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CRITICAL REASONING PRACTICE TEST 3

The human activity in which we spend the highest proportion of our time is sleeping. Like humans. every other animal species relies upon regular sleep; to the extent that sleep deprivation can result in death. This makes it all the more surprising that there is no unifying theory to explain why we need to sleep, or why we dream. There is actually much controversy amongst sleep researchers: on the one side are those favouring a memory-based unifying theory to explain sleep. Whereas, on the other side of the debate are those sleep researchers who believe that toxins are cleared from the brain during sleep. In fact, neuroscientific research now focuses on these two related questions: (i) What is the human brain doing whilst we sleep; and

(ii) Why did human sleep evolve? This second question is particularly puzzling, given that whenever an animal sleeps it is then at the mercy of other any animal predators out hunting. It would be an enormous advantage for any animal to not have to sleep. Regardless of the hazards whilst asleep, every single type of animal species does sleep. So sleep must therefore bestow something vital.

Over the last 3.5 billion years on Earth's, animal species have evolved their individual biological clocks in response to the alternating cycles of natural light from the sun. It makes some evolutionary sense for human brains to use the regular downtime period of sleep to refresh themselves by clearing out toxins and restoring energy levels. During the day the brain streams in data from all our senses and this huge amount of data needs to be processed at night. So sleep *probably* serves all these functions.

Question (i) addresses the physiology of the brain during sleep. There are four stages of non-REM sleep in a typical sleeping cycle, with these regular cycles repeated up to five times a night. Dreaming only occurs during the fifth stage, which is characterized by "rapid eye movements", or REM sleep.

Most adults and children, if woken during REM sleep, will report that they were dreaming. It's during this dreaming REM phase that your body is paralysed - except for the eye muscles. During REM sleep is the only time that the stress-related chemical , noradrenalin, is switched off in the brain. This allows the brain to remain calm as particularly emotional events from the day before are reprocessed. Each night, our few hours of deep sleep our brain moves our memories from short-term to long-term storage, thus freeing-up short-term memory space for tomorrow. Our memories do need to be consolidated within 24 hours of being formed, so without sufficient deep sleep, some unconsolidated memories are eventually lost.

Most REM sleep occurs in the last half of the night. Hence, the effect of feeing stressed and groggy if you're woken up in the middle of REM sleep by a sudden noise. Your brain has not yet processed all of your difficult emotions from the previous day.

Francis Crick - who with Watson discovered the double helix structure of DNA - posited that non-REM sleep was to replenish the body, whilst REM sleep was to replenish the brain. A more recent theory to explain dreaming posits that a "sleeping" brain is actually piecing together an information jigsaw of that day's events to get clarity of the picture as a whole. This theory conveniently explains the bizarre associations that occur in dreams as due to anomalous pieces of information that do not readily "fit".

If you cut back on sleep then this causes those genes firstly associated with your immune and stress responses to became more active. Secondly, increased activity in your genes which are associated with diabetes and cancer. Whereas additional sleep decreases activity in all these genes.

1) All of the following aspects of sleep are discussed by the author in their second paragraph except for which one?
a) Human sleep
b) Sleeping hazard
c) REM sleep
d) Sleep evolution
e) Predators sleeping

2) Each of the following statements can be inferred from the passage expect for which one?
a) There are unanswered questions about the reasons for sleep.
b) We spend more time working than sleeping.
c) DNA has a double-helix structure.
d) REM sleep is one of the most important sleep stages.
e) Both body and mind may be replenished during different sleep stages.

3) Which of the following is *not* characteristic of REM sleep?

a) Memory transfer
b) Events reprocessing
c) Complete paralysis
d) Lack of noradrenalin
e) Dreams

4) Which of the following possible explanations for sleep's evolution are not present in the passage?
a) It replenishes energy levels.
b) It replenishes the body and the brain.
c) It allows sense to be made of the day's events.
d) It clears the brain of toxins.
e) It keeps animals safe from predators.

5) Which of these is the best summary of the effects of cutting back on sleep?

a) There is decreased activity in those genes associated with the immune system.
b) There is increased activity in those genes associated with cancer.
c) There is increased activity in the immune system's genes and cancer-related genes.
d) Stress response genes become less active.
e) Stress response genes become more active.

6) The passage includes which one or more of the following facts about sleep?
a) Not sleeping for a few days can slowly cause someone to die from exhaustion.
b) Neuroscience has failed to answer the most basic questions about sleep.
c) Non-REM and REM sleep tend to alternate.
d) The Earth has been inhabited by animals for 3.5 billion years.
e) A typical human spends most of the 24-hour day-night cycle engaged in dreams.

7) Which word is the most suitable replacement for "anomalous" within the context of the last sentence?
a) Erroneous
b) Atypical
c) Missing
d) Anonymous
e) Allegorical
