

BIOL-8 Practice Test 03

Modules 8-11: Cell Division, Inheritance, Tissues, Skeletal

Instructions: This practice test covers material from Modules 8-11. Answer all questions to the best of your ability.

Part A: Multiple Choice (32 questions)

Choose the best answer for each question.

Module 8: Cell Division

1. Which phase of the cell cycle involves DNA replication? A) G1 B) S phase C) G2 D) Mitosis
2. The primary difference between mitosis and meiosis is: A) Mitosis produces somatic cells; meiosis produces gametes B) Mitosis halves the chromosome number C) Meiosis produces identical daughter cells D) Mitosis occurs only in germ cells
3. In which phase of mitosis do chromosomes line up at the cell equator? A) Prophase B) Metaphase C) Anaphase D) Telophase
4. Crossing over occurs during: A) Prophase I of Meiosis B) Metaphase II of Meiosis C) Prophase of Mitosis D) Anaphase I of Meiosis
5. If a human cell has 46 chromosomes, how many does it have after meiosis? A) 46 B) 92 C) 23 D) 12
6. Nondisjunction refers to: A) Failure of chromosomes to separate correctly B) Exchange of DNA between chromatids C) Replication of DNA D) Division of the cytoplasm
7. Cytokinesis is the division of the: A) Nucleus B) DNA C) Cytoplasm D) Mitochondria
8. Which checkpoint determines if the cell is ready to divide? A) G1 B) G2 C) M D) S

Module 9: Inheritance

9. An allele that masks the expression of another is called: A) Recessive B) Dominant C) Codominant D) Heterozygous
10. A genotype of **Bb** is described as: A) Homozygous dominant B) Homozygous recessive C) Heterozygous D) Hemizygous
11. In a cross between two heterozygotes ($Aa \times Aa$), the expected phenotypic ratio for a dominant trait is: A) 1:1 B) 3:1 C) 1:2:1 D) 9:3:3:1
12. Mendel's law of independent assortment states that: A) Alleles segregate randomly during gamete formation B) Genes on different chromosomes segregate independently C) Dominant alleles always hide recessive ones D) Gametes fuse randomly
13. Red-green color blindness is an X-linked recessive trait. A carrier mother and normal father have a son. What is the chance he is color blind? A) 0% B) 25% C) 50% D) 100%
14. Blood type AB is an example of: A) Incomplete dominance B) Codominance C) Polygenic inheritance D) Sex-linked inheritance
15. A pedigree showing a trait that appears in every generation and affects both sexes equally is likely: A) Autosomal recessive B) Autosomal dominant C) X-linked recessive D) Mitochondrial
16. If a flower shows incomplete dominance (Red \times White = Pink), a cross between two Pink flowers yields: A) All Pink B) 1 Red : 2 Pink : 1 White C) 3 Red : 1 White D) 1 Red : 1 White

Module 10: Tissues

17. Which tissue type lines body cavities and covers organs? A) Connective B) Muscle C) Nervous D) Epithelial
18. Simple squamous epithelium is adapted for: A) Protection against friction B) Rapid diffusion C) Active transport D) Contraction
19. Which connective tissue has a fluid matrix? A) Bone B) Cartilage C) Adipose D) Blood

20. The extensive extracellular matrix of connective tissue is composed of: A) Cells and organelles B) Fibers and ground substance C) Neurons and glia D) Actin and myosin
21. Skeletal muscle is characterized by being: A) Non-striated and involuntary B) Striated and involuntary C) Striated and voluntary D) Branched and involuntary
22. Which cell type supports and protects neurons? A) Glial cells B) Fibroblasts C) Adipocytes D) Chondrocytes
23. Intercalated discs are found in: A) Smooth muscle B) Skeletal muscle C) Cardiac muscle D) Dense connective tissue
24. Stratified squamous epithelium is found in the: A) Lungs B) Epidermis of the skin C) Kidney tubules D) Small intestine

Module 11: Skeletal System

25. Which is NOT a function of the skeletal system? A) Mineral storage B) Blood cell production C) Heat production D) Protection of internal organs
26. The shaft of a long bone is called the: A) Epiphysis B) Diaphysis C) Periosteum D) Endosteum
27. Osteoblasts are responsible for: A) Breaking down bone B) Forming new bone C) Sensing mechanical stress D) Producing cartilage
28. The basic structural unit of compact bone is the: A) Osteon B) Trabecula C) Lamella D) Lacuna
29. Red bone marrow produces: A) Fat B) Cartilage C) Blood cells D) Bone matrix
30. A synovial joint is characterized by: A) Being immovable B) A fluid-filled cavity consisting of a capsule C) Connecting bones with hyaline cartilage only D) Fusing bones together
31. The axis and atlas vertebrae are part of the: A) Thoracic spine B) Lumbar spine C) Cervical spine D) Sacrum

32. Which hormone increases blood calcium levels by stimulating osteoclasts? A) Calcitonin
B) Parathyroid hormone (PTH) C) Growth hormone D) Estrogen

Part B: Fill in the Blank (10 questions)

Write the correct term in the blank.

33. The division of the cytoplasm is called _____. 34. An organism with two identical alleles for a trait is _____. 35. The physical expression of a genotype is the _____. 36. _____ tissue stores fat and provides insulation. 37. The three types of muscle tissue are skeletal, cardiac, and _____. 38. _____ are the mature bone cells found in lacunae. 39. The _____ skeleton includes the skull, vertebral column, and rib cage. 40. A _____ is a chart used to track a trait through a family tree. 41. _____ dominance results in a heterozygous phenotype that is a blend of the two homozygous phenotypes. 42. Chromosomes that are not sex chromosomes are called _____.

Part C: Short Answer (5 questions)

Answer each question in 2-4 complete sentences.

43. Compare and contrast mitosis and meiosis. distinct differences in outcome.

44. Explain how a test cross can be used to determine the genotype of an organism with a dominant phenotype.

45. Describe the difference between simple and stratified epithelium and give an example of where each is found.

46. Explain the role of osteoblasts and osteoclasts in bone remodeling.

47. Define "homeostasis" and explain how the skeletal system contributes to calcium homeostasis.

End of Practice Test 03