

Stage: Formation 1

Subject Title: Business Mathematics and Quantitative Methods

Examination Duration: 3 Hours

Aim

The aim of this subject is to ensure that students acquire, understand and apply quantitative techniques that are used in business decision-making. They develop the ability to interpret the information obtained and present this information in a manner appropriate to a business environment.

Business Mathematics and Quantitative Methods as an Integral Part of the Syllabus

This is an essential foundation subject for the professional accountant. It develops the mathematical and statistical competence necessary to facilitate students' progression through the Formation and Professional Level examinations in subjects such as *Financial Accounting, Corporate Reporting, Advanced Corporate Reporting, Management Accounting, Managerial Finance, Strategic Corporate Finance and Strategic Performance Management*.

Stage	Subject	Subject	Subject	Subject	Subject	Subject
P2	Strategic Corporate Finance	Strategic Performance Management	Advanced Corporate Reporting	Strategy & Leadership	Audit Practice and Assurance Services	Advanced Taxation
P1		Managerial Finance	Corporate Reporting	Corporate Laws and Governance	Auditing	
F2		Management Accounting	Financial Accounting	Information Systems	Taxation	
F1		Business Mathematics & Quantitative Methods	Economics & The Business Environment	Business Laws		

The above table shows the linkages between *Business Mathematics and Quantitative Methods* and the subjects highlighted. The capabilities developed will be built upon in the study of the subjects highlighted above.

Learning Outcomes

On successful completion of this subject students should be able to:

- Demonstrate the use of financial mathematics, measures of central tendency/dispersion and indices in business.
- Display information in a graphical/tabular form including frequency distributions, networks, etc.
- Demonstrate the use of probability and confidence intervals in business.
- Explain the concept of present value and apply discounting techniques in investment appraisal.
- Apply moving averages and regression analysis in forecasting.

Syllabus

1: INTRODUCTION TO FINANCIAL MATHEMATICS

- Simple and compound interest, annual percentage rate, (APR), depreciation (straight line and reducing balance), discounting, present value and investment appraisal, annuities, mortgages, amortization, sinking funds. 2
- Handling formulae, use of positive and negative numbers, brackets and powers. 2
- Linear and quadratic equations and graphs; costs (fixed and variable), break-even analysis, revenue and profit functions and their interpretation. 2

CL*

2: SOURCES OF DATA, PRESENTATION AND USE

- Sources, nature, appreciation and precautions in use. 2
- Role of statistics in business analysis and decision-making. 2
- Presentation of data, use of bar charts, histograms, pie charts, graphs, tables, frequency distributions, cumulative distributions, ogives and their use and interpretation. 2

*CL: Competency Level

3: MEASURES OF CENTRAL TENDENCY AND DISPERSION

- Averages and variations for grouped and ungrouped data. 2
- Measures of location – mean, median, mode, percentiles, quartiles. 2
- Measures of dispersion – range, variance, standard deviation, co-efficient of variation. 2

4: PROBABILITY

- Meaning of probability, nature of probability distributions, discrete and continuous variables, expected values. 2
- Standard Normal Distribution, confidence intervals, z-score and associated diagrams. 2
- Use and application of probability distributions. 2

5: SAMPLING AND SAMPLING THEORY

- Sampling Methods – Simple random, stratified, cluster, systematic sampling. 2
- Interval estimation for large and small samples; confidence levels, standard error; estimate of sample size. 2
- Hypothesis testing – Null and Alternative hypothesis; description of Type I and Type II errors. 2

6: REGRESSION ANALYSIS

- Simple Linear Regression, scatter-graphs, least squares method. 2
- Co-efficient of determination, correlation co-efficient, rank correlation. 2
- Use of linear regression equation in forecasting.

7: TIME SERIES ANALYSIS

- Factors influencing time series – trend, seasonal, cyclical, irregular variations. 2
- Smoothing time series by means of moving averages. 2
- Use of time series in forecasting. 2

8: INDICES: USE AND CONSTRUCTION

- Simple, aggregate, Laspeyres, Paasche, chain indices. 2
- Change of base period, weighting. 2
- Construction, use and interpretation of indices. 2

9: NETWORK ANALYSIS

- Activity identification, Relationship between various elements, Construction of simple networks. 2
- Analysis of networks by deriving the critical and non-critical activities. 2
- Derivation and definition of the critical path. 2

Assessment Strategy

Examination Approach

This subject deals with the collection and organisation of key business facts into meaningful data and the presentation and analysis of this data into useful information. Questions are framed in a business context, with each question having a number of sub-sections. The first sub-section may require quantitative analysis while others may require qualitative analysis, that is, to provide an interpretation of the quantitative data.

Examination Format

The examination is unseen, closed book and 3 hours in duration. Students are required to answer 5 questions out of 6.

Marks Allocation

Each question carries 20 marks The total for the paper is 100 marks.

Booklist

Core Texts

- Curwin and Slater / Quantitative Methods for Business Decisions / Thomson Learning / ISBN 1861525311. 2
- Clare Morris / Quantitative Approaches in Business Studies, 6th Edition / ISBN 0273657593. 2
- Business basics: quantitative methods, 3rd. ed. / BPP / ISBN 0751721271
- Donald Waters / Quantitative Methods for Business, 3rd Edition / ISBN 027364694X. 2
- (This title is being reprinted, which may result in extended delivery times).
- For greater depth on statistics, the following is recommended: 2
- W.M. Harper / Statistics, 6th Edition / ISBN 0273634267. 2

Manuals

Griffith College CPA F1 Business Mathematics and QM

Supplementary Texts

- Les Oakshott / Essential Quantitative Methods for Business, Management and Finance, 4th Edition / Palgrave / ISBN 9780230218185.
- Lucy T. / Quantitative Techniques 6th ed. / Continuum Publications (2002) / ISBN 0826458548.
- Wisniewski M. / Quantitative Methods for Decision Makers 5th ed / Pearson 2009 / ISBN 9780273712077 / ISBN 0273712071.
- Buglear J. / Quantitative Methods for Business Elsevier (2005) / ISBN 0750658983.
- Buglear J. / Stats Means Business / Butterworth Heinemann (2001) / ISBN 0750653647.
- Soper J. / Mathematics for Economics and Business / Blackwell (2004) / ISBN 1405111275.
- AccountancyPlus.
- CPA students' eBulletin.

Useful Websites

(as at date of publication)

www.cpaireland.ie - The Institute of Certified Public Accountants in Ireland.

http://ftp7.freebsd.org/sites/home.ubalt.edu/ntsb_arsh/Business-stat/opre504.htm#rcst - Professor Hossein Arsham's, (FOR, FRSS, FWIF), Statistical Thinking for Managerial Decisions.