What is the ion type flowing through GABA(A) receptor channels? Use the Nernst equation to compute the reversal potential for this ion type at physiological temperature (intracellular: 4mM, outside 100 mM). Draw an I-V plot and mark the reversal potential.

Which GABA receptor types do you know. Discuss the differences and similarities.

Which toxins block the GABA(A) receptors?

What happens if one of the above toxins would cross the blood – brain barrier?

Discuss the action of Benzodiapines including possible medical applications.

Explain the concept of balanced excitation and inhibition.

Discuss the difference between deactivation and desensitization.

How would you distinguish an excitatory from an inhibitory synapse in an electron micrograph?

Why do chemical synapses have mechanisms to either degrade or reuptake transmitter?

Describe the reuptake mechanisms for inhibitory synapses. Which substance inhibits this process. Suggest a medical application.

Draw an I-V plot for both the early and the late component of an excitatory current at a glutamatergic synapse. Label the I-V plots with the corresponding receptor type. Discuss the voltage-dependence in case there is any. What pharmacological manipulation would you do to separate the response mediated by the two receptor types.

Explain how an NMDA receptor is a coincidence detector of pre- and postsynaptic activity.
Why would glia cells convert glutamate into glutamine?

Discuss all the synapses involved in the stretch reflex. Specify the neurons on the pre- and postsynaptic side and the neurotransmitter(s) released.

Explain two mechanisms with which subthreshold excitatory postsynaptic potentials can make a postsynaptic cell fire an action potential.

List three pharmacological targets to treat depression. Name the corresponding pharmacological agents.

Explain how cocaine and amphetamines work (neurotransmitter system and specific targets)?