Chapter 1: A Framework for Mind and Brain

Multiple Choice Questions (1-5)

1. Cognitive neuroscience is the study of
    a. *The mind and brain
    b. The brain and emotions
    c. The mind and development
    d. The brain and social behaviors
2. Which of the following is the best example of 'levels of analysis' when studying the brain?
    a. *A neuron in primary visual cortex, a region in primary visual cortex, the occipital lobe, and the entire human brain
    b. The frontal lobe, the temporal lobe, the occipital lobe, and the parietal lobe
    c. A man's brain, a woman's brain, a child's brain, and an ape brain
    d. All of the above
3. The three Global States are:
    a. Consciousness, unconsciousness, and comatose
    b. *Waking, sleeping and dreaming
    c. Emotional, cognitive, and analytical
    d. Newborn, child, and adult
4. The Cortical Core is:
        a. Believed to support human consciousness
        b. Made up of the cortex and the two thalami
        c. A massive hub of connectivity in the brain
        d. *All of the above

5. According to the theater analogy for the Global Workspace Theory developed by Baars:

    a. The entire theater represents unconscious processes

    b. *The spotlight on the stage represents voluntary attention

    c. The spotlight on the stage represents working memory

    d. None of the above

Short Answer Questions (1-3)

1. Describe briefly the various elements of the theater (e.g., stage, audience, backstage) used as an analogy for the Global Workspace Theory and what they are proposed to represent in human cognition.

    The theater analogy for the global workspace theory. According to this analogy, the entire theater -- stage, audience, players, and backstage areas -- form the basis of conscious and unconscious brain processes. The theater stage represents working memory. A spotlight on the stage represents voluntary attention. Only the stage contents illuminated by the attentional spotlight are conscious. The rest of the theater represents the vast unconscious store of knowledge and memories that can enter the contents of consciousness once they are on the stage and under the spotlight. A key point here is that the spotlight of attention on the stage is very limited in capacity: it represents just a small portion of the stage (working memory), which in turn represents a small portion of the vast theater (unconscious knowledge and processes).

2. Explain how the three Global States are reflected in shifting levels of awareness and wakefulness.

    For healthy individuals, our typical conscious state includes a balance of full wakefulness and awareness. As we move through the three global states of waking, sleeping, and dreaming, our level of awareness (contents of our consciousness) is coupled with our level of wakefulness. As we begin to feel sleepy, then, both the levels of awareness and wakefulness drop until we reach deep sleep where we are neither aware nor awake.

3. Briefly describe the *cortical core* and the role it plays in cognition.

    A generally-held belief, supported by mounting evidence, is that the cortical core supports human consciousness: the mighty thalamus located deep in the heart of the brain connects to nearly every region in the cortex and together the two thalami and the cortex form the cortical core, the central machinery of the brain.

The two thalami are nestled into the center of the brain and form a massive influence over the cortex and the brain in general. The thalamo-cortical core, made up of the thalami and the cortex, can almost be thought of as a single massive hub that provides the lightning fast connectivity needed for waking cognition and the modulatory influences required for shifting the brain through the stages of sleep and the states of consciousness. Together they form the target for anesthesia and, when damaged, the basis for sustained unconsciousness and vegetative states.