

1.3 EXCHANGING DATA · 1.3.2

Transaction processing & ACID

Original practice questions · 31 marks · about 40 minutes · spec 1.3.2(f)

Instructions. Answer all questions. The number of marks is shown in brackets []. Quality of written communication is assessed in the extended-response question.

1 Total: 4 marks

This question is about database transactions.

(a) State what is meant by a *transaction*. [2]

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(b) State what the letters of **ACID** stand for. [2]

.....

2 Total: 6 marks

A bank transfer moves money from account A to account B: it subtracts from A and adds to B.

(a) Describe what is meant by *atomic* in ACID, referring to this transfer. [2]

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(b) Explain what is meant by *consistency* in this context. [2]

.....

(c) Explain what happens to the transfer if the system fails after subtracting from A but before adding to B. [2]

.....

3 Total: 4 marks

(a) Describe what is meant by a transaction being *durable*. [2]

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(b) Give one way that durability can be achieved for a completed transaction. [1]

.....

(c) State which ACID property record locking is used to ensure. [1]

Two users try to book the last seat on a flight at the same time.

- (a) Explain how record locking can be used to ensure the ACID principle of isolation here. [3]

- (b) Describe the problem that could occur if record locking were not used. [2]

- (c) Give one disadvantage of using record locking. [1]

(a) Explain, using the four ACID properties, how transaction processing keeps the shop's database reliable when many orders are processed at once and failures can occur. **[8]**

END OF QUESTIONS