

**BCS Higher Education Qualification**

**Diploma**

**October 2021**

**EXAMINERS' REPORT**

**Database Systems**

Qu.	Comment
A1	This question was attempted by just under half of the candidates.
a)	Most candidates could explain or define the concept of data validation, but not many attempted to explain why it is important. There was also a group of candidates who assumed that data validation is about ensuring the various database integrity constraints, rather than ensuring correct data 'intake'.
b)	Many candidates either followed a theme of referential integrity or explored various ways of software testing (such as blackbox, whitebox). Those candidates that explored the correct validation checks often listed less than 6, or repeated the same checks under different names. Also, candidates spent much time explaining the checks, although in most cases much briefer explanation would have sufficed.
c)	Some candidates described the concepts of rollback, undo and redo, but did not relate the insights to the example given. Candidates who discussed the given example and explained what happens in the various cases sometimes lacked detail in their description or described the wrong actions to be taken. A small number of candidates gave very good answers with the right action, and a brief justification of what action will be taken.
d)	Answers to this part were generally the strongest in question A1, with most candidates being able to explore the details of the rollback mechanisms required, and applying these in a meaningful way in the example. Sometimes explanations were ambiguous; some considered the theoretical concepts, but did not apply or relate these to the given scenario.
Qu.	Comment
A2	The majority of candidates answered this question.
a)	The concept of privilege was generally well understood and clearly articulated. Some students did answer with a more societal notion of privilege (being someone 'better', e.g. the CEO), rather than considering that this is a purely technical concept in databases.
b)	Again, the concept of role was generally well understood, however many candidates failed to explain how it helps in managing database security.
c)	Answers here either explained convincingly what a view is, or failed to understand the concept. How a view can be used to provide row level security was not answered by many, but those who did could, clearly related the two.

d)	The simple answer here would be a revoke statement, which a good number of candidates realised. However, there were also some other explorations ranging from needing passwords, to expelling users from the database.
e)	Most candidates mentioned passwords or biometrics, but rather than broadening out towards the various methods, answers then continued to explore in great detail what a password is or how biometrics work. Some candidates also distinguished physical security and logical security, and explored the more physical dimension of access.
f)	Most candidates could explain the need to store backups away from the site and many also explored that backups need to be protected. A very small number of candidates realised that backups should be encrypted, while a larger number explored that backups needed to be protected from the elements with extensive elaborations on humidity and flooding risks – which were not needed here.
A3	This questions was attempted by the majority of candidates and generally answers were good.
a)	Almost all candidates could explain the concepts well and linked these to the relevant database design features such as keys. Referential integrity could sometimes have been explained more clearly, especially correctly detailing the link between the tables and the fact that the foreign key can be null or must point to a valid entry in the parent table.
b)	The requirement here was the need for the key and not how the key is defined – many candidates explained how a key is defined in SQL, but very few could express clearly that the need for the key is given by the application domain.
c)	This part generally had the strongest answers. A common error was omitting the ‘references’ part in the foreign key definition.
d)	Answers generally explored the query in stages and described what the interim results were, with many candidates arriving at the correct answer. Some answers explored the queries, but did not relate the query to the given table.

<b>B4</b>	Some candidates appeared to struggle in part b).
<b>Syllabus</b>	section 2 1 2.2
a)	Most candidates understood the concepts associated with Data Independence and the benefits that it brings.
b)	This part required some knowledge of how data is physically accessed and to a lesser extent how data is physically stored for three different approaches namely Files; Relational Databases and Object Oriented Databases. This question may have been misread by candidates. Candidates did not seem to appreciate the consequence of a lack of physical data independence in a file based and object oriented approaches. Instead many candidates produced vague and irrelevant responses that gained few marks.

<b>B5</b>	General. This was a popular question but candidates appeared to find this question difficult.
<b>Syllabus</b>	1.1, 3.1
a)	This first part required an understanding of the overall design steps in designing a database from scratch given a requirements spec. There were a varied set of answers with some candidates understanding the key stages undertaken, but many candidates mistakenly described a standard Software process driven approach. Candidates are expected to be familiar with data driven design approaches.
b)	This part required knowledge of data modelling concepts. Generally, candidates performed the best in this part of the question. However, there was a lack of knowledge of redundant relationship, and to a lesser extent a recursive relationship. It was very important to provide clear examples of each concept to confirm understanding.
c)	Many candidates struggled with this part of the question. Some candidates seem to assume that table and database partitioning were somehow distinct and not the same concept. Examples of partitioning were expected to show that candidates understood the practical outcomes of both vertical and horizontal partitioning.
<b>B6</b>	This question required candidates to produce an ER model given a set of rules or constraints. Candidates were then required to translate the ER model into Tables.
<b>Syllabus</b>	3.1, 3.2 4.1
a)	<p>It appears that candidates would benefit from revising this topic as many struggled with this question. The main problem that candidates have with ER modelling seems to be distinguishing entity types from attributes and identifying relationships between entities.</p> <p>The examiner encourages candidates to get more practice in ER modelling, as this will develop the necessary skills needed to answer this type of question.</p>
b)	This part depended to a large extent in getting the ER model in a reasonable state.