Question 1

Option 1: Journal FS data structure updates
- ✔ Efficient use of journal space; hence faster journaling
- ✗ Individual updates are applied separately
- ✗ The journaling layer must understand FS semantics

Option 2: Journal disk block updates
- ✗ Even a small update adds a whole block to the journal
- ✔ Multiple updates to the same block can be aggregated into a single update
- ✔ The journaling layer is FS-independent (easier to implement)

Ext3 implements Option 2