

Assignment: Lecture 2 Cell and tissue

1. Describe functions of the following organelle

1.1 Nucleus

1.2 Cell membrane

1.3 Mitochondria

1.4 Ribosome

1.5 Rough endoplasmic reticulum

1.6 Smooth endoplasmic reticulum

1.7 Golgi apparatus

1.8 Lysosome

2. List names of organelle which contains lipid bilayer (5 points)

3. What mode of transportation is used by the cells for small, non-polar molecules? _____

4. What mode of transportation is used by the cells for small molecules against concentration gradient? _____

5. What mode of transportation is used by the cells for large molecules? _____

6. What mode(s) of transportation across cell membrane requires channel protein? _____

7. What could be the mode of transportation of the following molecules across cell membrane (assuming that all transportation occurs following concentration gradient)?

7.1 H₂O

7.2 CO₂

7.3 Glucose

7.4 Na⁺

7.5 Proteoglycan

8. What are two types of cell division? Please briefly describe the differences between each type. (2 points)

9. Write the correct order of cell cycle phases

G1 → ___ → ___ → ___ → G1

10. A researcher observes a cell which is going to divide. It has more than single copy of genetic materials, but not as much as the double amount. No chromatin condensation is observed. What could be the cell cycle phase of this cell? _____

11. A researcher observes a cell under the microscope. The cell has visible chromosomes at the center with spindle fibers attached. Sister chromatids are still undissociated. What could be the cell cycle phase of this cell?

12. What are 2 types of cell death that could occur in our body?

12.1 _____

12.2 _____

13. What type of cell junction allows exchange of substances between cells?

14. What is the major role of tight junction? _____

15. Which type of tissue lines your respiratory tract? _____

16. Which type of tissue is the main composition of bones and joints?

17. Which type of tissue is mainly found in your brain? _____

18. Give one example of where in body which the following types of muscle will be found

18.1 Skeletal muscle _____

18.2 Cardiac muscle _____

18.3 Smooth muscle _____

19. A pathologist looks at a muscle tissue under the microscope. They found cylindrical-shaped cells with striation. Multiple nuclei are observed in a single cell. All cells are straight, no branching is observed. What could be the type of this muscle? _____
20. Cardiac muscles are responsible for contraction of the heart. The contraction occurs at all time, at the rate of around 60-100 times per minute. Each single contraction cycle of the muscle requires ATP as an energy source. Which organelle should be abundance in cardiac muscle cells? _____
21. A protein named Retinoblastoma, or Rb, is the major regulator of cell cycle. The activation of Rb protein stops the progression from G1 to S phase. If a patient has defect Rb protein which cannot be activated, what could be the result occurred in terms of cell division? _____