2A2B HUMAN BIOLOGY CELL TRANSPORT, DNA AND METABOLISM TEST

Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ /49

Part one – multiple choice

1. Osmosis is a special type of diffusion that deals with the movement of water molecules through a selectively permeable membrane from:

a) An area of low solute concentration to an area of high solute concentration.

b) An area of high solute concentration to an area of low solute concentration.

c) An area of diffusion to an area of low osmotic pressure.

d) An area inside an egg to an area outside an egg.

2. The organelle required for translation of mRNA is:

a) A ribosome.

b) The endoplasmic reticulum.

c) The nucleus.

d) Transfer RNA.

3. Select the correct pairing of phosphate bases found in DNA.

a) Uracil and cytosine.

b) Thymine and adenine.

c) Cytosine and adenine.

d) Guanine and thymine.

4. In the process of cellular respiration there is a release of:

a) glucose

b) energy

c) carbohydrates

d) oxygen

5. The following is a list of processes which may occur in a cell.

i) active transport.

ii) catabolism.

iii) respiration.

iv) osmosis.

v) anabolism.

vi) diffusion.

vii) pinocytosis.

Which processes listed above move material into, or out of, the cell?

a) iv and vi only.

b) i ,ii and v only.

c) ii, iii, v and vii only.

d) i ,iv, vi and vii only.

6. Pinocytosis is the:

a) movement of solids through a semi permeable membrane.

b) the engulfing of liquids by the cell membrane.

c) the movement of liquids out of the cell.

d) the production of pinoplasts to remove wastes from a cell.

7. How are ADP and ATP related?

a) They are identical except ADP has more energy.

b) ADP has one more phosphate group and less stored energy than ATP.

c) They are opposite processes

d) ATP has one more phosphate group and more stored energy than ADP

8. Choose the incorrect statement.

a) Most cells in your body have a nucleus.

b) Inside the nucleus are structures called chromosomes.

c) Chromosomes are tightly coiled RNA strands.

d) DNA is a chemical made up of nucleotides.

9. Enzymes lower \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to enable chemical reactions to happen at a lower temperature.

a) Cell activity.

b) Cytoplasm production.

c) Activation energy.

d) Blood pressure.

10. Select the correct definition for ‘gene’.

a) A section of DNA.

b) Tightly coiled up strand of DNA.

c) Three pairs of nucleotides attached together.

d) DNA located in the mitochondria.

11. Which of the following processes would require ATP to release one of its high-energy phosphate bonds?

i Cell division

ii Protein Synthesis

iii Diffusion

iv Phagocytosis

v Osmosis

vi Muscle contraction

a) I, ii, v & iv

b) iii, iv & v.

c) I, ii, iv &vi

d) All of the processes

12. A group of cells that are structurally alike and which perform a particular function are called:

a) A system.

b) A tissue.

c) An organ.

d) A nerve.

Part two – short answer

1. Describe two **differences** between nuclear DNA and mitochondrial DNA.

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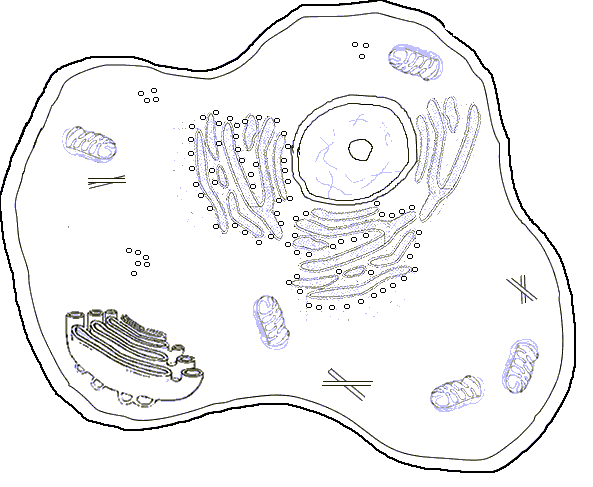
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(4 marks)

2. On the diagram of a cell below, mark in and label where cellular respiration occurs. (2 marks)

3. Fill in the table below.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Uses  oxygen? | Location/s in cell | Amount of  energy produced | Names of reaction/s  that take place. | Waste products  produced |
| Aerobic  respiration |  |  |  |  |  |
| Anaerobic  respiration |  |  |  |  |  |

(10 marks)

4. A microscope with an ocular magnification of x 10 and an objective magnification of x 10 has a field of view of 1500um. (3 marks)

a. What is the total magnification?

b. What would the new field of view be if the objective lens was changed to x 20?

5. Explain how enzymes work, draw a diagram below to help with your explanation. (4 marks)

Part three – extended answer

1. With a suitable diagram explain how the synthesis of proteins by ribosomes is controlled by DNA in the nucleus. (14 marks)

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