examination and that pass percentage of the university is 28 percent. Suppose 20% students work hard. What is the probability that a person who has passed has really worked hard?
- b) A sales person has 10 percent chance of making a sale to any customer who is called upon. If 20 calls are made, what is the chance that (i) fewer than three sales are made (ii) At least one sale is made (iii) More than five are made? (20)
- Q.3 a) The wrist circumference of adult males is normally distributed with a mean of $\mu = 6.85$ " and a standard deviation of $\sigma = 0.40$ ". One man is selected at random. Determine the probabilities for the following possible wrist sizes.
1. Less than 8.00"
 2. Between 5.75" and 6.75"
- b) The achievement scores for a college entrance examination are normally distributed with a mean of 75 and a standard deviation of 10. What fraction of the scores would you expect to lie between 70 and 90? (20)
- Q.4 The shopping times were recorded for 64 randomly selected customers for a local supermarket. The average and variance of the 64 shopping times were 33 minutes and 256, respectively. Estimate the true average shopping time per customer, with a confidence coefficient of $1-\alpha = 0.90$. (20)
- Q.5 A vice-president for a large corporation claims that salesmen are averaging no more than 15 sales contacts per week. (She would like to increase this figure) As check on her claim, 36 salesmen are selected at random, and the number of contacts is recorded for a single randomly selected week. The sample reveals a mean of 17 contacts and a variance of 9. Does the evidence contradict the vice-president's claim? Use $\alpha = 0.50$. (20)

ASSIGNMENT No. 2

This assignment is a research-oriented activity. You are required to select one of the following topics according to the last digit of your roll number. For example, if your roll number is D-3427185 then you will select topic number 5 (the last digit). Visit any business/commercial organization and write a paper of about 1000 words on the topic allotted to you. Prepare two copies of this report; submit one copy to your tutor for evaluation and use other for presentation in the class, which will be held at the end of semester prior to your final examination.

- (1) Probability and their application in business

- (2) Prediction and regression
- (3) System of equations
- (4) Measures of relationship
- (5) Sampling methods and techniques in business statistics
- (6) Time series analysis
- (7) Estimation and hypothesis testing
- (8) Analysis of variance
- (9) Differentiation and their application in business.
- (0) Integration

WORKSHOPS

The workshop presentations provide students opportunity to express their communication skills, knowledge & understanding of concepts learned during practical study assigned in assignment # 2. You should use transparencies and any other material for effective presentation. The transparencies are not the presentation, but only a tool; the presentation is the combination of the transparencies and your speech. Workshop presentation transparencies should only be in typed format.

GUIDELINES FOR WORKSHOP PRESENTATION:

- Make eye contact and react to the audience. Don't read from the transparencies or from report, don't look too much at the transparencies (occasional glances are acceptable to help in recalling the topic to cover).
- A 15-minute presentation can be practiced several times in advance, so do that until you are confident enough. Some people also use a mirror when rehearsing as a substitute for an audience.

WEIGHTAGE OF THEORY & PRACTICAL ASPECTS IN ASSIGNMENT # 2 & WORKSHOP PRESENTATIONS

Assignment # 2 & workshop presentations are evaluated on the basis of theory & its applicability. The weightage of each aspect would be:

Theory:	60%
Applicability (practical study of the organization):	40%

BUSINESS MATHEMATICS AND STATISTICS 523

COURSE OUTLINE

Unit No.1: Descriptive Statistics

- 1.1 Introduction to Statistics
- 1.2 Role of Statistics in Business
- 1.3 Constructing a Frequency Distribution
- 1.4 Graphing Frequency Distribution
- 1.5 Measures of Central Tendency
- 1.6 Choosing Measures of Central Tendency
- 1.7 Percentiles, Deciles, and Quartiles
- 1.8 Measures of Dispersion
- 1.9 Range and Semi-Interquartile Range
- 1.10 Variance, Standard Deviation
- 1.11 Coefficient of Variation
- 1.12 Chebyshev's Inequality

Unit No. 2: Probability

- 2.1 Sample Spaces and Events
- 2.2 Definitions of Probability
- 2.3 Addition and Multiplication rules of Probability
- 2.4 Conditional Probability
- 2.5 Baye's Theorem
- 2.6 Probability Distribution
- 2.7 Discrete Probability Distribution
- 2.8 Expected Values and Variance
- 2.9 Continuous Probability Distribution
- 2.10 Binomial Distribution
- 2.11 Poisson Distribution
- 2.12 Hypergeometric Distribution
- 2.13 The Normal Distribution

Unit No. 3: Sampling and Sampling Distribution

- 3.1 Population and Sample
- 3.2 Parameters and Estimators
- 3.3 Reasons for Sampling
- 3.4 Random Sampling
- 3.5 Stratifies Random Sampling
- 3.6 Systematic Sampling
- 3.7 Cluster Sampling
- 3.8 Sampling Distributions
- 3.9 Point and Interval Estimation

- 3.10 Determination of Sample Size
- Unit No.4: Testing of Hypothesis**
- 4.1 Rationale of Hypothesis testing
 - 4.2 Type of Errors
 - 4.3 Testing Hypothesis about One Mean
 - 4.4 Testing Hypothesis about Two Means
 - 4.5 Testing Hypothesis about Proportions
 - 4.6 Goodness of Fit
 - 4.7 Contingency Table Analysis
- Unit No.5: Regression and Correlation Analysis**
- 5.1 Functional relationship between Two Variables
 - 5.2 Scatter Diagram
 - 5.3 Linear Correlation
 - 5.4 Inferences Concerning Correlation Coefficient
 - 5.5 Linear Regression Equation
 - 5.6 Principle of Least Squares
 - 5.7 Estimating Regression Equation
 - 5.8 Coefficient of Determination
 - 5.9 Multiple Regression and Correlation Analysis
- Unit No.6: Time Series and Index Numbers**
- 6.1 Introduction to Time Series
 - 6.2 Components of Time Series
 - 6.3 Measures of trend and Seasonal Variation
 - 6.4 Time Series analysis in Forecasting
 - 6.5 Defining and Index Number
 - 6.6 Unweighted Aggregate Index
 - 6.7 Price, Quantity and Value Indices
 - 6.8 CPI and its Uses
- Unit No.7: Set Theory and System of Linear Equations**
- 7.1 Set Theory, Types of Sets
 - 7.2 Methods of representing Sets
 - 7.3 Venn Diagram
 - 7.4 Solution of Linear Systems
 - 7.5 System of Linear Equations and its Applications
 - 7.6 Linear Inequalities
 - 7.7 Quadratic Inequalities
- Unit No. 8: Matrices**
- 8.1 Introduction to Matrix
 - 8.2 Addition and Multiplication of Matrices
 - 8.3 Row Operations

- 8.4 Determinant
- 8.5 Inverse of a Matrix
- 8.6 Systems of m Equations in n Unknowns
- 8.7 Applications of Matrices in Business

Unit No. 9: Differentiation and Integration

- 9.1 Instantaneous rate of change
- 9.2 Rules of differentiation
- 9.3 Relative Maxima and Relative Minima
- 9.4 Test for determination of Maxima and Minima
- 9.5 Indefinite Integral
- 9.6 Definite Integral
- 9.7 Methods of Integration
- 9.8 Application in Business

Recommended Books:

Levin, R. I., & Rubin, D. S. (2009). *Statistics for Management* (7th Ed.). Delhi, India: Dorling Kindersley Ltd (under the license of Pearson Education).

Lind, D. A., Marchal, W. G., & Wathen, S. A. (2005). *Statistical Techniques in Business and Economics* (12th ed.). USA: McGraw-Hill Irwin

Holcomb, Jr. (2010). *Mathematics with Applications in Management, Natural, and Social Sciences* (10th ed.). USA: Addison Wesley Publishers.

James, T. M., Benson, P. G., & Sincich, T. (2010). *Statistics for Business and Economics* (11th ed.). USA: Prentice Hall.

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