Final Exam — Practice Test

This practice test was made by AI and there may be mistakes. If a question or answer looks wrong, use the Flag a mistake button to let Brett know so he can fix it.

1 **The resting potential of a neuron is maintained primarily by**

- **A** the sodium-potassium pump, which moves sodium ions out of the neuron and potassium ions into the neuron
- **B** sodium channels that remain permanently open in the membrane of the axon
- **C** chloride ions that are pumped into the neuron
- **D** the myelin sheath, which generates an electrical charge

Understand It with Pulse | Flag a mistake

2 **In humans, fertilization normally takes place in the**

A Fallopian tube

B Uterus

C Ovary

D Cervix

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3 **In organisms that reproduce sexually, the primary purpose of meiosis is**

A to produce genetically identical body cells

B to repair damaged chromosomes

C to produce gametes with half the chromosome number

D to double the chromosome number before fertilization

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4 **The graph shows population size over time for rabbits introduced to an island with abundant food and no predators. What is the population size after 3 years?**

- A 40
- B 80
- C 160
- D 20

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5 **After a meal, a rise in blood glucose stimulates the release of insulin. As blood glucose falls, insulin release decreases. This is an example of negative feedback because the response**

- A amplifies the original rise in blood glucose
- B permanently stops all hormone release from the pancreas
- C is carried out by the nervous system instead of hormones
- D counteracts the original change in blood glucose

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6 **The function of the epididymis is to**

- A Produce testosterone
- B Add a fructose rich fluid to semen
- C Produce sperm cells
- D Store sperm while they mature

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7 **The phase of mitosis during which sister chromatids separate and move toward opposite poles of the cell is**

- A prophase
- B metaphase
- C anaphase
- D telophase

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8 **In one year, a population of 2000 deer had 300 births, 150 deaths, 50 immigrants, and 100 emigrants. The per capita growth rate of the deer population for that year was**

A 0.025

B 0.075

C 0.05

D 0.10

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9 **Which of the following sequences correctly shows the pathway of a nerve impulse through a reflex arc?**

A receptor, motor neuron, interneuron, sensory neuron, effector

B receptor, sensory neuron, motor neuron, interneuron, effector

C effector, sensory neuron, interneuron, motor neuron, receptor

D receptor, sensory neuron, interneuron, motor neuron, effector

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10 **The main function of the placenta is to**

- **A** Mix the blood of the mother and the fetus together
- **B** Store food reserves for the developing fetus
- **C** Cushion the fetus and protect it from shocks
- **D** Allow nutrients, gases, and wastes to diffuse between maternal and fetal blood

Understand It with Pulse | Flag a mistake

11 **In snapdragons, flower colour shows incomplete dominance. A red flower (CR CR) crossed with a white flower (CW CW) produces pink offspring. When two pink snapdragons are crossed, the probability that an offspring will be white is**

- **A** 0.00
- **B** 0.50
- **C** 0.75
- **D** 0.25

Understand It with Pulse | Flag a mistake

12 **Two populations of the same wildflower species grow on opposite banks of a river. Bees carry pollen between the two populations. Over time, this movement of pollen will most likely**

A increase gene flow and decrease the genetic differences between the populations

B cause a founder effect in both populations

C cause a population bottleneck in both populations

D increase genetic drift and increase the genetic differences between the populations

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13 **The graph shows membrane potential over time during an action potential. Point A marks the threshold. What is the membrane potential at point A, in millivolts? Record your answer as a number.**

ANSWER _____

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14 **Inhibin, secreted by cells in the seminiferous tubules, normally inhibits the secretion of FSH. If a man's inhibin secretion is blocked, the expected result is**

- **A** A decrease in FSH secretion
- **B** An increase in FSH secretion
- **C** A decrease in LH secretion
- **D** A complete stop in testosterone production

Understand It with Pulse | Flag a mistake

15 **Two genes assort independently. In a cross between two double heterozygotes (AaBb × AaBb), the probability that an offspring will show the dominant phenotype for both traits is**

- **A** $\frac{1}{16}$
- **B** $\frac{9}{16}$
- **C** $\frac{3}{16}$
- **D** $\frac{6}{16}$

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16 **During a storm, a small flock of finches is blown from the mainland to an isolated island, where the finches establish a new population. The allele frequencies of the island population differ noticeably from those of the mainland population. This difference is best explained by**

A gene flow between the two populations

B genetic drift, as a result of the founder effect

C natural selection caused by predators on the island

D an increased mutation rate on the island

Understand It with Pulse | Flag a mistake

17 **The graph shows blood glucose concentration after a meal. Point A marks the highest blood glucose concentration shown. What is the blood glucose concentration at point A, in millimoles per litre? Record your answer as a number.**

ANSWER _____

Understand It with Pulse | Flag a mistake

18 **Which of the following rows correctly matches an embryonic germ layer with a structure that develops from it?**

A Endoderm - spinal cord

B Mesoderm - heart and skeletal muscles

C Ectoderm - lining of the digestive tract

D Endoderm - skin and hair

Understand It with Pulse | Flag a mistake

19 **Hemophilia is an X-linked recessive disorder. A woman whose father had hemophilia marries a man with normal blood clotting. The probability that their first child will have hemophilia, as a decimal, is**

ANSWER _____

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20 **Over one year, a population of 800 caribou had 96 births, 40 deaths, 24 immigrants, and 16 emigrants. The per capita growth rate of the population for that year was**

ANSWER _____

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21 **Some Components of a Reflex Arc 1 A motor neuron carries an impulse to a muscle 2 A sensory neuron carries an impulse toward the spinal cord 3 The muscle contracts 4 An interneuron in the spinal cord relays the impulse After a receptor detects a stimulus, the components above function in the order ____, ____, ____, and ____. Record your answer as a four-digit code.**

ANSWER _____

Understand It with Pulse | Flag a mistake

22 **During in vitro fertilization, a single cell can be removed from an embryo at the eight cell stage for genetic screening without preventing normal development. This is possible because**

A. The removed cell is replaced by meiosis in the remaining cells

B. The removed cell would have formed the placenta rather than the fetus

C. Each early embryonic cell contains a complete copy of the genome and is not yet specialized, so the remaining cells can form a complete embryo

D. The embryo does not need all of its cells until after birth

Understand It with Pulse | Flag a mistake

23 **A mutation in a gene changes a codon in the mRNA from UGU, which codes for the amino acid cysteine, to UGA, which is a stop codon. This mutation is classified as a**

A silent mutation, because the amino acid sequence is unchanged

B missense mutation, because one amino acid is replaced by another

C nonsense mutation, because translation stops early and the protein is shortened

D frameshift mutation, because the reading frame of the gene is shifted

Understand It with Pulse | Flag a mistake

24 **The graph shows heterozygous genotype frequency for different recessive allele frequencies in a population in Hardy-Weinberg equilibrium. Point A marks a recessive allele frequency of 0.6. What is the heterozygous genotype frequency at point A, expressed as a value between 0 and 1? Record your answer as a number.**

ANSWER _____

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25 **A patient complains of weight gain, fatigue, and feeling cold. Blood tests show a low level of thyroxine and a higher-than-normal level of TSH. The problem most likely originates in the**

A hypothalamus

B anterior pituitary gland

C thyroid gland

D adrenal gland

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26 **Combination birth control pills contain estrogen and progesterone. These pills prevent pregnancy mainly by**

A Physically blocking both Fallopian tubes

B Destroying sperm cells that enter the uterus

C Keeping FSH and LH levels low so that no follicle matures and ovulation does not occur

D Causing the endometrium to be shed every day

Understand It with Pulse | Flag a mistake

27 **Nondisjunction of one pair of sister chromatids occurs during meiosis II of spermatogenesis. The proportion of the sperm produced that will contain an extra chromosome is**

A 1.00

B 0.75

C 0.50

D 0.25

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28 **A closed population of 1200 elk has a per capita growth rate of -0.05 per year. The size of the elk population after one year is**

ANSWER _____

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29 **Which of the following statements about synaptic transmission is correct?**

A The nerve impulse jumps across the synaptic cleft as an electrical signal

B Synaptic vesicles travel across the cleft to the postsynaptic neuron

C Neurotransmitter molecules diffuse across the cleft and bind to receptors on the postsynaptic membrane

D Neurotransmitters are produced by the postsynaptic neuron

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30 **A woman gives birth to twins, a boy and a girl, and each twin has its own placenta. The twins most likely developed from**

A Two ova, each fertilized by a different sperm cell

B One fertilized ovum that split into two embryos

C One ovum fertilized by two sperm cells at once

D Two sperm cells that developed without ova

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31 **In pea plants, a tall plant with genotype Tt is crossed with another tall plant with genotype Tt. The genotypic ratio of the offspring is**

A 1:1

B 1:2:1

C 3:1

D 1:1:1:1

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32 **Which of the following sets of characteristics best describes a K-selected species?**

A late sexual maturity, few offspring, and prolonged parental care of young

B early sexual maturity, many offspring, and little parental care

C short lifespan, rapid growth, and many small offspring

D reproduction many times in one season with no parental care

Understand It with Pulse | Flag a mistake

33 **Immediately after the peak of an action potential, the axon membrane repolarizes. Repolarization occurs because**

- **A** voltage-gated sodium channels open and sodium ions diffuse into the neuron
- **B** the sodium-potassium pump rapidly moves sodium ions into the neuron
- **C** voltage-gated potassium channels open and potassium ions diffuse out of the neuron
- **D** synaptic vesicles release neurotransmitter from the axon terminal

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34 **The acrosome, a cap like structure covering the head of a sperm cell, has the function of**

- **A** Releasing enzymes that break down the outer layers of the ovum so the sperm can enter
- **B** Producing the energy needed to move the tail
- **C** Containing the 23 chromosomes of the sperm cell
- **D** Storing the mature sperm before ejaculation

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35 **The graph shows chromatids in a cell after the S phase of interphase for species with different diploid numbers. A frog has a diploid chromosome number of 8. The number of chromatids in a frog cell after the S phase, before mitosis, is ____. Record your answer as a number.**

ANSWER _____

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36 **A tapeworm lives in the intestine of a dog, where it absorbs nutrients from food eaten by the dog. The dog loses weight and becomes weak. This relationship is an example of**

A commensalism

B parasitism

C predation

D mutualism

Understand It with Pulse | Flag a mistake

37 **The graph shows distance travelled by an impulse along an axon over time. The speed of the impulse, in metres per second, is ____. Record your answer as a number.**

ANSWER _____

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38 **The amnion is a membrane that grows around the embryo and fills with fluid. The main role of this fluid filled sac is to**

A Supply the embryo with nutrients from the mother

B Carry oxygen from the placenta to the embryo

C Form the blood vessels of the umbilical cord

D Cushion the embryo and protect it from shocks and temperature changes

Understand It with Pulse | Flag a mistake

39 **In fruit flies, red eye colour (R) is dominant to white eye colour (r), and the gene is X-linked. A white-eyed female ($X^r X^r$) is crossed with a red-eyed male (XR Y). The probability that a daughter of this cross will be white-eyed is**

- **A** 0.25
- **B** 0.00
- **C** 0.50
- **D** 1.00

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40 **A remora fish attaches to a shark and feeds on scraps of food left by the shark; the shark is unaffected. A leech attaches to a deer and feeds on the blood of the deer. Which of the following rows identifies the relationship between the remora and the shark and the relationship between the leech and the deer?**

- **A** Remora and shark: mutualism Leech and deer: parasitism
- **B** Remora and shark: commensalism Leech and deer: parasitism
- **C** Remora and shark: commensalism Leech and deer: mutualism
- **D** Remora and shark: parasitism Leech and deer: commensalism

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41 **The region at the base of the brain that controls involuntary actions such as breathing rate, heart rate, and swallowing is the**

A medulla oblongata

B cerebrum

C cerebellum

D corpus callosum

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42 **The graph shows the number of polar bodies produced from primary oocytes. How many polar bodies are produced from 2 primary oocytes? Record your answer as a number.**

ANSWER _____

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43 **DNA fragments of different lengths are separated by gel electrophoresis. Fragments of 1200, 400, and 150 base pairs are placed in a gel and an electric current is applied. The fragment that will travel the farthest through the gel is the**

A 1200 base pair fragment

B 400 base pair fragment

C all three fragments travel the same distance

D 150 base pair fragment

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44 **Two different species of plants growing in the same field both require nitrogen from the soil. When nitrogen is in short supply, the two species are in**

A intraspecific competition

B resource partitioning

C competitive exclusion

D interspecific competition

Understand It with Pulse | Flag a mistake

45 **Insulin is secreted by**

- A beta cells in the islets of the pancreas
- B the adrenal cortex
- C the anterior pituitary gland
- D the thyroid gland

Understand It with Pulse | Flag a mistake

46 **An ectopic pregnancy is a serious condition that occurs when**

- A Two ova are fertilized in the same cycle
- B The placenta forms across the opening of the cervix
- C The blastocyst implants in the Fallopian tube instead of in the uterus
- D The zygote fails to begin cleavage after fertilization

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47 **Siamese cats have dark fur on their ears, paws, and tail, but much lighter fur on the rest of the body. The darker fur on the ears and paws is best explained by**

- **A** a mutation that occurred only in the cells of the ears and paws
- **B** extra copies of the pigment gene in the cells of the ears and paws
- **C** an enzyme that produces pigment and is active only at the cooler temperatures of the extremities
- **D** a lack of blood flow to the ears and paws during development

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48 **In a population of peacocks, females prefer to mate with males that have the largest and most colourful tails. Because of this preference, the population is not in Hardy-Weinberg equilibrium. The equilibrium condition that is violated by this preference is**

- **A** no mutations occur
- **B** mating is random
- **C** no gene flow occurs
- **D** the population is infinitely large

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49 **The structure that connects the left and right cerebral hemispheres and allows the two hemispheres to communicate with each other is the**

- A corpus callosum
- B medulla oblongata
- C meninges
- D spinal cord

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50 **The graph shows estrogen level with age. Between ages 45 and 55, the estrogen level**

- A increases
- B decreases
- C stays the same
- D increases, then decreases

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ANSWER KEY

1.	A	**18.**	B	**35.**	16
2.	A	**19.**	0.25	**36.**	B
3.	C	**20.**	0.08	**37.**	120
4.	B	**21.**	2413	**38.**	D
5.	D	**22.**	C	**39.**	B
6.	D	**23.**	C	**40.**	B
7.	C	**24.**	0.48	**41.**	A
8.	C	**25.**	C	**42.**	6
9.	D	**26.**	C	**43.**	D
10.	D	**27.**	D	**44.**	D
11.	D	**28.**	1140	**45.**	A
12.	A	**29.**	C	**46.**	C
13.	-55	**30.**	A	**47.**	C
14.	B	**31.**	B	**48.**	B
15.	B	**32.**	A	**49.**	A
16.	B	**33.**	C	**50.**	B
17.	9	**34.**	A		

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