BCS Higher Education Qualification

Diploma

November 2020

EXAMINERS' REPORT

Database Systems

General comments
The number of candidates sitting the examination was significantly down on previous sessions. This is probably due to the pandemic. However, the results were inline with expectations. It was pleasing to see that the popularity of questions was more evenly spread than in recent sessions.

Question number: A1
Syllabus area: 1.1, 2.1. 2.2 6.1 6.2
Total marks allocated: 25
Examiners' Guidance Notes
This question was the most popular question in Section A and was attempted by a large majority of candidates. Candidates produced a good range of answers with well over half achieving a pass mark. **Overall Examiner Comments**: Mostly answered comprehensively for this level.

Question number: A2
Syllabus area: 1.1
Total marks allocated: 25
Examiners' Guidance Notes
This was a question with two distinct parts covering database configuration and architecture. The first part was generally well answered but there were a number of candidates who focused entirely on ANSI SPARC rather than the components of a three tier architecture. The topic of distributed databases was not well answered and thus proved very challenging to gain many of the 17 marks available. **Examiner Comments;** A relatively unpopular question attempted by less than half of candidates. Performance was weak and worse than expected with less than half gaining a pass mark.

Question number: A3
Syllabus area: 5.1 6.1
Total marks allocated: 25
Examiners' Guidance Notes
A fairly popular question with over half of the candidates making attempts with a good average mark. The question proved to be a good test of understanding of a range of SQL DML statements and how they are used in a practical situation. **Examiner Comments Part a)** Well answered overall. The concept of the ACID properties was properly discussed. However, for 4 marks candidates should be mindful that only the essential aspects of database transactions were necessary. **Examiner Comments Part b)** Generally well answered though many candidates thought a savepoint made changes to the database persistent rather than reflect the database state at a particular stage of the transaction. Analysis of the result was generally well answered **Examiner Comments Part c)** Generally well answered with good all round knowledge of Views. **Examiner Comments Part d)** Many candidates failed to recognise that the effect of the view was dynamic. This means any changes to the average value are "computed" in the view based on current data and thus the results returned in the `Balance – AvgSal` column should reflect the update.

Question number: B4
Syllabus area: 1,1.4.2
Total marks allocated: 25
Examiners' Guidance Notes
This question was concerned with translating a scenario to a database design (ERD or such) and to extract a set of tables. Most students identified the main entities and their attributes. Common errors were linking entities in appropriate ways and quite often the arity of the relations was incorrect (either incorrectly labelled or not considered at all). When creating the tables students did often commit to consider the needed foreign keys or in some cases put these the wrong way round (e.g. 1 customer can have many devices, so the FK needs to be in device pointing to customer and not the other way round).

Question number: B5
Syllabus area: 4.1,4.3
Total marks allocated: 25
Examiners' Guidance Notes
This question considered relational algebra and SQL. Most students did quite well on the DDL statements, with a common error having been the omission of the relevant foreign key; translations between relational algebra and SQL queries also generally worked well; with some minor problems on the precise focus of the query being the most common error (i.e. more columns were returned than asked for or the joins were not sufficiently precise). Translating to relational algebra seemed harder, with many students using projection and selection incorrectly.

Question number: B6
Syllabus area: 4.2,3,2,5.1
Total marks allocated: 25
Examiners' Guidance Notes
The definition parts in this question were generally ok, but sometimes lacked precision (a surrogate key identifies a row uniquely — actually there are other keys that do that also, so answers need to be precise!). Converting tables into 3rd NF seemed to be more challenging for students, despite being a very fundamental need in database design. Candidates often do not really know what 1st NF is (no repeating groups) and created tables in 2nd NF as 1st NF. Also, the dependencies (functional and transitive) were not always identified in an appropriate way.