FUNDAMENTAL LEVEL

F6 - Business Mathematics and Statistics

Weightage

Part-A	Business Mathematics	50%
Part-B	Statistics	50%

Syllabus Overview:

This course comprises basic concepts and techniques of mathematics & statistics. A thorough knowledge in the areas of basic mathematics and presentation of data is an essential skill for management accountant. The management accountant should understand statistical concepts, because of the need to estimate the uncertainties of business decisions based on complex and variable factors. This course also gives basic understanding of mathematical techniques applied in corporate planning, management accounting, cost accounting, financial management and for sampling during audit.

Learning Outcomes:

On completion of this course, students will be able to:

- Understand the use of mathematical and statistical techniques
- Explain classification and presentation of data and information
- Comprehend linear, non-linear and simultaneous equations
- Apply functions and inequalities
- Apply differentiation
- Get acquainted with the use of integral calculus
- Apply mathematics of finance
- Use linear programming
- Apply measures of location
- Use measures of dispersion/ measures of shape of distribution
- Use correlation and linear regression/ time series (secular trend)
- Comprehend the use of index numbers
- Learn about probability theory and apply probability distributions, and statistical inference

Detailed Contents		Weightage in %	Level of Study Required
PART-A: BUSINESS MATHEMATICS			
1. Basic Mathematics	• Integers, fractions and decimals	10	U
	• Order of operations		U
	• Polynomial		U
	• Roots and powers		U
	• Factorization		U
	• Mathematical progressions		U & A
	– Arithmetic progressions		
	– Geometric progressions		
2. Linear and Non-Linear Equations	• Slope and intercept		U & A
	• Properties of linear equation		U & A
	• Co-ordinate system		U
	• Second degree equations		U
3. Simultaneous Equations Solution (Upto three variables)/ System of Equations	• Elimination method (excluding Gaussian elimination method)		U
	• Substitution Method		U
	• Graphic Method		U

4. Functions	● Functions and types of functions – Uni-variate and Bi-variate ● Domain and range – Restricted and unrestricted domain and range ● Exponential and logarithm functions ● Application of linear function ● Break-even analysis	10	U U U U & A U & A
5. Inequalities	● Inequalities (first and second degree)		U & A
6. Differentiation	● Average rate of change ● Concepts of derivative and differentiation ● Basic rules of differentiation ● Instantaneous rate of change		U, A & D U & A U U, A & D
7. Optimization Applications	● Relative minima, maxima and point of inflection ● Revenue, cost and profit application	15	U U, A & D
8. Integral Calculus	● Concept of integration (anti-derivatives) ● Application of integral calculus - converting marginal to total functions ● Other economic applications - calculation of consumers' surplus		U & A U & A U
9. Mathematics of Finance	● Concept of interest (time value of money) ● Simple and compound interest ● Nominal and effective rate ● Present and future value ● Concept of annuities ● Mortgage ● Concept of net present value (NPV) and internal rate of return (IRR) ● Cost benefit analysis through NPV and IRR ● Interpolation and perpetuities	15	U, A & D U & A U & A U & A U & A U & A U, A & D U, A & D U, A & D
10. Linear Programming	● Concept of linear programming ● Graphical presentation for optimization/ corner point method		U & A U & A
PART B: STATISTICS			
11. Data and Information	● Introduction ● Characteristics of good information ● Collection of data ● Data type ● Tables ● Charts ● Frequency distribution ● Graphical presentation of grouped and ungrouped data	5	U U U U A A A A & D
12. Measures of Location	● Arithmetic mean ● Geometric mean ● Harmonic mean ● Mode ● Median ● Partition values – Quartiles – Deciles – Percentiles	10	U & A U & A U & A U & A U, A & D A

13. Measures of Dispersion/ Measures of Shape of Distribution	● Range		U & A
	● Mean deviation		U & A
	● Quartile deviation/ semi quartile range		U & A
	● Variance and standard deviation		U & A
	● Relative measures of dispersion		U, A & D
	● Skewness (excluding from the method of moments)		A & D
14. Correlation and Linear Regression/ Time Series (Secular Trend)	● Correlation		A & D
	● Correlation coefficient and coefficient of determination		U & A
	● Spearman's rank correlation coefficient		A & D
	● Lines of best fit		A & D
	● Scatter graph method		U, A & D
	● Linear regression analysis		U
	● Freehand curve, semi-average, moving average and least square	10	A & D
15. Index numbers	● Basic terminology		U
	● Index relatives		U & A
	● Composite price index		A & D
	● Special weighted index numbers and methods		U, A & D
	– Laspeyres		
	– Paasche		
	– MarshallEdgeworth		
	– Fisher		
	● Retail price index for Pakistan		A
	● Purchasing power of rupee		A & D
16. Probability Theory	● Concept of probability		U & A
	● Sets and sets operation	10	U & A
	● Counting techniques		U & A
	● Rules of probability (additive, multiplicative, marginal and conditional)		A
17. Probability Distributions	● Normal distribution		U, A & D
	● Binominal distribution		U & A
	● Poisson distribution		U & A
	● Hypergeometric distribution		A
18. Statistical Inference	● Sampling methods (random and non-random sampling)		A
	● Kinds of random sampling		U
	– Simple random sampling		
	– Stratified sampling (introduction only)		
	– Systematic sampling (introduction only)		
	– Cluster sampling (introduction only)		
	– Multistage/ Multi phase (introduction only)	15	
	● Concepts of sample size		U & A
	● Estimation confidence intervals for single population mean and proportion		U & A
	● Testing of hypothesis for single population mean and proportion		U & A
	● Chi-square test (test of independence only)		U & A
TOTAL WEIGHTAGE		**100**	

NOTE:-

U = Understanding

A = Application

D = Decision