

# Cytology Test (Introduction)

Science Olympiad Anatomy and Physiology

Name \_\_\_\_\_

Directions: *Select the best answer to each question.*

- \_\_\_\_\_ 1. What is the function of a proteasome within a eukaryotic cell?
- a. assists ribosomes in polypeptide synthesis
  - b. breaks down damaged intracellular proteins
  - c. transports nucleic acid monomers to polymerases
  - d. forms the contractile ring during cytokinesis
- \_\_\_\_\_ 2. Which of the following is not found in the nucleoplasm?
- a. chromatin
  - b. nucleotides
  - c. nucleoproteins
  - d. nucleolipids
- \_\_\_\_\_ 3. What cell membrane extensions function in absorption of extracellular materials?
- a. microvilli
  - b. filopodia
  - c. pili
  - d. both a and b
- \_\_\_\_\_ 4. Where is rRNA synthesized in the cell?
- a. nucleolus
  - b. cytosol
  - c. ribosomes
  - d. none of the above
- \_\_\_\_\_ 5. Lysosomes function in which of the following categories?
- a. manufacturing
  - b. breakdown
  - c. energy processing
  - d. communication
- \_\_\_\_\_ 6. Which of the following statements about the cell membrane is false?
- a. surface cholesterol molecules help maintain its fluidity
  - b. composed of a phospholipid bilayer with a nonpolar interior and polar exterior
  - c. embedded glycoproteins have oligosaccharide chains that function in communication
  - d. O<sub>2</sub> and CO<sub>2</sub> cross it through simple diffusion down their concentration gradients

- \_\_\_\_\_ 7. Who proposed the current fluid mosaic model of the plasma membrane?
- Singer and Nicolson
  - Watson and Crick
  - Beadle and Tatum
  - Darwin and Mendel
- \_\_\_\_\_ 8. Which of the following is not a function of lipid rafts in the cell membrane?
- organizing the assembly of signal molecules
  - sorting materials transported into the cell
  - influencing membrane protein trafficking
  - regulating neurotransmission
- \_\_\_\_\_ 9. In which of the following parts of the cell have lipid rafts also been found?
- Golgi apparatus
  - mitochondria
  - lysosomes
  - both a and c
- \_\_\_\_\_ 10. Which of the following ions would easily diffuse across the cell membrane?
- $H^+$
  - $Cl^-$
  - $PO_4^{3-}$
  - none of the above
- \_\_\_\_\_ 11. How is glucose most often transported into digestive cells?
- simple diffusion
  - facilitated diffusion
  - primary active transport
  - secondary active transport
- \_\_\_\_\_ 12. Which of the following is an occluding junction?
- adherens junction
  - gap junction
  - tight junction
  - desmosome
- \_\_\_\_\_ 13. What is the function of gap junctions?
- facilitating chemical communication between adjacent cells
  - regulating the movement of water and solutes between adjacent cells
  - holding adjacent cells to each other and the extracellular matrix
  - none of the above

- \_\_\_\_\_ 14. What is the cytoskeletal anchor for hemidesmosomes?
- a. actin filaments
  - b. microtubules
  - c. intermediate filaments
  - d. both b and c
- \_\_\_\_\_ 15. How long does a complete cell cycle usually take in a rapidly proliferating human cell?
- a. 4-6 hours
  - b. 10-12 hours
  - c. 16-18 hours
  - d. none of the above
- \_\_\_\_\_ 16. If chromatin was to condense during the G<sub>1</sub> phase of cell cycle, how many chromatids would each chromosome have?
- a. one
  - b. two
  - c. three
  - d. four
- \_\_\_\_\_ 17. What is checked for at the G<sub>2</sub>/M transition?
- a. that DNA is free of errors
  - b. that DNA replication has completed
  - c. that DNA has translated RNA
  - d. both a and b
- \_\_\_\_\_ 18. What attaches to kinetochores during mitosis?
- a. sister chromatids
  - b. daughter chromosomes
  - c. centrosomes
  - d. spindle fibers
- \_\_\_\_\_ 19. What aspect of meiosis contributes most to genetic variation?
- a. crossing over of non-sister chromatids during prophase I
  - b. homologous chromosomes being of maternal and paternal origin
  - c. two separate divisions taking place
  - d. none of the above
- \_\_\_\_\_ 20. Which of the following correctly orders the sequence of the central dogma of biology?
- a. translation → transcription → replication
  - b. transcription → translation → replication
  - c. replication → transcription → translation
  - d. replication → translation → transcription