

BCS Higher Education Qualification

Professional Graduate Diploma

October 2022

EXAMINERS' REPORT TEMPLATE

Advanced Database Management Systems

Questions Report:

A1	The question covered syllabus on concurrency control and failure management
	A popular question with around ¾ of candidates approaching it, usually to a good standard. Questions to part a) sometimes only focused on one of the approaches rather than covering both optimistic and pessimistic control. Also some answers described each to be almost identical and thus did not highlight the differences. Overall I suggest to read question carefully and answer all points mentioned in the question.
A2	The question covered syllabus on OO Data models
	Question 2 considered topics related to object oriented data modelling and the link between OO and DBS. Many candidates avoided this question, with only about 20% attempting it. Students generally seemed to find topics that go beyond relational databases challenging and this was no exception here with answers often not fitting the topic of the question. My recommendation to candidates would be to ensure that they are familiar with topics that stretch beyond RDBMS as today's applications often need embedding of databases into applications through programming (and hence candidates would encounter a mix of notations in the requirements specifications) and also because we are seeing a growth and use of no-SQL databases in everyday practice.
A3	The question covered syllabus on Data warehousing
	This question was answered by ¾ of candidates and was generally answered to a good standard, maybe in place lacking detail in the answer or answers being repetitive. My advice would be to consider the points being made and avoiding stating the same aspect in different words repeatedly. I would also advise to read the question carefully and focus on answering all aspects (e.g. in the first question some candidates would only consider one or 2 aspects of those mentioned in the question or would only consider the warehouse approach but not the OLTP approach).
B4	syllabus topics 2.4 3.1 and 4.1
	This question covered three different syllabus topics. Parts a and b were related to tuning a database to optimise performance. Resourcing hardware issues was well covered by most candidates and some of the more obvious remedies were reported. Relatively few candidates reported how monitoring tools could be applied to detect bottlenecks given that there may be and usually are limited resources available. Throwing money at the problem was a popular answer, rather than a more balanced or nuanced approach which gained higher marks.
	Part c) covered issues about database security. Most candidates at this level are well versed on this topic and understood how to use GRANT and REVOKE statements to enforce access control. In part c iii the use of a REVOKE statement assumed that permission had previously been granted to the specified role and therefore needed to be revoked.
	Part d) Covered the concept of RESTful Web services in which data (in JSON) is exchanged with a database. Many candidates either did not provide any answer at

	all or some candidates struggling with writing code that executed an SQL query and then iterate through the output from the query, returning a string in JSON format.
B5	Syllabus topic 2.5
	<p>Part a) covered theoretical foundations of distributed databases with regards to transparency of locality (when databases are physically distributed) and transparency of fragmentation (when data or tables are split into physically distributed into fragments).</p> <p>Most candidates understood the overall theoretical concept that a distributed database should behave like a centralised database and not affected by the way data is physically distributed and therefore transparent to the user.</p> <p>Many candidates did not report the role of a DBA of a local database.</p>
	<p>Part b) covered Two Phase Commit (2PC) a protocol that manages transactions in a distributed database. This part was covered extremely well by most candidates with a good understanding of the principles. A scenario that is covered in most textbooks was often supplied in candidates answers along with an illustration of how 2PC works.</p>
	<p>Part c) Covered a particular type of distributed database approach called replication in which most candidates had to consider the advantages and disadvantages of data replication for two distinct applications – a multiplayer game and a bank. Most candidates appreciated the different needs of these applications. The benefits of high availability and load reduction are particularly important for running a real time multiplayer game on a replicated database. Whereas availability of a local banking app is paramount but the central or coordinating server in a master slave type of data replication were amongst the few very good high scoring answers that were evident. The disadvantages were reported very well in general with a realisation of data loss would be catastrophic in a banking application and much less so in a multiplayer game.</p>