2A2B HUMAN BIOLOGY CELL TRANSPORT, DNA AND METABOLISM TEST

Name: ANSWER KEY Teacher: _____ /44

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. Enzymes lower _____ to enable chemical reactions to happen at a lower temperature.

a) Cell activity.
b) Cytoplasm production.
c) Activation energy.
d) Blood pressure.

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. 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.

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.

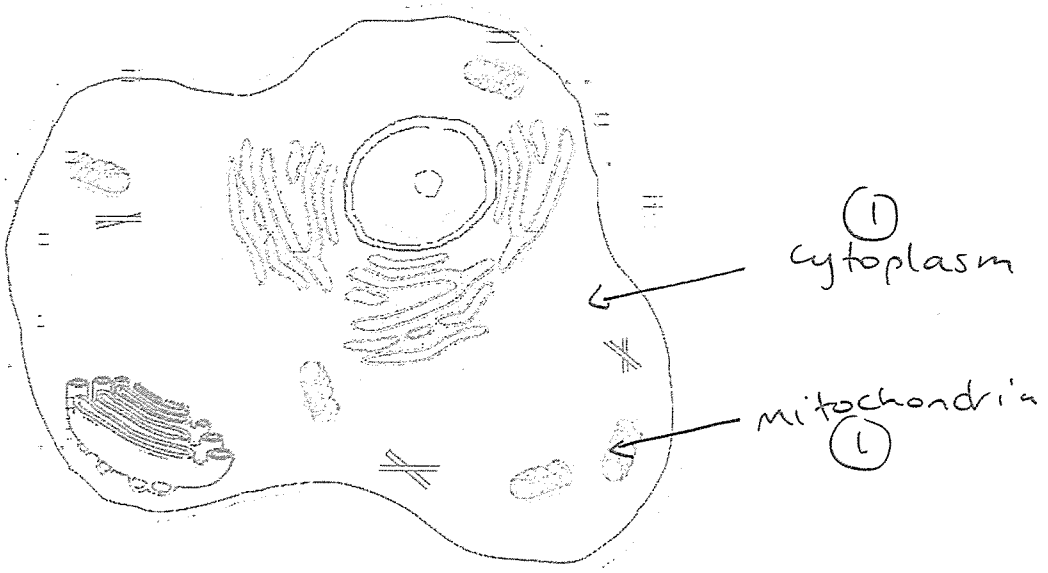
Part two – short answer

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

Nuclear DNA is located in the nucleus, mitochondrial DNA is located in the mitochondria. Nuclear DNA is passed down from both parents, Mitochondrial DNA is passed down from your mother.

(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.

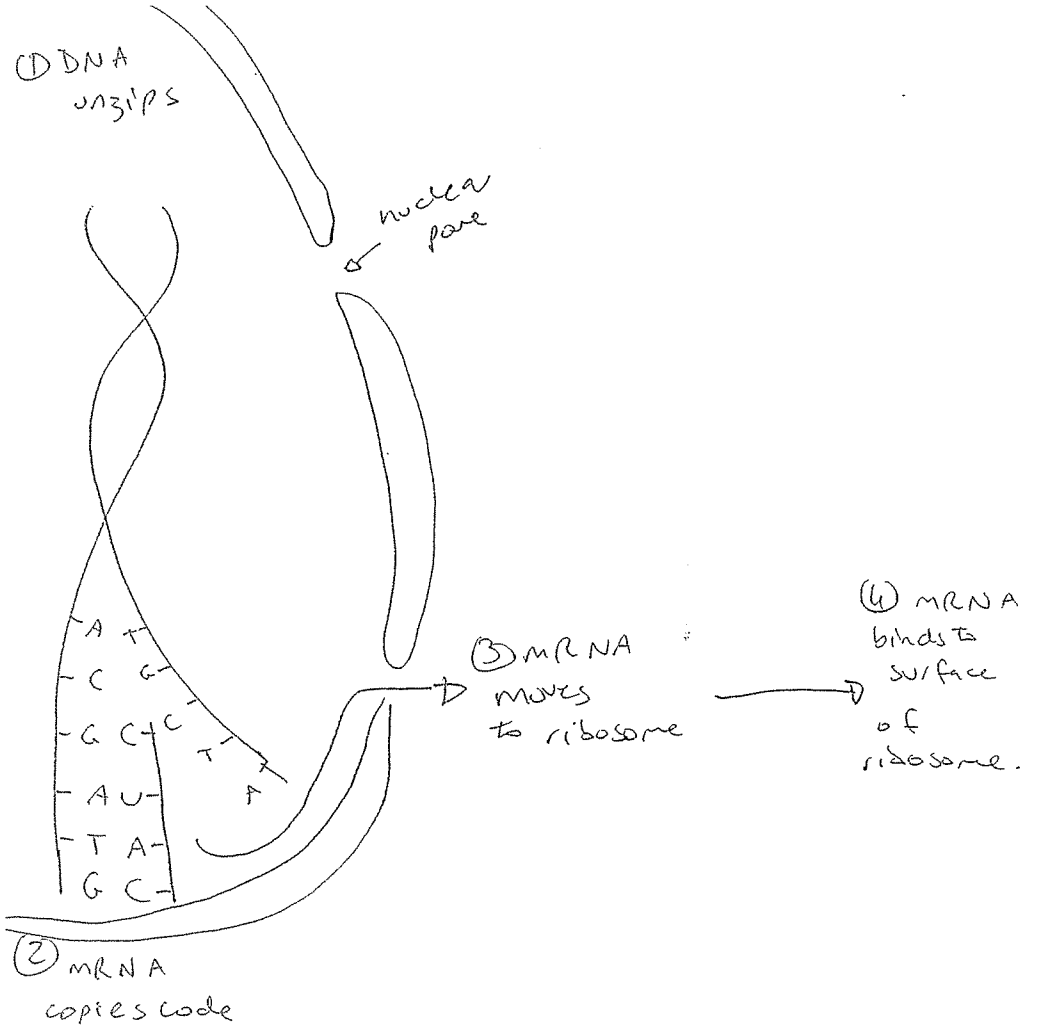
	Uses oxygen?	Location/s in cell	Amount of energy produced	Names of reaction/s that take place.	Waste products produced
Aerobic respiration	Yes (1)	cytoplasm & mitochondria (1)	36-38 ATP (1)	glycolysis, kreb's cycle, electron transport (1)	CO_2 water (1)
Anaerobic respiration	No (1)	cytoplasm (1)	2 ATP (1)	glycolysis (1)	lactic acid (1)

(10 marks)

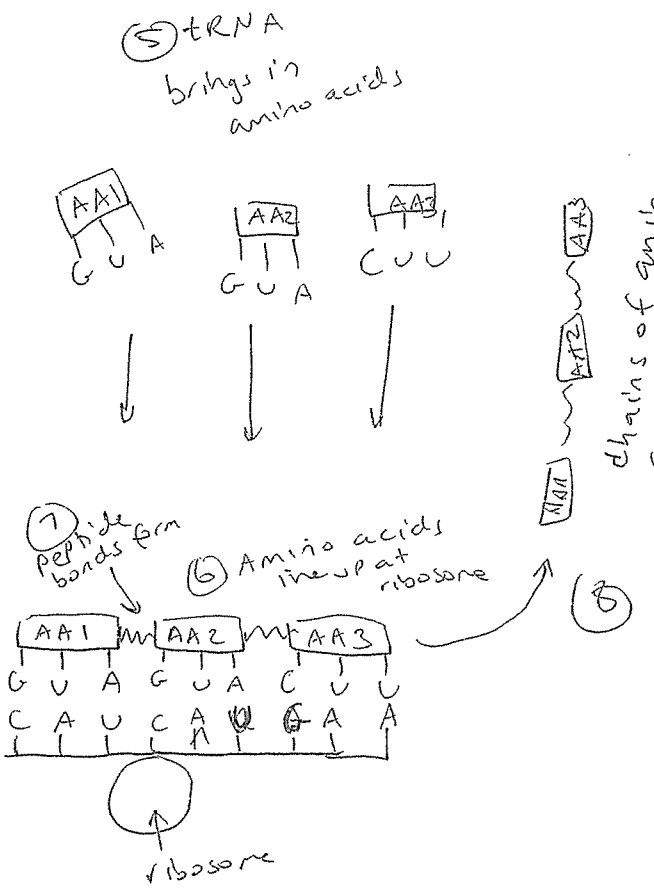
4. Explain how enzymes work, draw a diagram below to help with your explanation. (4 marks)

- The enzyme fits together with the substrate forming an enzyme substrate complex.
- the part of the enzyme that combines with the substrate is the active site.
- the substrate is then broken into its products & the enzyme can be used again.

(2) info

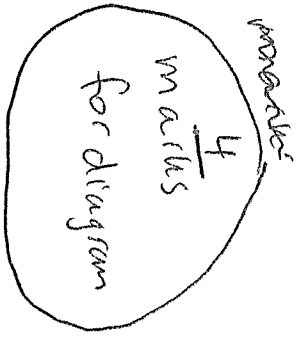


mRNA = single strand
U instead of T



peptide chains detach to other peptide chains & form polypeptide chain ⑨

twists itself up to form a protein



(1) DNA unzips. (1)

(2) Messenger RNA copies DNA code from the template strand. The sequence is identical except the thymine bases are uracil bases. (1)

(3) mRNA leaves nucleus through a nuclear pore. (1)

(4) mRNA binds to surface of ribosome (1)

(5) tRNA brings in amino acids. (1)

(6) Amino acids line up at ribosome. (1)

(7) Peptide bonds form between amino acids. (1)

(8) chains of amino acids form peptide chains. (1)

(9) Peptide ~~joins~~ chains join to other peptide chains and form polypeptide chains. (1)

(10) Polypeptide chain twists itself up to form a protein. (1)

10 marks