

1)

a) Undo / Redo

	[inicia_transacao, T ₁]
	[ler_item, T ₁ , A]
	[ler_item, T ₁ , D]
	[escrever_item, T ₁ , D, 20, 25]
	[confirma, T ₁]
	[checkpoint]
	[inicia_transacao, T ₂]
	[ler_item, T ₂ , B]
	[escrever_item, T ₂ , B, 12, 18]
----->	[inicia_transacao, T ₄]
	[ler_item, T ₄ , D]
	[escrever_item, T ₄ , D, 25, 15]
	[inicia_transacao, T ₃]
Redo	[escrever_item, T ₃ , C, 30, 40]
	[ler_item, T ₄ , A]
	[escrever_item, T ₄ , A, 30, 20]
	[confirma, T ₄]
	[ler_item, T ₂ , D]
	[escrever_item, T ₂ , D, 15, 25] ← queda do sistema

Undo T₃, T₂

Redo T₄

A = 20 B = 12 C = 30 D = 15

b) No-Undo / Redo

[start transaction, T1]
[write, T1, A, 5, 10]
[write, T1, C, 2, 8]
[start transaction, T2]
[write, T1, D, 20, 25]
[commit, T1]
[write, T2, B, 12, 18]
[write, T2, A, 10, 22]
[start transaction, T3]
[checkpoint, T2, T3]
[write, T3, D, 25, 30]
[commit, T2]
[write, T3, C, 8, 34]
[start transaction, T4]
[write, T4, A, 22, 40]
[write, T3, D, 30, 33]
[write, T4, B, 18, 38]
[commit, T3]
[write, T4, A, 40, 55]
[commit, T4]
[start transaction, T5] ← Queda do Sistema

Redo T4, T3, T2

A = 55 B = 38 C = 34 D = 33

c) Undo / No-Redo

[start_transaction, T1]
[write, T1, D, 20]
[write, T1, C, 40]
[start_transaction, T2]
[write, T2, B, 15]
[checkpoint, T1, T2]
[start_transaction, T3]
[write, T3, B, 12]
[commit, T1]
[write, T2, A, 20]
[commit, T2]
[write, T3, C, 45]
[commit, T3]
[start_transaction, T4]
[write, T4, A, 30]
[start_transaction, T5]
[write, T4, D, 25]
[write, T5, C, 13]
[commit, T4]
[write, T5, B, 18] Queda do Sistema



Undo T5

B = 18 C = 13

2) Alternativa 2.

3) Alternativa 3.