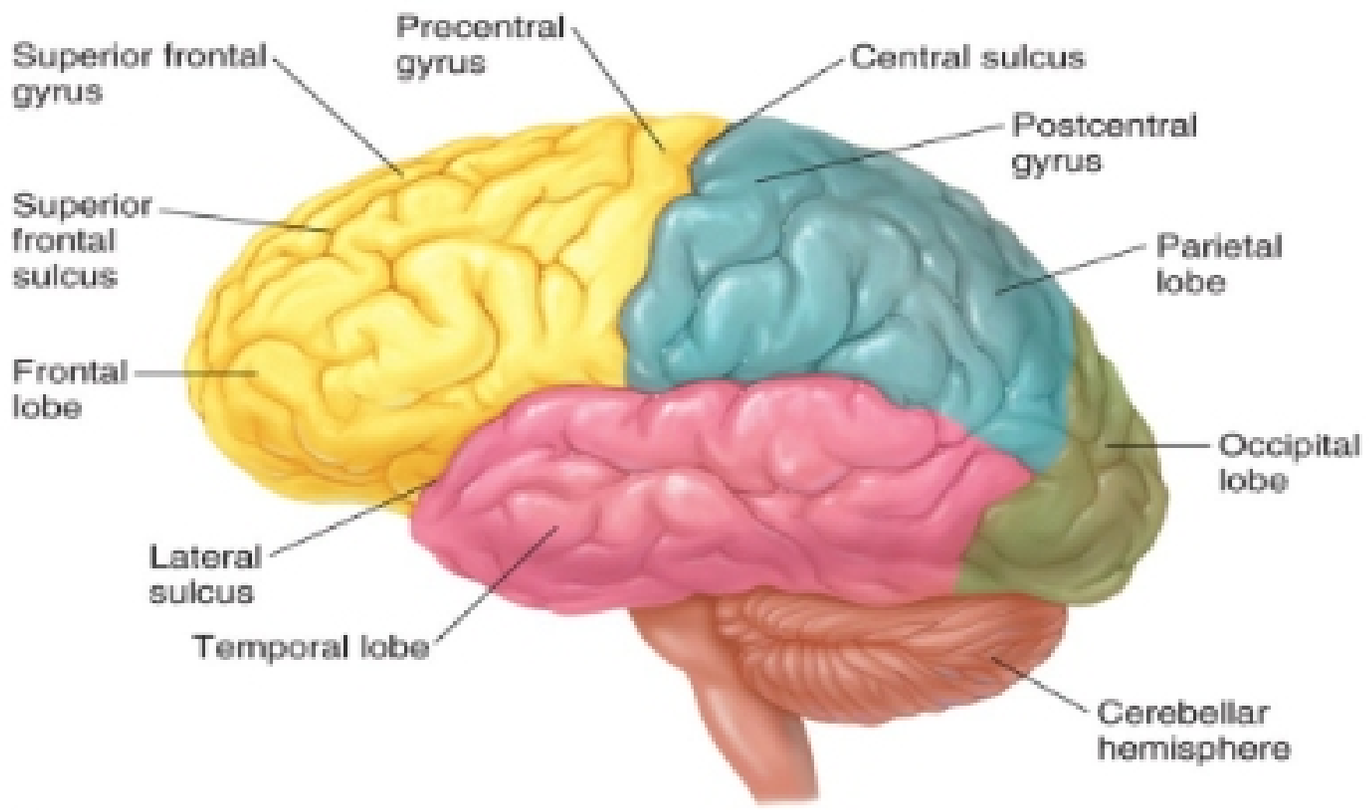
PCB3743 EXAM 2 STUDY GUIDE SP14

Chapter 8 Central Nervous System (p. 204-209, 231-235)

1. *Know the very basic anatomy of the CNS as mentioned in lecture: spinal cord, brainstem, cerebellum, cerebrum, cerebral cortex, gryus, sulcus, ventricles & CSF, spinal nerves vs. cranial nerves.*
    a. Central nervous system (CNS) - receive sensory inputs, coordinate response of the organs & functions of the body (spinal cord, brainstem, cerebellum, cerebrum)
        i. Spinal cord
            1. Ascending tracts – impulses from body receptors to brain
            2. Descending tracts – impulses from brain to body
        ii. Brainstem
            1. From top down: midbrain, pons, respiratory centers, reticular formation, medulla oblongata
                a. Medulla = center for breathing/cardiovascular responses
        iii. Cerebellum
            1. Second largest structure, controls motor system
        iv. Cerebrum
            1. Right/left hemispheres, connected by corpus callosum
        v. Cerebral cortex
            1. "bark" of the brain -- where cerebral neurons located
        vi. Gryus
            1. bulging part of wrinkle on cortex
            2. allows local connections to use shorter axons
        vii. Sulcus
            1. the valley of the fold (between the wrinkles)
        viii. Ventricles & CSF
            1. Spaces in brain and spinal cord filled with cerebral spinal fluid (CSF)
        ix. Spinal nerves
            1. Transmit motor, sensory, autonomic signals b/w spinal cord and body
            2. Ganglia – cluster of neurons
            3. Somatic nerves – motor neurons in CNS
            4. Impulses go from spinal cord to somatic motor neurons to muscles
        x. Cranial nerves
            1. Sensory/motor nerves straight to and from the brain
            2. 5 senses, balance, GI tract
            3. Nucleus – cluster of neurons

2. *Be able to point to the 4 different lobes of the cerebrum (Fox Figure 8.5a).*



(a)

a. Frontal lobe
    i. large lobe in front of brain
    ii. motor control, personality, higher intellectual proccesses
b. Parietal lobe
    i. second large lobe behind frontal lobe
    ii. somatesthetic interpretation (cutaneous/muscular sensations); understanding speech, formulating words to express thoughts and emotions; interpretation of textures/shapes
c. Temporal lobe
    i. on sides near the temples
    ii. interpret audition, auditory/visual memory
d. Occipital lobe
    i. back of head
    ii. focusing the eye, perception of vision

3. *Understand the homunculus of the motor and somatosensory cortex.*
    a. Homunculus
        i. Map of sensory input and motor output; map looks like "little person"
            1. Parts of body w/ high density of sensory input get bigger share of somatosensory cortex (hands and face)
            2. Parts of body w/ finest motor control get bigger share of motor cortex (muscles)
                a. Motor cortex
                    i. In front of central sulcus
                    ii. Neurons that initiate movement, sending axons to spinal moto neurons
                b. Somatosensory cortex
                    i. Behind central sulcus
                    ii. End of sensory information coming from skin
        ii. Sensation crosses over: felt on right side of body, sent from right side of brain
            1. Touch crosses over late but temperature/pain cross immediately
                a. Can be used to detect brain/spinal cord damage