

Cells

Required:

1. Briefly describe and give the primary function of the major organelles in the cell
2. Describe the cell membrane in detail and relate its structure to its function
3. Define and compare tight junctions, desmosomes, and gap junctions. Describe their importance in the functioning of the cell.
4. Describe and be able to distinguish among the mechanisms by which substances move through the cell membrane: diffusion, osmosis, active transport, endocytosis, and exocytosis.
5. Describe how the movement of a substance through a membrane is related to its concentration gradient
6. Explain the terms: hypertonic, hypotonic, isotonic. Be able to predict the effect of given solutions on cells
7. List the four main stages of cell respiration. List the reactants and products as well as the cellular location of each phase.
8. Contrast the two methods of ATP production in cell respiration: substrate-level phosphorylation vs. oxidative level phosphorylation. Be able to identify where all of the 30-32 ATP's are made and identify their method of production.
9. Explain the roles of NAD⁺ and FAD⁺ in cell respiration.
10. Explain the term "final hydrogen acceptors" and describe their significance in the cell respiratory process.
11. Contrast aerobic vs. anaerobic respiration.
12. Describe the process of protein synthesis(Central Dogma) by discussing the following reaction:
DNA-→(transcription)..RNA's (tRNA, mRNA, rRNA) → translation
→ polypeptide chain → protein (via coiling, folding, and transport in the golgi and ER
13. Describe the role of each type of RNA in the process of protein synthesis and discuss the importance of complimentary base pairing to the process.
14. Draw and describe the phases of mitosis

15. Sketch a diagram of the cell cycle and explain it
16. State the significance of the process of mitosis in biology
17. Define the term enzyme. Give examples of enzymes and explain how they are typically named
18. Explain the phrase enzyme specificity both structurally and functionally
19. Describe the role and importance of enzymes in metabolism and homeostasis