

Multiple choice answers are found at the end.

1. Type I synapses are found on the _____, while type II synapses are found on the _____.
 - A) spines or dendritic shafts of the neuron; neuron cell body
 - B) neuron cell body; spines and dendritic shafts of the neuron
 - C) axons and axon terminals; neuron cell body
 - D) neuron cell body; axons and axon terminals

2. Metabotropic receptors consist of:
 - A) complex units of membrane-spanning proteins.
 - B) a single membrane-spanning protein.
 - C) a single, non-membrane-spanning protein.
 - D) complex units of non-membrane-spanning proteins.

3. A second messenger system can:
 - A) alter ion flow through the membrane channels.
 - B) cause a series of reactions that result in the formation of new membrane ion channels.
 - C) initiate the production of new proteins.
 - D) all of the above.
 - E) a and c.

4. The neural basis of habituation:
 - A) involves calcium ion influx decrease and reduced connections.
 - B) involves calcium ion influx increase and reduced connections.
 - C) occurs postsynaptically.
 - D) b and c.

5. Many things now have been shown to cause an individual to be later diagnosed with Parkinson's or look like they have Parkinson's disease. What is not one of these things?
 - A) Loss of dopaminergic synapses
 - B) Severe influenza
 - C) Synthetic heroine and MPTP poisoning.
 - D) L-Dopa

6. Thalidomide exposure during neural tube closure was associated with a higher incidence of:
- A) Autism.
 - B) Cerebral Palsy.
 - C) Schizophrenia.
 - D) The Mumps.
7. Which of the following embryos has a forebrain, brainstem, and spinal cord?
- A) salamander
 - B) human
 - C) rabbit
 - D) b and c
 - E) all of the above
8. Progenitor cells come from:
- A) neuroblasts.
 - B) stem cells.
 - C) glioblasts.
 - D) glial cells.
9. Dendrites develop on cells:
- A) before differentiation.
 - B) before migration.
 - C) after cell maturation.
 - D) during cell maturation.
10. Myelination of the cortex is:
- A) complete at birth.
 - B) complete at 3 to 4 years of age.
 - C) not complete until approximately 18 years of age.
 - D) a continuous process throughout life.
11. The brain can cope with injury more easily during:
- A) differentiation.
 - B) cell migration.
 - C) neuron generation.
 - D) neuron maturation.

12. Abnormal brain development that results in behavioral effects:
- A) is immediately evident.
 - B) may not be evident until adolescence.
 - C) may not be evident until the brain starts to lose neurons in the third decade.
 - D) cannot be detected until autopsy.
13. In a study examining the brains of mentally retarded children, Dominique Purpura found:
- A) fewer dendrites than normal.
 - B) fewer neurons than normal.
 - C) fewer glial cells.
 - D) more glial cells.
14. Cerebral palsy is caused by:
- A) infection.
 - B) toxin exposure.
 - C) anoxia.
 - D) a genetic abnormality.
15. Drugs that are used to manage neuropsychological illness are called:
- A) prophylactic drugs.
 - B) psychoactive drugs.
 - C) mood drugs.
 - D) psychodepressant drugs.
16. The blood–brain barrier does *not* transport:
- A) glucose.
 - B) amino acids.
 - C) neurochemicals.
 - D) oxygen.
17. Nicotine (chemical found in tobacco smoke) has its effect by:
- A) competing with acetylcholine for receptor site.
 - B) inhibiting the release of acetylcholine.
 - C) blocking the GABA receptors.
 - D) activating the GABA receptors.

18. If I had an anxiety disorder I would probably take:
- A) Haldol.
 - B) Valium.
 - C) Prozac.
 - D) imipramine.
19. Drug abuse has been associated with:
- A) changes in serotonin.
 - B) changes in dopamine.
 - C) changes in acetylcholine.
 - D) all of the above.
20. It is suggested that high levels of stress can cause damage to:
- A) neurons in the hypothalamus.
 - B) neurons in the hippocampus.
 - C) neurons in the thalamus.
 - D) neurons in the amygdala.

21. What is a Hebb synapse? 1pt

When cell A repeatedly fires cell B and the connection is strengthened.

Or something like:

Learning requires the joint activation of two neurons, which increases efficiency.

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22. What is unusual about neurons in the brains of patients with schizophrenia? 1pt

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Neurons are highly disorganized (haphazard is okay too).

They are not dead, or have plaques or anything like that.

23. What happens to rats in enriched environments – Rat Disneyland - versus running in a wheel? Movie question. 2 pts

In enriched environments rats get more new synapses

In the running wheel rats get new vasculature

If they say rats get new neurons, they can have half marks – it is the wrong comparison, but okay thought.

24. Define critical period. 1pt

Developmental window where some event has a long lasting influence on the brain.

Be tough on this question. If they say sensitive period, they haven't defined it, just used a different name.

25. The developing brain requires stimulation for normal development. Explain this sentence and provide an example. 2pts

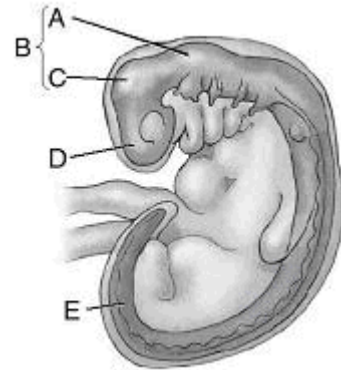
Think about the Romanian orphans p214. 1pt for the example

Studies on the severely deprived children document not only physical development delays, but developmental impairments. These included motor and cognitive impairments. 1 pt for discussion about the impairments.

Other examples can include (but must give example and idea about problem with development): Donald Hebb's studies of visual impairment – dogs raised in visually barren environment were later shown to have no reactions.

Harry Harlow's monkey studies of maternal deprivation – monkeys raised without a mother stayed with a cloth mother and not a food giving wire mother

26. Match the letter to the correct fetal brain region. 2pts



- _____ 1. Neural tube
- _____ 2. Forebrain
- _____ 3. Hindbrain
- _____ 4. Brainstem
- _____ 5. Midbrain

1. E; 2. D; 3. A; 4. B; 5. C
all 5=2, 4=1.5, 3=1, 2=.5, 1=0

27. Differentiate between agonists and antagonists. 2pts

Agonist: substance that enhances the function of a synapse

Antagonist: substance that blocks the function of a synapse

Need both to get 2 points and should be correct. Examples are not sufficient here, think about it being two definitions worth one point each.

28. Define cross-tolerance. 1pt

Response to a novel drug is reduced because of tolerance developed in response to a related drug.

29. What evidence suggests changes in cognitive behavior/function as a result of loss of estrogen or differences in hormones? 2pts

- Bird data suggests that song learning is dependent on hormones
- Men tend to excel on spatial tasks whereas women tend to excel on verbal tasks
- Performance of women differs during the course of menstruation
 - Low female sex hormones: Better spatial performance
 - High female sex hormones: Better verbal performance
- Differences between pre- and postmenopause, and during various stages of pregnancy
- Movie suggested that women had better memory function before hysterectomy than after. BUT suggested returning estrogen provided increases in memory

See p 216-217, also discussed in class and seen in movies. Note the question asks – loss of estrogen or difference in hormones. First three are examples of changes in hormones, last two are loss. A point for an example of each.

Note the question does not ask about structural changes...therefore the question should not be answered with a brain structure change. This is wrong.

30. What are endorphins? 1 pt

A naturally occurring peptide/chemical that acts like a neurotransmitter and may be associated with feelings of pain or pleasure.

31. What function do radial glial cells play in development? 1pt

The provide a pathway for developing neurons to travel on to its appropriate destination. *Points should not be provided for simply stating this is a type of glial cell – the function is what is important.*

32. How does cocaine have its action on the synapse? 2pts

Movie and class room discussion.

Cocaine attaches to the dopamine uptake pump (1point) and causes more dopamine to stay in the synapse (1 pt).

33. What factors influence drug responsiveness? 2pts

Age – older have a bigger response than younger

Sex – female have a bigger response than males

Size – smaller have a bigger response than larger.

Need all for 2 points.

With just the age, sex, size = 1 point.

Long Answer Questions: You need to answer 2 of the 3 here. 5pts each

*Please clearly indicate which question you are answering. If you use extra paper put your name on it and slide it into your exam. *

34. How does a drug enter the body, reach its target, and leave the body?

Chapter 7 question. See p. 263.

Enter – mouth (1 pt), inhalation (1pt), absorption, or injection

Reach target – must cover blood brain barrier issues (1 pt)

Leave – metabolized and broken down in the body (1pt), and excreted (1pt) through glands, feces, urine etc.

35. What are the major stages in the function of a neurotransmitter?

Chapter 5 p. 183.

1. synthesis and storage – made and stored in vesicles

2. release from axon terminal – vesicles are released into the synaptic cleft

3. action on post synaptic receptor – binds to receptor

4 inactivation - diffusion or breakdown.

Must have all four steps with detail to get full points.

Can also use a figure to show this – see p154, but picture would need some detail.

4 = 5 points, 3= 3.5 points, 2= 2.5, 1= 1.5 point

36. Distinguish between ionotropic and metabotropic receptors?

Goal question:

Ionotropic receptor: a binding site for a neurotransmitter (.5 pt) and a pore that regulates ion flow directly (1pt) to rapidly change voltage or have an impact on the cell (.5pt).

Metabotropic receptors: a binding site for a neurotransmitter (.5pt), but no pore (1pt), linked to a G protein that can affect or act with second messengers (1pt), acts more slowly than the ionotropic (.5 pt)

They could draw out some of this and get points.

Answer Key

1. A
2. B
3. D
4. A
5. D
6. A
7. E
8. B
9. D
10. C
11. C
12. B
13. A
14. C
15. B
16. C
17. A
18. B
19. B
20. B