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BCS Professional Certificate in Data Analysis Syllabus

Version 1.2
December 2016

This professional certification is not regulated by the following United Kingdom Regulators - Ofqual, Qualification in Wales, CCEA or SQA

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Change History

Any changes made to the syllabus shall be clearly documented with a change history log. This shall include the latest version number, date of the amendment and changes made. The purpose is to identify quickly what changes have been made.

Version Number	Changes Made
Version 1.2 December 2016	Strapline regarding regulated statement has been added
Version 1.1 July 2016	Update to pass mark
Version 1.0 October 2015	Syllabus created.

Introduction

The BCS Professional Certificate in Data Analysis comprises fundamental principles, concepts and techniques used to identify, analyse and model data. The aim of this certification is to enable candidates to define data requirements with detailed understanding and rigour.

The certification examination assesses knowledge and understanding of a range of activities and techniques that may be used by business analysts to elicit and analyse data requirements and the business rules inherent in the data, and to define the structure of the data that will support the business requirements in an unambiguous fashion.

Assessment Objectives

The examination leading to the BCS Professional Certificate in Data Analysis has the following assessment objectives.

Candidates must be able to demonstrate that they can:

- Define the terms identified in the syllabus topic areas
- Explain the purpose of data analysis and modelling
- Distinguish between different types of data analysis artefact
- Identify constructs used within data models, both entity relationship and analysis class models
- Distinguish between entity types and entity occurrences; objects and classes
- Interpret data model extracts
- Evaluate conformance between data analysis artefacts and requirements
- State the business rules defined within data analysis artefacts
- Define the rules used to derive third normal form relations from unnormalised data sources
- Evaluate data sets against normalisation rules

Target Audience

This certification is relevant for anyone wishing to gain an understanding of the benefits and uses of data analysis and the techniques applied when analysing business data. In particular, the certification will be of benefit to business analysts, systems analysts, and technical or solution architects.

Eligibility for the Examination

There are no pre-requisites for sitting this examination although candidates should be prepared to be assessed in line with the objectives listed in the previous section. While not compulsory, it is recommended that candidates attend a BCS accredited training course.

Duration and Format of the Examination

The format for the examination is a 90 minute examination. It consists of 40 multiple choice questions. The examination is closed book i.e. no materials can be taken into the examination room. The pass mark is 26/40 (65%).

Additional time for candidates requiring Reasonable Adjustments

Candidates may request additional time if they require reasonable adjustments. Please refer to the reasonable adjustments policy for detailed information on how and when to apply.

Additional time for candidates whose native language is not that of the examination

If the examination is taken in a language that is not the candidate's native / official language then they are entitled to 25% extra time.

If the examination is taken in a language that is not the candidate's native / official language then they are entitled to use their own **paper** language dictionary (whose purpose is translation between the examination language and another national language) during the examination. Electronic versions of dictionaries will **not** be allowed into the examination room.

Format of the Examination

Type	40 multiple choice questions
Duration	1 Hour and 30 Minutes. Candidates are entitled to an additional 23 minutes if they are sitting an examination in a language that is not their native/official language.
Example Question	The International Standard Book Number (ISBN) uniquely identifies a book. In a library, each individual physical book is allocated an accession number to make it unique. This is because the library might hold several copies (each with a unique accession number) of the same book (so all copies of that book have the same ISBN). Library members (borrowers) are given a unique identifier (borrower number) so that an individual borrower can be uniquely identified. Borrowers may be of different types (Students, Pensioners, Teachers, etc.) with each type uniquely identified by a code (for example; P for Pensioners). Authors are also given unique identifiers (author number). Authors can write more than one book. Which of the following tables is **NOT** normalised? A. Author number, author name, author address, author date of birth B. ISBN, book title, *author number **C. Accession number, *ISBN, date purchased, book title** D. Accession number, date loaned, time loaned, *borrower number, date due back
Pre-requisites	Accredited training is strongly recommended but is not a pre-requisite
Supervised	Yes
Open Book	No
Pass Mark	26/40 (65%)
Distinction Mark	None
Calculators	Calculators cannot be used during this examination
Delivery	Paper-based examination

Syllabus

For each top-level area of the syllabus a percentage and K level is identified. The percentage is the exam coverage of that area, and the K level identifies the maximum level of knowledge that may be examined for that area.

1. Concepts and principles of data analysis and modelling (10%, K4)

1.1 Definitions of terms – data, data analysis, data model
1.2 Rationale for analysing and modelling data
1.3 Techniques used in data analysis
- Entity relationship modelling
- Analysis class modelling
- Normalisation

1.4 Approaches to data analysis and modelling
- Derived from business needs: 'top-down'
- Derived from data sources: ' bottom-up

1.5 Application of data analysis artefacts
- Business modelling
- System modelling (existing and required)
- Impact analysis
- Communication and training

2. Entity relationship modelling (40%, K4)

2.1 Content of an entity relationship model
2.2 Identification of entities and attributes
2.3 Entity types and entity occurrences
2.4 Attribute types and attribute occurrences
2.5 Simple and compound keys
2.6 Relationships
- Cardinality (1:1, 1:M, M:M)
- Optionality
- Exclusivity
- Recursion
- Naming relationships

2.7 Super-types and sub-types

3. Rationalising data (15%, K4)

3.1 Normalisation process and rules
- Unnormalised (UNF)
- First normal form (FNF)
- Second normal form (SNF)
- Third normal form (TNF)

3.2 Definition of the TNF tests
3.3 Rationalisation of TNF results from multiple data sources
3.4 Development of the TNF model

4. Analysis class modelling (25%, K4)

4.1 Objects and classes
4.2 Structure of a class: name, attributes, operations
4.3 Associates and multiplicity
4.4 Naming associations
4.5 Generalisation

5. Validation techniques (10%, K4)

5.1 Cross-referencing matrices: CRUD matrix
5.2 Data navigation paths

Levels of Knowledge / SFIA Levels / Blooms

This course will provide candidates with the levels of difficulty / knowledge skill highlighted within the following table, enabling them to develop the skills to operate at the levels of responsibility indicated. The levels of knowledge and SFIA levels are explained in on the website www.bcs.org/levels. The levels of knowledge above will enable candidates to develop the following levels of skill to be able to operate at the following levels of responsibility (as defined within the SFIA framework) within their workplace:

Level	Levels of Knowledge	Levels of Skill and Responsibility (SFIA)
K7		Set strategy, inspire and mobilise
K6	Evaluate	Initiate and influence
K5	Synthesise	Ensure and advise
K4	Analyse	Enable
K3	Apply	Apply
K2	Understand	Assist
K1	Remember	Follow

Question Weighting

Syllabus Area	Target number of questions
1 – Concepts and Principles of Data Analysis and Modelling	4 (10%)
2 – Entity Relationship Modelling	16 (40%)
3 – Rationalising Data	6 (15%)
4 – Analysis Class Modelling	10 (25%)
5 – Validation Techniques	4 (10%)
Total	**40 Questions**

Recommended Reading List

Title	Business Analysis (3rd Edition)
Author	Debbie Paul, James Cadle and Don Yeates.
Publisher	BCS, Learning and Development Limited
Publication Date	October 2014
ISBN	Paperback: ISBN-13 978-1-78017-277-4 PDF ISBN-13 978-1-78017-278-1 EPUB : ISBN-13 978-1-78017-279-8 Kindle : ISBN-13 978-1-78017-280-4

Title	Business Analysis Techniques: 72 Essential Tools for Success
Author	James Cadle, Debbie Paul and Paul Turner.
Publisher	BCS, Learning and Development Limited
Publication Date	February 2010
ISBN	9781906124236

Title	Data Modeling Essentials
Author	Graeme Simision and Graham C Witt.
Publisher	Morgan Kaufmann Publishers Inc
Publication Date	November 2004
ISBN	978 0126445510

Title	Data Modeling Made Simple: A Practical Guide for Business and IT Professionals
Author	Steve Hoberman.
Publisher	Take IT with You Series
Publication Date	August 2009
ISBN	978 0977140060

Title	Developing Information Systems
Author	James Cadle.
Publisher	BCS, Learning and Development Limited
Publication Date	September 2014
ISBN	978 1780172453

Title	Introducing Systems Development
Author	Steve Skidmore and Malcolm Eva.
Publisher	Palgrave Macmillan
Publication Date	August 2003
ISBN	978 0333973691