

BCS Higher Education Qualification

Diploma

October 2022

EXAMINERS' REPORT TEMPLATE

Database Systems

Questions Report:

A1	This question covered syllabus topic 2.2
	All parts of this question were covered relatively well. Most candidates were able to recall the basic principles of data independence and the benefits of a centralised database approach. But there were many shallow answers, not fully explaining the real benefits specific to the scenario. Indeed the best answers were from those candidates who could broaden out their answers to the limitations and weaknesses of the spreadsheet approach rather than recall a lot of factual information some was not pertinent to the scenario. Only a few candidates gave the output, most appearing to not answer this part of the question.
A2	This question covered syllabus topic 5.1
	This question was relatively unpopular with a mostly disappointing overall performance amongst candidates. This question was mainly about writing SQL code statements that satisfied some requirement. The examiner was surprised by the lack of SQL knowledge in even the basic SELECT FROM WHERE structure to a query. Very few candidates could understand how to use GROUP BY on a set of values. Many candidates mistook a GROUP BY with an ORDER BY because they didn't realise the need for an aggregate function (such as MAX, COUNT SUM). Candidates need to practice their SQL skills much more by writing and testing SQL code using the many websites that support on-line interactive SQL terminals. There was a general understanding of VIEWS but a lack of understanding of how they were applied in practice. Also many candidates provided no answers to part e) where some basic knowledge of stored procedures was required.
A3	This question covered syllabus topic 6.1 and 6.2
	This was a popular question with a broad range of performance by candidates. Part a) was answered very well in general but part b) (i) (ii) candidates lost marks because they misread the question. This part specified the three tier web database architecture in which the DBMS is located in its own tier usually on a separate physical server/computer than the other tiers that support deployment on the web. Unfortunately despite the guidance candidates misread the question as ANSI-SPARC which concerns three (Conceptual/logical/physical) independent data layers covered to some extent what was asked in question1. The advice here is that candidates read the question clearly particularly the guidance before jumping in and answering the question. The last part, part b)iii, produced varied responses, with many answers repeated the same comments regarding confidentiality and authentication which are related but require distinct responses. Many candidates could not associate data integrity with security and safety instead candidates simply recalled general structural concepts of data integrity such as referential integrity. The concept of security and safety depends on relying on adequate data integrity measures in place to ensure and preserve the validity and accuracy of data

B4	This question covered syllabus topics 4.1 and 4.2
	All questions in part B were similarly popular with around ¾ of candidates answering each question. Candidates generally showed a good awareness of normal forms and the process of converting tables into higher normal forms. However a very common mistake was to confuse UNF and 1 st NF and also 2 nd and 3 rd NF. Advice to candidates would be to understand what 1 st NF looks like and then work from there. Writing of SQL DDLs was generally done well, but there have been some problems with candidates omitting key definitions or embedding foreign keys the wrong way round. Anomalies, as asked for in part D, seemed the biggest struggle for candidates, especially when it came to showing how SQL allows to address the matter.
B5	This question covered syllabus topic 1.1
	Again about ¾ of candidates attempted this question but generally very few providing good answers. For part a) the definitions were generally clear with good examples apart from the last part that focused on functional dependencies. It would be advisable for candidates to consider the concept of dependencies in a more theoretical approach seeking the smallest possible example to understand the concept. Considering the concept of data independence in part b), students either understood and explained well that this relates to the physical and conceptual layers or discussed normalisation as a process. Part c), looked at the relation between SQL and relational algebra and was reasonably well answered with mistakes often being in the detailed attention, such as identifying the fields that were needed for an operator. The largest challenge seemed to be the outer join concept in Part d), where many candidates did not realise that a full outer join returns all rows independent of whether they have matching values; also some answer tables contained more attributes than the query specified. On the latter questions candidates needed to work more carefully and ensure that attention is given to detail and not just the high level ideas – candidates should understand which attributes are involved and how they are connected together.
B6	
	¾ of candidates answered this question and generally showed a very good understanding of designing databases at the conceptual level. The biggest challenge seemed to be in working with n:m relationships; it was not always identified and when converting to a table structure there is a need to create an interim table to reflect the relationship. Also, some candidates managed to get the 1:m relationships inserted the wrong way round in the table mapping in part b) – in the example where a band has many members but each member can only be in one band the foreign key is needed in the member table pointing to band and not in the band table pointing to the member. The latter would require a multivalued entry in the band table to allow to point to all members..

Additional Examiner comments:

Candidates must read questions fully and read any guidance about answering the question thoroughly as this year there are cases of candidates misreading a question, despite having guidance, resulting in lost marks and wasting valuable time. Candidates do need to get as much practical experience of database concepts in particular SQL as this is really the only way to get more fluent to coding and testing SQL statements. There are a number of free on-line web sites that support this aspect of learning such as W3C and OracleLive.