

# Histology MCQs/Nerve Tissue

**1** What is an **axonal transport**?

- ☐ Transportation of a material inside microtubules
- ☐ Transportation of a material along microtubules
- ☐ Spreading of a signal inside axons
- ☐ Spreading of a signal along axons

**2** What is a **Bergman's glia**?

- ☐ Microglial cells in the cerebellum
- ☐ Microglial cells in the retina
- ☐ Astrocytes in the cerebellum
- ☐ Astrocytes in the retina

**3** Which type of neurons are **Betz pyramidal cells** (Betz pyramides)?

- ☐ Unipolar neurons
- ☐ Pseudounipolar neurons
- ☐ Bipolar neurons
- ☐ Multipolar neurons

**4** What is main function of the **choroid plexus**?

- ☐ Peristaltic movement of the cerebrospinal fluid
- ☐ Mechanical support of cavities inside brain
- ☐ Production of the cerebrospinal fluid
- ☐ Resorption of the cerebrospinal fluid

**5** Which cells contain **glial fibrillary acidic protein** (GFAP)?

- ☐ Oligodendrocytes
- ☐ Microglial cells
- ☐ Astrocytes
- ☐ Neurons

**6** Which intracellular structure contains **glial fibrillary acidic protein** (GFAP)?

- ☐ Intermediate filaments
- ☐ Skeleton of nucleus
- ☐ Golgi apparatus
- ☐ Microtubules

**7** Which type of nerve fibers takes place inside the peripheral nerve?

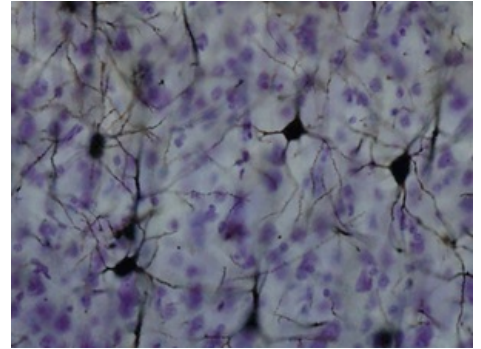
- ☐ Both myelinated and unmyelinated
- ☐ Myelinated only
- ☐ Unmyelinated only
- ☐ Mainly unmyelinated, but occasionally also myelinated

**8** Embryonic origin of **astrocytes**:

- ☐ Neural crest
- ☐ Neural tube
- ☐ Mesenchyme
- ☐ Ectoderm

**9** Embryonic origin of **microglial cells**:

- ☐ Endoderm
- ☐ Mesenchyme
- ☐ Neural tube



- ☐ Neural crest

**10** Which is embryonic origin of neurons inside the basal ganglia?

- ☐ Neural crest
- ☐ Neural tube
- ☐ Mesenchyme
- ☐ Yolk sack

**11** Which type of capillaries is part of the blood-brain barrier?

- ☐ Fenestrated capillaries with continuous basement membrane
- ☐ Fenestrated capillaries with non-continuous basement membrane
- ☐ Non-fenestrated capillaries
- ☐ Sinusoids

**12** How many layers does have the **cortex of the cerebellum**?

- ☐ Exactly three
- ☐ Two or three
- ☐ Three or four
- ☐ Two to four

**13** Ependymal cells:

- ☐ Form covering layer of the cavities inside CNS
- ☐ Apical pole is smooth, without projections
- ☐ Produce huge amount of endogenous opioids
- ☐ Are tall columnar cells

**14** Is it possible to prove the myelin using immunohistochemistry?

- ☐ Yes, it is, but we have to pretreat the specimen with the chloroform (trichloromethane)
- ☐ Yes, but for specimens harvested from the peripheral nerve system
- ☐ Yes, it is, e.g., using the myelin basic protein
- ☐ No, it is not possible

**15** What **is not true** for neurons?

- ☐ They have plenty of microtubules inside the axon
- ☐ They are rich on the rough endoplasmic reticulum
- ☐ They have strongly eosinophilic cytoplasm
- ☐ They have conspicuous nucleolus

**16** Which type of cells produces **myelin sheath**?

- ☐ Either oligodendrocytes or Schwann cells
- ☐ Oligodendrocytes only
- ☐ Schwann cells only
- ☐ Neurons

**17** Staining for myelin:

- ☐ Methylene blue
- ☐ Toluidin blue
- ☐ Alcian blue
- ☐ Luxol blue

**18** Function of **satellite cells**:

- ☐ They support neurons inside the peripheral ganglia
- ☐ They support neurons inside the cerebellar cortex
- ☐ They support neurons inside the motoric cortex
- ☐ They support neurons inside the basal ganglia

**19** Neurotransmitter of a **motor plate**:

- ☐ Acetylcholine
- ☐ Norepinephrine

- ☐ Epinephrin
- ☐ The motor plate is an electric synapsis, it needs no transmitter

**20** What is main principle of the **Nissl's technique**?

- ☐ Using of an impregnation
- ☐ Using of an acidic dye
- ☐ Using of a basic dye
- ☐ Using of lectins

**21** What is a **Nissl's substance**?

- ☐ Smooth endoplasmic reticulum and rough endoplasmic reticulum
- ☐ Complex of microtubules and intermediary filaments
- ☐ Rough endoplasmic reticulum and Golgi apparatus
- ☐ Rough endoplasmic reticulum and polyribosomes

**22** Which type of connective tissue is the pia mater?

- ☐ Highly vascularized loose connective tissue
- ☐ Poorly vascularized loose connective tissue
- ☐ Highly vascularized reticular tissue
- ☐ Poorly vascularized reticular tissue

**23** Which type of ganglia takes usually place in the wall of hollow organs?

- ☐ Parasympathetic ganglia
- ☐ Somatomotoric ganglia
- ☐ Sympathetic ganglia
- ☐ There are no ganglia in the wall of hollow organs

**24** What is a **cytoarchitecture** of the brain cortex?

- ☐ Arrangement of astrocytes in the basal ganglia
- ☐ Arrangement of astrocytes in the brain cortex
- ☐ Arrangement of neurons in the basal ganglia
- ☐ Arrangement of neurons in the brain cortex

**25** What is a **myeloarchitecture** of the brain cortex?

- ☐ Arrangement of myelinated fibers in the brain cortex
- ☐ Arrangement of oligodendrocytes in the brain cortex
- ☐ Arrangement of astrocytes in the brain cortex
- ☐ Arrangement of dendrites in the brain cortex

**26** In which structure are common **pseudounipolar neurons**?

- ☐ Posterior horns of the spinal cord
- ☐ Anterior horns of the spinal cord
- ☐ Autonomic (vegetative) ganglia
- ☐ Sensory (spinal) ganglia

**27** How is called the layer of cerebellar cortex containing Purkinje cells?

- ☐ Substantia alba cerebelli
- ☐ Stratum gangliosum
- ☐ Stratum molekulare
- ☐ Stratum granulosum

**28** Purkinje cells are:

- ☐ Unipolar neurons
- ☐ Pseudounipolar neurons
- ☐ Bipolar neurons
- ☐ Multipolar neurons

**29** Saltatory movement of the action potential:

- ☐ The action potential spreads from the neuron to the neuron using electrical synapses

- ☐ The action potential jumps from the neuron to the neuron outside synapses
- ☐ The action potential occurs in the site of Schmidt-Lanterman cleft only
- ☐ The action potential occurs in the site of Ranvier node only

**30** Which structure is responsible for resorption of the cerebrospinal fluid?

- ☐ Arachnoid granulations (Pacchionian granulation)
- ☐ Lining of left and right brain ventricles
- ☐ Lining of 3rd and 4th brain ventricles
- ☐ Choroid plexus

**31** Definition of Brodmann's areas is based on:

- ☐ Gross (macroscopic) anatomy
- ☐ Myeloarchitecture
- ☐ Glioarchitecture
- ☐ Cytoarchitecture

**32** Allocortex (i.e. archicortex and paleocortex):

- ☐ Cortex has usually three layers of neurons
- ☐ Cortex has usually six layers of neurons
- ☐ Cortex has usually ten layers of neurons
- ☐ We can not distinguish layers in the cortex

**33** Which neurons are the most striking in the primary motor cortex of brain (precentral gyrus)?

- ☐ Small interneurons
- ☐ Pyramidal neurons
- ☐ Granular neurons
- ☐ The most conspicuous feature of the motor cortex is its inconspicuousness

**34** In which part of the CNS contains **mossy fibers**?

- ☐ Substantia nigra, pars reticularis
- ☐ Reticular formation
- ☐ Rhinencephalon
- ☐ Cerebellum

**35** How many layers of neurons do we usually describe in the **neocortex**?

- ☐ 3
- ☐ 6
- ☐ 9
- ☐ 12

**36** What statement about **glial cells** is not true?

- ☐ One oligodendrocyte can produce myelin sheet for several axons
- ☐ Membrane of glial cells can generate the action potential
- ☐ Fibrillary astrocytes are in the white matter
- ☐ Bergman's glia is in the cerebellum

**37** What statement about **basket cells** is not true?

- ☐ Basket cells take place inside molecular layer of cerebellar cortex
- ☐ Axons of basket cells make synapses with Purkinje cells
- ☐ Basket cells are multipolar neurons
- ☐ Basket cells are bipolar neurons

**38** Ganglia of the peripheral nerve system:

- ☐ Glia in ganglia is composed of Schwann cells only
- ☐ Glia in ganglia contains mainly astrocytes
- ☐ Glia in ganglia contains satellite cells
- ☐ There is no glia in ganglia

**39** Cranial nerves (head nerves):

- ☐ 1<sup>st</sup> head nerve is covered by meninges
- ☐ 2<sup>nd</sup> head nerve is covered by meninges
- ☐ 3<sup>rd</sup> head nerve is covered by meninges
- ☐ 7<sup>th</sup> head nerve is covered by meninges

**40** Spinal cord:

- ☐ Neurons in the gray matter are usually pseudounipolar
- ☐ There are myelinated fibers in the white matter
- ☐ Motoneurons take place in the posterior horns
- ☐ There are no interneurons in the gray matter

**41** Unmyelinated fibers:

- ☐ In the PNS, they are protected by Schwann cells
- ☐ They are in the grey matter of the CNS only
- ☐ They are in the PNS only
- ☐ They are really naked

**42** Which cells form usually the scar in the CNS?

- ☐ Oligodendrocytes
- ☐ Müller's cells
- ☐ Fibroblasts
- ☐ Astrocytes

**43** What is a **perikaryon**?

- ☐ Synonymum for a satellite cell
- ☐ Synonymum for an astrocyte
- ☐ Initial part of the axon
- ☐ Body of the neuron

**44** To which part of the cytoskeleton belongs to neurofilaments?

- ☐ Intermediate filaments
- ☐ Actin filaments
- ☐ Microfilaments
- ☐ Microtubules

**45** Which of following methods **is not appropriate** for proof of neurons?

- ☐ Immunohistochemical staining for neurofilaments
- ☐ Silver impregnation
- ☐ Nissl's technique
- ☐ Luxol blue

**46** Which structures are part of the blood-brain barrier?

- ☐ Endothelium of vessels, basal laminas, and extracellular matrix
- ☐ Endothelium of vessels, basal laminas, and glial cells
- ☐ Endothelium of vessels, basal laminas, and neurons
- ☐ Endothelium of vessels only

**47** Purkyně cell:

- ☐ Dendrites are branching in the molecular layer and are forming two-dimensional structure
- ☐ Dendrites are branching in the molecular layer and are forming three-dimensional structure
- ☐ Dendrites are branching in the granular layer and are forming two-dimensional structure
- ☐ Dendrites are branching in the granular layer and are forming three-dimensional structure

**48** Which type of neurons are Purkyně cells?

- ☐ Unipolar
- ☐ Pseudounipolar
- ☐ Bipolar
- ☐ Multipolar

**49** In which layer can be present **Betz pyramidal cells** (Betz pyramids)?

- ☐ Lamina pyramidalis interna
- ☐ Lamina pyramidalis externa
- ☐ Lamina granularis interna
- ☐ Lamina granularis externa

**50** Where takes place the **myenteric plexus** (plexus of Auerbach)?

- ☐ Gastrointestinal tract
- ☐ Respiratory tract
- ☐ Urinary tract
- ☐ Spinal cord

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