

Midterm exam topics

The midterm will be a series of questions (mostly multiple choice) on higher cognition and physiology.

The course lecture slides plus notes contain all the information you need to know

A. Questions could be asked on any of the higher cognition material (Slides and notes for lectures on 24th and 25th February).

B. Questions could be asked on the physiology material covered by lectures on March 2nd, 3rd, 4th, 10th, 11th, and 16th. However, some of this material will not attract questions. To limit the rote learning requirement, the following is a list of structures etc. about which questions could be asked.

If a structure is on the list, questions could be asked about its general form, major sources of inputs and outputs (always other structures on the list), its types of input (excitatory, inhibitory etc.) from its major sources, and indications of its functional role, including deficits following damage. Questions could also be asked about its general substructure (e.g. is it divided up into parts that communicate with each other and/or with different parts of another structure), but not the names of or details about their substructures, unless those substructures are also on the list.

You will not have to draw structures or relative location of structures in space, or identify where structures are on a diagram.

Possible question areas

Brain

- White matter
- Grey matter

Cortex

- Areas
 - Visual cortex areas
- Layers I to IV
- Columns
 - Macrocolumn
 - Column
 - Minicolumn
- Neurons
 - Pyramidal
 - Apical dendrite
 - Basal dendrite
 - Soma

- Axon
- Synapse
- Glutamate
- LTP algorithm
- Spiny stellate
- Interneuron
 - Chandelier
 - Basket cell

- EEG
 - beta band
 - gamma band
- Ventral stream
- Dorsal stream

- Hippocampal system
 - Entorhinal cortex (ERC) *¹
 - Perirhinal cortex (PRC) *¹
 - Parahippocampal cortex (PHC) *¹
 - Hippocampal formation (hippocampus proper)
 - Dentate gyrus
 - Granule cells
 - Hilus
 - Mossy cells
 - CA1
 - Pyramidal cells *¹
 - CA2
 - Pyramidal cells *¹
 - CA3
 - Pyramidal cells *¹
 - Interneurons
 - Subiculum

- Thalamus
 - dorsal thalamus
 - lateral geniculate nucleus (LGN)
 - thalamocortical neurons
 - interneurons
 - thalamic reticular nucleus (TRN) (or ventral thalamus)
 - reticular cells

- Amygdala

- Nucleus Accumbens

- Hypothalamus
 - Mammillary bodies

Basal Ganglia = Extrapyramidal system

Striatum

 Caudate nucleus

 Putamen

 Patch and matrix structure

 Spiny projection neurons

Globus pallidus

 External segment

 Internal segment

Subthalamic nucleus

Substantia nigra

 pars compacta

 pars reticulata

Parallel thalamus-basal ganglia-cortex paths

Cerebellum

 Cerebellar cortex

 lobes (three)

 layers

 Purkinje cell layer

 Purkinje cells

 Granular cell layer

 Granule cells

 Cerebellar nuclei (three)

Major connection paths

 Optic tract

 Fornix

 Corpus Callosum

Neurotransmitters

 GABA

 Dopamine

 GABA

 Serotonin

Neurons general

 Internal potential

 Action potential generation

 Sodium/Potassium pump

 Ion channels

*¹ further details as for cortex