

I Basics

- 1) Draw a simple scheme of a Neuron and mark a) Dendrit's b) Cell body c) Synapse
- 2) a) Name 2 Ions that are contributing to the resting potential in Neurons b) Which of these Ions have a net current over the membrane?
- 3) a) Make a drawing of a chemical synapse with all basic elements labeled b) ~~Describe how it~~

Describe the mechanisms of an arriving action potential and how it is transferred to the next Neuron

II

Synaptic Plasticity

- 5) Describe 2 Mechanisms how LTP is formed in the post-synaptic part
- 6) Describe the process of synapse formation during development and the influence of LTP to this process

III

Neuroanatomy

- 7) Name 3 Functions of the Hippocampus
- 8) Describe the Trisynaptic Pathway

IV Neurodevelopment

- 9) a) How are regions defined in the early neural tube, that neurons can start Neurogenesis
- b) describe and name a mechanism, how specific cells out of many precursors are chosen to become a neuron
- (his questions may have had another formulation and were a bit unclear for me)

V Motor System

10) a) What is the size principle for a motor neuron?

- b) give a biological explanation to ~~the~~ (the size principle)

11) Describe a solution, how the brain can handle the problem that sensory feedback has a delay for motor control

VI Auditory System

12) a) How and by which structure is frequency separated in the cochlea?

b) What is the connection between the

cochlea and the central auditory system? + name three important papers of this connection

VII Vision

- 13) Draw and compare the receptive field of a photoreceptor and a ganglion cell
- 14) draw a schematic retinal circuit, label the different layers and cells and the direction of incoming light.

VIII

Somatosensory system

15) What is a sensory transduction?

16) What is "active sensory"? Describe and

give ~~an~~ example, how an animal uses it

IX

Basal ganglia

17) You had a graph given with the firing rate of the striatum to ^{you should} draw the substantia nigra pars reticularis and label the SNr, the thalamus and the

the outgoing firing rates of the ~~SNr~~ SNr, the thalamus and label the ~~SNr~~ SNr, the thalamus and label the

Here, ~~all~~ were movement is initiated. - which pathway is described?

X

Prefrontal cortex

18) a) which are the three anatomical parts you can find in the pre-frontal-cortex?

b) Name three important functions of the prefrontal cortex

XI

genes and behavior

19) a) Name a system, that can be used to genetically manipulate neurons

b) Describe an example/experiment, how you could use it to get information of a protein

(his questions could have had another formulation)