1 Sleep, drugs, and the biology of behaviour – Part 2

Name: _____ Class: _____ Date: _____

Vocabulary

Write each word three times.

English	**Write it 3 times** (English)		
REM sleep			
agonist			
antagonist			
tolerance			

Recall

- You know you feel worse after a night with four hours of sleep than after eight.
- You have noticed that a second cup of coffee does less than the first.
- You know some medicines make people drowsy and others do not.

New ideas

Read these first. Each idea has a short worked example. Then do the Practice below.

■ 1 Sleep is a cycle, not a switch

Sleep runs in repeating stages. **REM sleep** is where most vivid dreaming happens, and the proportion of REM rises through the night. Losing sleep does not remove a fixed amount of rest; it removes disproportionately more of the *late* stages.

Worked example. Someone who sleeps four hours instead of eight loses far more than half their REM, because most of it comes in the second half of the night.

■ 2 How drugs act at the synapse

An **agonist** mimics or increases a neurotransmitter's effect; an **antagonist** blocks it. Both work at the synapse described in Part 1, which is why the same vocabulary explains medicines, caffeine and addictive drugs.

Worked example. A drug that occupies a receptor without activating it is an antagonist: the real neurotransmitter now has nowhere to bind.

■ 3 Tolerance and why doses rise

With repeated use the body adjusts, so the same dose produces less effect. This is **tolerance** , and it is a biological adjustment rather than a failure of willpower.

Worked example. A person who drinks coffee daily feels less alert from one cup than a person who never drinks it - the same dose, a different body.

Watch out: An agonist is not "a good drug" and an antagonist is not "a bad drug". The words describe what the molecule does at the receptor, not whether the effect is wanted.

Practice

2.1 State what REM sleep is associated with. [1]

2.2 Explain why losing half a night's sleep removes more than half the REM. [2]

2.3 Define an agonist and an antagonist. [2]

2.4 A molecule sits in a receptor without activating it. State which term applies and why. [2]

2.5 Define tolerance. [1]

2.6 Explain why tolerance is a biological finding rather than a moral one. [2]