

Practice Worksheet — Grade 12 Biology

Free practice worksheet from Enzyme. Show your work in the space provided. Stuck on any of these? Every Enzyme tutor starts with a free 20-minute call and a free diagnostic set — enzyme.ink/tutors

Hardy weinberg equilibrium

1. What is a gene pool?
 - a) all the alleles present in all the individuals of a population
 - b) the number of chromosomes in a gamete
 - c) the set of genes shared by every species in a community
 - d) all the genes in one individual organism
2. In a population of 500 beetles, 80 show the recessive phenotype. What is the frequency of the recessive phenotype, as a percentage?

Answer: _____ (%)

3. If the recessive phenotype frequency (q^2) is 0.16, what is the frequency of the recessive allele, q ?

Answer: _____

4. Which conditions must hold for a population to stay in Hardy-Weinberg equilibrium? Select all that apply.
 - a) random mating
 - b) a high mutation rate
 - c) a very large population
 - d) no natural selection
 - e) no net migration
5. Two species of paramecium grown together in one flask cannot coexist indefinitely on a single limiting resource. What principle does this illustrate?
 - a) competitive exclusion
 - b) mutualism
 - c) commensalism
 - d) primary succession

Menstrual cycle hormones

6. Which hormone triggers ovulation partway through the menstrual cycle?
 - a) a surge of luteinising hormone (LH)
 - b) a fall in follicle stimulating hormone (FSH)
 - c) a surge of progesterone
 - d) a surge of testosterone

7. What is the main role of progesterone after ovulation?
 - a) triggering the release of the egg from the follicle
 - b) maintaining the thickened uterine lining
 - c) starting the growth of a new follicle
 - d) causing menstruation to begin
8. Where does fertilisation normally take place?
 - a) in the uterus, where the embryo later implants
 - b) in the oviduct, also called the fallopian tube
 - c) in the ovary, at the moment the egg is released
 - d) in the vagina, immediately after sperm are deposited
9. Which structure allows exchange of nutrients and wastes between mother and fetus?
 - a) the amnion
 - b) the corpus luteum
 - c) the placenta
 - d) the yolk sac
10. Which of these are functions of testosterone? Select all that apply.
 - a) stimulating the growth of the uterine lining
 - b) developing male secondary sexual characteristics
 - c) maintaining the male reproductive structures
 - d) stimulating sperm production

Nerve impulse transmission

11. What is the correct order in which a nerve impulse travels through a neuron?
 - a) cell body → dendrite → axon → synapse
 - b) axon terminal → axon → dendrite → cell body
 - c) dendrite → cell body → axon → axon terminal
 - d) axon → cell body → dendrite → axon terminal
12. What maintains the resting membrane potential of about -70 mV in a neuron?
 - a) the myelin sheath generating a charge
 - b) the opening of voltage-gated sodium channels
 - c) the sodium-potassium pump moving 3 Na^+ out for every 2 K^+ in
 - d) the release of neurotransmitter into the synapse
13. What happens during depolarisation of a neuron?
 - a) the sodium-potassium pump stops working permanently
 - b) chloride ions rush out of the cell
 - c) sodium ions rush into the cell, making the inside less negative
 - d) potassium ions rush into the cell

14. What is the function of the myelin sheath?
- a) it generates the action potential at the axon hillock
 - b) it speeds conduction by making the impulse jump between nodes
 - c) it slows the impulse so the signal arrives more accurately
 - d) it releases neurotransmitters across the synapse to the next cell

Punnett squares

15. Two heterozygous parents ($Aa \times Aa$) have children. What percentage of the offspring are expected to show the recessive phenotype?

Answer: _____ (%)

16. In a cross between a heterozygous tall plant (Tt) and a short plant (tt), what percentage of offspring are expected to be tall?

Answer: _____ (%)

Transcription and translation

17. A human body cell contains 46 chromosomes. How many chromosomes are in a human gamete?

Answer: _____ (chromosomes)

18. What is the key difference between mitosis and meiosis?
- a) mitosis happens only in gametes and meiosis only in ordinary body cells
 - b) mitosis gives two identical diploid cells, meiosis four varied haploid ones
 - c) mitosis produces four varied cells and meiosis produces two identical ones
 - d) mitosis halves the chromosome number while meiosis keeps it the same
19. Crossing over during meiosis occurs at which stage?
- a) anaphase II
 - b) metaphase II
 - c) telophase I
 - d) prophase I
20. A DNA strand reads 3'-TAC GGA-5'. What is the matching mRNA sequence?
- a) 5'-UAC GGA-3'
 - b) 5'-AUG GGA-3'
 - c) 5'-ATG CCT-3'
 - d) 5'-AUG CCU-3'