ASSIGNMENT 03

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Study material: Prescribed book chapters 9 to 16 & Tutorial Letter 102

Assignment type: Written

Submission procedure: Via myUnisa on the indicated due date on the module site

Year-mark weight: 50%

Part A is compulsory: It contributes towards the year mark.

- Submit your assignment via myUnisa by the due date. Do not be concerned if myUnisa is down on the last submission date. We are notified when this happens, and will take this type of delay into consideration.
- Provide detailed solutions to all the questions. The solutions for the questions will be sent to you in Tutorial Letter 202 and will also be available on myUnisa.
- The mark that you achieve will contribute 40% towards your year mark.

Total: 100 marks

Part A: Assignment 03 (100 marks): to be submitted

Question 1   [27]

1.1	Identify the main phases of the database lifecycle and the actions associated with each of them.	[12]
1.2	With respect to database transaction management and concurrence control, discuss the ACID test?	[8]
1.3	Discuss the relationship between DBMS performance tuning and query optimisation.	[7]

Question 2   [19]

2.1	What are the main problems associated with centralised databases that make distributed databases more desirable?	[5]
2.2	Describe the main levels of data and process distribution.	[6]
2.3	Briefly, discuss the basic business intelligence (BI) architectural components.	[8]

Question 3 [24]

3.1	Explain what big data is?	[5]
3.2	Brief discuss the "3 Vs" of big data.	[3]
3.3	What are key-value databases?	[5]
3.4	Identify some of the main innovative services that associated with Internet database connectivity	[4]
3.5	What are the data administered (DA) activities and characteristics as compared to those of the database administrator (DBA)?	[7]

Question 4 [20]

4.1	What are the main advantages and disadvantages of cloud computing services?	[14]
4.2	Explain the different types of cloud computing implementation.	[6]

Question 5 [10]

Research (not examinable) but contributes to year mark

From the prescribed textbook:

"Familiarity with database design techniques promotes understanding of current database technologies" (Coronel & Morris, 2023, p. xvi).

In view of the above quote, briefly describe the following

5.1	The fourth industrial revolution (4IR) and its main components	[5]
5.2	Data science	[3]

5.3	Open education resources (OER)	[2]

Note: Guidelines for answering Question 5

1. You should answer the question on a new page.

2. 5.1 to 5.3 should **together NOT exceed one page**. You will be penalised for every additional line beyond one page. This means that the whole of Question 5 should start on tops of a page and end on that same page.

3. Use a spacing of 1.5 and font size of 12. Any commonly used font type is acceptable.

4. You should define each concept and add extra info about it, depending on the marks awarded to the subsection.

5. You should not 'copy and paste' but rather use your own words.

6. Do not use websites as literature sources but rather published Journals or Conference papers.

7. You should cite the sources in the text.

8. You should write a Reference list at the end of your assignment, preferably in Harvard style but any other will be accepted as long as it is consistently used. See the one I have done at the end of the tutorial letter because of the quote I made at the beginning of this question.

9. Note 8 above is NOT included in the one-page limit provided in Note 2. This means that the reference list may be on a different page.

10. The minimum number of sources for each sub-question 5.1, 5.2 and 5.3 are four, two and two, respectively. However, the definition of 4IR should use at least two sources. This definition should be in one sentence. You may or may not use this for the other concepts in 5.2 and 5.3.

11. Do not use direct quotes, as I have done above, to answer any of the questions. Direct quotes can be used in academic writing, but this is to avoid 'copy and paste'

12. If Note 7 and 8 are not done, one mark will be subtracted from the total mark of Question 5.

13. Do not ask the lecturer how Notes 7 and 8 are done but rather find out. This is part of the question.

14. If there is something that is not clear, an email/announcement will be sent to all students to clarify it.

15. Question 5 contributes to this assignment, but it will NOT be examined on.

NB: During the year, an email will may be sent to you on how to access an example of an OER. You can use this to get an understanding of how OERs work.

Reference

Coronel, C. and Morris, S. (**2023**). Database System: Design, Implementation, & Management. 14th ed. Cengage learning.

Part B: Assignment 03 (self-assessment: Do not submit)

Question 1 [32]

1.1	What issues should be considered when resolving data requests in a distributed data environment?	[5]
1.2	What is data replication, and what are the three replication strategies?	[8]
1.3	What trade-offs are involved in building highly distributed data environment?	[5]
1.4	Using a single sentence, explain the role of databases in organizations. Then, explain your answer in more detail.	[7]
1.5	What is a server-side extension?	[7]

Question 2 [8]

2.1	What is the difference between metadata and metadata management?	[4]
2.2	What are the advantages of metadata management to originations?	[4]

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