3A/B Biological Sciences

Energy Extended Answer.

Use the paper provided to write your responses to the following questions.

1. The energy released from glucose during respiration is used to convert the ADP molecule into an ATP molecule.

a) Draw a diagram to show this process. (3)

***Diagram shows: ATP and ADP (1)***

***An extra bond on ATP storing energy (1)***

***The energy and phosphate groups correctly (1)***

b) Describe 3 features of ATP which make it suited to the role of energy carrier. (3)

* ***Small easily mobile molecule can move throughout the cell***
* ***Weak bong holds the extra P is easily broken to release energy***
* ***Small amounts of energy can be held in the single bond***

2. Respiration and photosynthesis are often said to be opposite reactions.

a) What reasoning supports this idea? (2)

***Products = Reactants (1)***

***CO2  + H2O ---🡪 Glucose + O2 (1)***

***One is endergonic (photosynthesis) the other is exergonic (respiration) (1)***

b) Why should this statement be considered incorrect? (4)

* ***Site – chloroplast vs mitochondria***
* ***Energy – light vs ATP\***
* ***Organisms – green plants vs all organisms***
* ***Enzymes / reactions involved in both are different***
* ***Light dep and light ind vs glycolysis and Krebs cycle***
* ***Chlorophyll needed vs not***
* ***Resp occurs all the time phs only occurs in light***

3. Yeast cells living at the bottom of a stagnant lake obtain their energy in a different way to a duck swimming on the surface.

Describe in detail these differences using correct biological terminology. (6)

|  |  |
| --- | --- |
| ***Yeast*** | ***Duck*** |
| * ***Anaerobic*** * ***Cytoplasm*** * ***Without O2*** * ***2 ATP*** * ***Glycolysis*** * ***Alcohol and CO2*** | * ***Aerobic*** * ***Cytoplasm and mitochondria*** * ***With O2*** * ***36 ATP*** * ***Glycolysis and Krebs Cycle*** * ***CO2 and H2O*** |