

Question	Answer
What is the role of Acetylcholine (ACh)?	Used by neurons to cause voluntary muscles to contract, and other neurons to control the heartbeat. It may also be critical for normal attention, memory and sleep.
What is myasthenia gravis?	A disease characterised by fatigue and muscle weakness. It is caused by antibodies that block one type of ACh receptor.
Where are neurotransmitters synthesised?	Axon terminals
What is the main treatment of Alzheimers	Drugs which inhibit acetylcholinesterase and increase ACh in the brain. (ACh releasing neurons die in Alzheimer's patients)
What are Amino Acids?	Building blocks for proteins. Certain amino acids can also serve as neurotransmitters in the brain.
Name 2 Amino Acid Neurotransmitters which inhibit the firing of neurons	glycine and gamma-aminobutyric acid (GABA)
What is the activity of (GABA) increased by?	benzodiazepines (eg. valium) and by anticonvulsant drugs.
Name 2 Amino Acid neurotransmitters which act as excitory signals	Glutamate and asparate
What do N-methyl-d-asparate (NMDA) receptors do?	NMDA receptors have been implicated in activities ranging from learning and memory to development and specification of nerve contacts. Overstimulation of NMDA can cause nerve cell damage or cell death. This is what happens as a result of trauma or stroke
What is NMDA activated by?	Glutamate and asparate
What does the term catecholamines include?	The neurotransmitters dopamine and norepinephrine
What are the 3 principle circuits in the brain dopamine is involved in?	The circuit that regulates movement, cognition and emotion, regulation of the endocrine system
What is dopamine's role in the endocrine system?	Directs the hypothalamus to manufacture hormones and hold them in the pituitary gland for release into the bloodstream or

Axonal fibers that relay information to and from the temporal lobes	Anterior Commissure
Axonal fibers that are part of the visual system	Posterior Commissure
axonal fibers that leave the hippocampus and project to the hypothalamus or septal areas	Fornix
tissue layer that separates the 2 lateral ventricles	Septum Pellucidum
The _ is also known as the pituitary stalk.	Infundibulum
The 3 major areas of the brainstem are:	Midbrain, Pons and Medulla Oblongata
The Cerebellum functions to monitor and coordinate _.	Motor system - muscle activity
The cerebral peduncles consist of descending axons involved in _ functions. These axons are known as the _ tracts.	Motor function, Corticospinal Tracts
In the anterior area of the midbrain, the cranial nerve _ has nerve fibers that project out.	CN III - Oculomotor
In the posterior area of the midbrain, the cranial nerve _ has nerve fibers that project out.	CN IV - Trochlear
The Superior and Inferior Colliculi are located where?	In the posterior area of the midbrain.
The superior colliculi is associated with _ processing. The inferior colliculi is associated with _ processing.	Visual, Auditory
The anterior area of the Pons is home to which 4 cranial nerves?	CN V, VI, VII and VIII
The posterior area of the Pons is home to 3 cerebellar peduncles, named:	Superior, Middle and Inferior Cerebellar Peduncles

what arises from the anterior end of the neural tube	brain
what is the defect when the end of the neural tube does not close causing motor problems	spina bifida
what is the defect when the front of neural tube doesnt close causing fore brain from development and leads to death	anencephaly
When does the brain structures such as the fore, mid, hind brain are visible in the embryo (Day?)	28
when does the embryo resemble a miniature person (Day?)	49
when is sexual differentiation noticed in the embryo (Day?)	60
when does the brain kinda start looking like a brain (Day?)	100
when does the gyri and sulci form (Day?)	7 months
when does the brain look like an adult brain (Day?)	9 months
what is terms used to describe the rise of neural and glial cells from progenitor cells	neuroblast and glial blast
what type of cell can arise multipotential cells	stem cells
What is the area where neural stem cells surrounding the ventricles in adults	subventricular zone
what is the process of stem cells forming progenitor cell	Epidermal growth factor (EGF)
what is the process of a progenitor cell forming a neuroblast	Basic Fibroblast Growth Factor (bGFG)
What is the first stage of brain development	Cell birth (neuro/gliogenesis)
what is the second stage of brain development	cell migration
what makes the path for cells in cell migration	radial glial cells

How are microscopes limited?	by the wavelength of the light. Could potentially see atomic dimensions but visible wavelengths limit the maximum achievable resolution to 250nm.
What is the spatial resolution of light microscopes governed by? What about electron microscopes?	Light, duh, by light waves. Electron by wavelength of electron beam.
What are STED methods? what do they so?	Stimulated Emission Depletion, super resolution is achieved by narrowing point spread function of the diffraction disk by using a laser to precisely deactivated the outmost portion of the disc.
What is STORM?	Stochastic Optical Reconstruction Method - random switching of fluorescence of individual molecules allows individual contributions to be imaged. On, image localised, then off. MANY CYCLES.
are microelectrodes fast?	Yes, very good spatial resolution and very fast temporal resolution (sub-microsecond).
What's an example of molecular biology joining with high-res electrophysiology?	Patch-clamp electrodes.
When does excitatory synapse density increase dramatically?	in the early post-natal years. Then declines.
Where do most excitatory synapses form in development?	on Dendritic spines.
Which receptors detect dynamic and static touch?	Merkels and Ruffinis.
How many synapses does the pathway from the primary mechanoreceptors to the cortex contain?	2 synapses - in the brainstem and in the thalamus.
Does the right side of the brain represent the left or right side of the body?	Right side of brain represents left side of body, because they cross in the brainstem.
What constitutes the Somatosensory cortex?	Brodmann areas 3a, 3b, 1 and 2.
What in the world is a homunculus?	A cortical homunculus is a distorted representation of the human body, based on a neurological "map" of the areas and proportions of the human brain dedicated to processing motor functions, or sensory functions, for different parts of the body.

o Primary Motor Cortex	directs voluntary movement by controlling somatic motor neurons in the brain stem and spinal cord
o Primary Somatosensory Area	area of cortex that receives sensory input and whose area depends on the amount of sensory input received
o Basal Nuclei	subconscious control and integration of motor commands and skeletal muscle tone in coordinating learned movement patterns by relay of information from the cerebral cortex to the thalamus
o Limbic System	includes nuclei and tracts between the cerebrum, cingulate, diencephalon, and mesencephalon which establishes emotional states, links conscious functions of cortex with unconscious autonomic functions, and adds facilitates memory storage and retrieval
o Fornix	white matter connecting hippocampus with hypothalamus and mammillary bodies which control reflex movements associated with eating
• Detail the function, origin, and destination of each of the following Cranial Nerves	
o Cranial Nerve I	the Olfactory Nerve; olfactory epithelium>cribriform plate>olfactory bulbs
o CN II	the Optic Nerve; retina>diencephalon>then to occipital lobe
o CN III	the Oculomotor Nerve; Mesencephalon> Superior, inferior, medial rectus muscles, inferior oblique, levator palpebrae and intrinsic eye muscles
o CN IV	the Trochlear Nerve; Mesencephalon>Superior Oblique eye muscle
o CN VI	the Abducens Nerve; Pons> Lateral Rectus eye muscle
o CN V	the Trigeminal Nerve; Sensory component of Ophthalmic (Upper 1/3), Maxillary (Middle 1/3), and Mandibular (Lower 1/3) target Pons, while Motor component of Mandibular division from pons targets the muscle of mastication