BCS Higher Education Qualification

Diploma

October 2024

EXAMINERS' REPORT

Database Systems

Questions Report:

A1	
	The majority of candidates attempted this question. Of those that did, almost all of passed.
	There were instances where candidates considered design questions in a general software engineering context rather than focused on databases.
	Modelling of entities and their relations is well understood, but there are challenges with identifying (or noting) the right arities on relations (e.g. 1:n when n:m should be chosen or vice versa). In addition, some notations were not within those usually used for ERD models (there were for example a few tree structures). An emphasis on understanding at least one of the normally used notations is recommended.
A2	
	Similar to A1, many candidates attempted this and managed to pass.
	There remains a recurring misunderstanding. Note, 1NF: 1st NF does not split the table into separate tables; it just removes certain aspects such as multi-valued attributes and repeating groups. Many candidates were not able to identify partial dependencies correctly.
	Another consistent error notes are the correct placement of foreign keys when defining tables. There were multiple rows in the Engines table that referred to the same Engineer, hence the FK field needs to be in the Engines table (i.e. for a 1:n relation it needs to be on the n side in the relation and not the 1 side).
A3	
	Approximately half of candidates attempted this question, with about half of those passing.
	There were instances where candidates did not attempt all sub questions. The explanations on the queries sometimes described what the code does line by line (table x is joined to table y and then a where clause asks for z to be equal to 12 ...) rather than describing what the business need/requirement/higher level specification would be (e.g. the query returns books that have been taken out 10 times). Queries that required grouping and counting where not always using these features and hence did not really answer the question.
	Issues in the answers related to the different types of joins were noted. Note, some joins return rows with NULL values where there are no proper matches in the other table. Some answers removed values which negatively impacted the overall answer. Finally, ON UPDATE type restrictions are primarily about database consistency, not about cyber security.

B4	
	This question was attempted by ¾ of learners with ¾ of these passing.

Sub questions were omitted by many candidates who did not pass. Generally, concepts where well explained, but some responses did not sufficiently link to given examples. Similarly specifics in relation to system support the answers were not always provided.

For file databases some candidates missed the advantage that they are 'low-tech' and hence can be easily used by people without special skills.

Graph databases are based on graphs (i.e. data nodes connected by edges); the key opportunity they provide is the richness of the relationship they capture – and searches are on these relationships. Graph databases are not about storing mathematical charts (such as pie charts) which are sometimes referred to as graphs in maths. |
| B5 | |
| | About half of candidates attempted this question, with about half of those passing.

The general challenge in all answers with the lack of detail and precision. When defining concepts, it is important to be precise on their meaning. For example, when deciding on privileges for database tables 'access' is not sufficient clear as you need to consider whether updates, selections and or deletions are allowed. After a security breach the first thing to do is to lock access – many candidates did not identify this as an option. Some responses repeated the same point multiple times in the same answer. |
| B6 | |
| | About half of candidates attempted this, with fewer than half of those passing the question.

Descriptions of concepts were generally sufficient; however there were limited examples of answer applying them to scenarios or placing them into context. For example, 2 phase locking was well described, as was lost update; however, very few responses explained how lost update is avoided through 2PL.

Question b) asked for a recovery procedure, not for actions to avoid machine failure.

Generally, questions that required justification in the answer were lacking. A focus on explaining *why* something needs to be done is required. |