FINAL ON 5-3-2014

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

BUSINESS MATHEMATICS (BBA-135)

(CHECKLIST)

SEMESTER: SPRING 2014

This packet comprises the following material:

1. Text Book (one)
2. Course Outline
3. Assignment No. 1 & 2
4. Assignment Forms (2 sets)

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".**

ASSIGNMENT No. 1
(Units: 1–5)

Course: Business Mathematics (135) **Semester: Spring 2014**
Level: BBA **Total Marks: 100**
Pass Marks: 40

Note: All questions are compulsory and carry equal marks.

Q. 1 (a) Let A={2,4,6,8,10], B={6,8,11,12} and U={1,2,3,4,5,6,7,8,9,10,11,12}
Find
(1) A^c (2) $A \cup B$ (3) $(A \cup B)^c$ (4) $A \cap B$

(b) A store manager plans to increase the selling price of an item by 7%. If the item costs $6.52 and presently sells for $8.95. How much increase in price occurs after the increase in selling price.

(c) Find the equation of a line containing the points (4, 7) and 3, –6). **(20)**

Q. 2 (a) A service industry Williams's system has the following input coefficient matrix.

Services	0.3	0.2	0.3
Manufacturing	0.5	0.2	0.1
Farming	0.1	0.3	0.1

If the demand from the consumer section are 21, 5 and 1 units respectively. Find the output needed for these demands.

(b) Find the solution set of the following equations:
1. $6x + 2y = 6$ and $12x + 4y = 12$
2. $0.02x - 0.4y = -0.2$; and $0.04x + 0.6y = 3.8$ **(20)**

Q. 3 (a) A company is considering two products Type I and type II. Type I requires ¼ hours on a drill and 1/8 hours on a lathe. Type II requires ½ hours on a drill and ¾ hours on a lathe. The profit from Type I is $50 per product, and the profit from Type II is $102 per product. If the machines are limited to 8

hours per day, how many of each product should be produced to maximize profit?

(b) Graph the following functions:
1. $2x^2 - y^2 = 9$ 2. $3xy = 4$ **(20)**

Q. 4 (a) Minimize $2y_1 + 5y_2 = C$
Subject to:
$3y_1 + 2y_2 \geq 8$
$Y_1 + 4y_2 \geq 6$
$Y_1 \geq 0$
$Y_2 \geq 0$

(b) Solve the following system of equations by using the inverse matrix method:
$2x + 4y = 10$
$3x - 4y = 6$ **(20)**

Q. 5 Find the payment needed each month to pay off a debt of $1000 at 12% interest compounded semi annually. **(20)**

ASSIGNMENT No. 2

(Units: 6–9) **Total Marks: 100**

Note: All questions are compulsory and carry equal marks.

Q. 1 There are six roads from A to B and four roads between B and C.
(a) In how many ways can the trip be made?
(b) In how many ways can she drive round trip from A to B to C and return to A through B.
(c) Prepare tree diagram to support your answer. **(20)**

Q. 2 Three manufacturing plants A, Z, and N supply respectively 60%, 10%, and 30% of all shock absorbers used by a certain manufacturer. Records show that the percentage of defective items produced by A, Z and N is 1%, 2%, and 3% respectively. What is the probability that a randomly chosen shock absorber installed by the manufacturer will be defective? **(20)**

Q. 3 (a) A nationwide promotion promises a first prize of $25000 two second prices of $5000 and four third prices of $1000. A total of 950000 persons enter the lottery. What is the expected value of the lottery if the lottery cost nothing to enter?

(b) Find the fixed probability vector for the matrix **(20)**

$$\begin{bmatrix} 0 & 1 \\ 3/5 & 2/5 \end{bmatrix}$$

Q. 4 The probability of a person passing the test for a driver's license on the first try is 0.75. The probability that an individual who fails on the first test will pass on the second try is 0.80, and the probability that an individual who fails the first and second tests will pass the third time is 0.70. Find the probability that an individual

(a) fails both the first and second tests;
(b) will fail three times in a row;
(c) will require at least two tries to pass the test. **(20)**

Q. 5 (a) If a marginal revenue function is given by

$MR = 8000 - 0.8x$

Find the total revenue for a sale of 300 items. What is the maximum revenue?

(b) Evaluate the following definite integrals:

1. $\int_0^1 x\sqrt{x^2+1}\ dx$
2. $\int_0^2 3x\sqrt{3x^2+1}\ dx$ **(20)**

BUSINESS MATHEMATICS
(Course Outline BBA-135)

Unit 1 Fundamental Concepts of Modern Mathematics

- Introduction to Set Notation
- The Real Numbers
- Solution Sets for Equations and Inequalities
- Graphs
- Slopes and Linear Equations
- Applications of Percentages in Business

Unit 2 Equations and Inequalities

- Rectangular Co-Ordinates
- The Straight Line
- Solution of Linear Systems
- System of Linear Equalizations and Matrices
- Applications
- Linear Inequalities
- Quadratic Equations

Unit 3 Graphs and Functions

- Exponents and Radicals
- Concept of a Function
- Basic Operations with Algebraic Expressions
- Quadratic Functions and Quadratic Equations
- Aids to Graphing Functions
- Introduction to Graphs of Polynomial and Rational Functions
- Exponential Functions
- Logarithmic Functions

Unit 4 Introduction to Matrices with Application

- Addition of Matrices
- Matrix Multiplication
- Row Operations
- Inverse of a Matrix
- Systems of m Equations in Unknowns
- Application of Matrices in Business

Unit 5 Introduction to Linear Programming

- Introduction to Linear Programming
- Geometric Approach to Linear Programming
- The Simplex Method
- The Smilax Method of Maximization
- Minimization Using the Dual Problem

Unit 6 Mathematics of Finance

- Simple and Compound Interest
- Discount
- Geometric Progression and Annuities
- Sinking Fund
- Present Value of an Annuity; Amortization
- Future Value of an Annuity; Sinking Funds
- Leasing, Capital Expenditure

Unit 7 Probability and its Application

- Permutations and Combinations
- Experiments, Sample Spaces and Events
- Properties of the Probability of an Event
- Conditional Probability
- Expected Value
- Independent Events
- Bayes's Formula
- The Binomial Probability Model

Unit 8 The Derivatives

- The Concept of a Limit
- Continuous Functions
- The Average Rate of Change
- Formulas for Derivatives
- Relative Maxima and Relative Minima
- Absolute Maximum and Absolute Minimum
- Application of Derivatives in Business

Unit 9 Integration

- The Indefinite Integral
- Integration by Substitutions
- Integration by Parts
- Differential Equations
- The Definite Integral
- Application in Geometry: Area Under a Graph
- Application in Business

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