

BCS Higher Education Qualification

Diploma

April 2022

EXAMINERS' REPORT

Database Systems

General comments

Questions Report:

Qu.	Comment
A1	The question covered the syllabus areas of database recovery, integrity and security. It was attempted by around half of the candidates with some excellent answers, but a large number of superficial attempts, often only addressing some of the subquestions were submitted.
a)	Most candidates were able to define a transaction; the notion of change of state could have been clearer in some answers.
b)	While most candidates were able to identify what the two concepts were, there was a lack of detail in the explanation.
c)	The concepts of authentication and authorisation have some very precise meanings; answers provided by candidates often confused the two and either explained them the wrong way round or mixed aspects of each together leading to answers that identified both as almost the same.
d)	The concept of database auditing caused many candidates problems; there were a good number of answers describing in detail the idea of using a database for financial auditing, but the ask here was to look at auditing the database itself and not how databases can be used in other audits. Where candidates answered in the right domain, they frequently failed to describe how a database audit could be planned and executed (i.e. they did not provide a strategy/ technique).
A2	This question covered concurrency control. It was attempted by just over half of the candidates. Around half of the submissions achieved pass level marks.
a)	Almost all candidates are able to define ACID and describe how each feeds into database correctness. The isolation property can reduce throughput, as it requires blocking of records to operate correctly. This was identified by many candidates, with some identifying isolation but not explaining the concept and some identifying one of the other properties without giving a clear explanation as to why they think that concept is applicable.
b)	Relatively clear and well argued answers from most candidates for the first part; however some focused away from the database problem and discussed the business matter of 'overbooking flights'. Answers to subquestion ii) were less convincing with many candidates not showing clarity of the key concepts and relatively few candidates being able to show clear examples of how the concepts manifest themselves.
c)	No comments

A3	The question covered syllabus topics on referential integrity and SQL DDL. The most popular question in Part a) of the paper, with three quarters of candidates attempting it. However, this question had a fairly low pass rate. This is a result of a combination of not answering sub questions at all and not understanding the various Normal Forms.
a)	Most candidates identified the repeating groups correctly; some managed to identify a subset of the attributes involved.
b)	Normalisation as a concept is understood by most candidates, however very often there is much less clarity in the understanding of what 1NF and 2NF entail, with focus of understanding at 3NF. Consequently, students often arrive at something close to the right answer but not necessarily attributing it at the right level. 1 st NF in particular removes repeating groups – it does not introduce any ‘new relations’ or new tables.
c) + d)	Many candidates did not answer parts c) and d). Those that did generally answered well, but could often have provided some more detail in their answers.
B4	Syllabus Area 2.1 2.2 This was a fairly popular question attempted by half of all candidates. The overall performance was poor with the lowest average mark across all questions on the paper. The main reasons are explained below.
a)	This part was answered quite well but many candidates repeated their answers in the three subparts without considering what each subpart was asking. Candidates are advised to read all parts of the question thoroughly before writing their answers.
b)	This part was poorly answered overall with many candidates unable to gain marks over the two subparts. Around half of candidates could describe the file-based approach but there were many shallow answers when describing the relationship between a scenario and the actual benefits that arise. Candidates are advised to relate a File based approach with some practical real-world examples and scenarios. The graph-based approach proved to be largely unfamiliar to most candidates, so few produced any meaningful attempts. Again, candidates should be aware of alternative approaches to data management that are becoming more important.
B5	This question covered syllabus area 1.1 3.2 and 4.2. This was a very popular question. The overall performance matched the popularity of the question contributing to the highest average mark across the paper.
a)	Mostly well answered. Marks were lost generally due to a lack of knowledge on recursive relationships subpart iv).
b)	Around half of candidates gained full marks with a solid understanding of the technique of resolving many to many relationships using an example.
c)	This part concerned database architecture in modern web based systems though the question explicitly referenced this as a three-tier architecture covering client tier/application tier and database tier. Without an explicit reference to web or more generally n-tier client server resulted in around half of candidates misreading the question as a repeat of Question B4 part a). Outcome no marks awarded!
B6	Syllabus area 3.1 4.2.

	<p>This was a popular question with a good overall performance with one of the highest average marks across the paper. It was pleasing to see the good performance as this topic has in the past returned disappointing results. Candidates seemed to have realised the popularity and the relative importance of these syllabus topics.</p>
a)	<p>There were many scrappy diagrams but most of the correct entities and relationships were present. The main weakness was that candidates missed participation (optionality) constraints, for example, when converting the rule “a publisher <i>might</i> exist but <i>might</i> not have yet published a book.” Also, it is recommended that candidates state the modelling notation that was used to avoid any confusion. Further, if diagrams look “scrappy” it might be worth considering drawing out a draft answer before drawing the final solution.</p>
b)	<p>This part depended on answers to part a) to some extent, though it was surprising that around half of candidates had difficulty converting/mapping an ER model into a relational model. Further marks were lost if candidates failed to populate the tables with a few records. Candidates should consider this as important as it can be helpful in checking if the resultant relational model works!</p>