

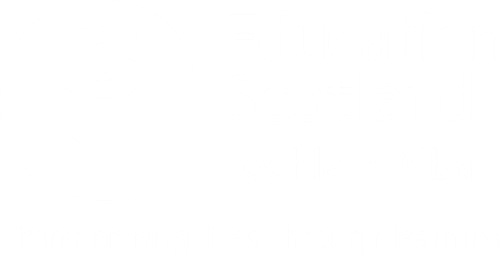
**National 5 Biology**

**Relevant Past Paper Questions from SQA Standard Grade Credit**

**and Intermediate 2 papers**

**Unit 1: Cell Biology**

**March 2014**



Transforming lives through learning

**N5 Biology Past Paper Questions**

This resource has been produced in response to the requests from practitioners who attended the National Qualifications Sciences events at Hampden Stadium in December 2013 which Education Scotland organised in partnership with the SQA.

The questions in this resource relate to the Cell Biology Unit for National 5 Biology and have been taken from the 2011, 2012 and 2013 Standard Grade and Intermediate 2 Past Papers.

For Cell Biology (Unit 1), the mandatory course key areas are as follows:

* Cell Structure
* Transport across cell membranes
* Producing new cells
* DNA and the production of proteins
* Proteins and enzymes
* Genetic Engineering
* Photosynthesis
* Respiration

In cases where the questions relate to more than one of the National 5 Units, the constituent parts of the question have been separated into their respective key areas. The stem of the question has been retained to give the context of the question. If practitioners require the full integrated question, they should refer to the original past paper on the [SQA website](http://www.sqa.org.uk/pastpapers/findpastpaper.htm?subject=Chemistry&level=).

Past paper questions for the other two National 5 Units, Multicellular Organisms and Life on Earth, are also available from Education Scotland’s National Qualifications Glow portal: <http://www.educationscotland.gov.uk/nqcoursematerials/>(cut and paste link into your browser).

Education Scotland would like to acknowledge the support of the SQA in helping us produce this resource. We hope it proves helpful to practitioners across Scotland and assists with the implementation of the national qualifications.

**Cell Structure**

|  |  |  |
| --- | --- | --- |
| Int 2 2011 B | The diagram below represents a potato cell. | Marks |
| Q1(a) & (c) | (i) Name the parts of the cell labelled X and Y. |  |
|  | X |  |
|  | Y | 2 |
|  | (ii) Give the function of structure Z. |  |
|  |  | 1 |
|  | (*c*) Give **one** difference and **one** similarity in the structure of plant and animal  cells. |  |
|  | Difference | 1 |
|  | Similarity | 1 |

|  |  |  |  |
| --- | --- | --- | --- |
| Question | Acceptable Answer | Unacceptable Answer | Marks |
| 1 (a) i | X = (sap) vacuole  Y = cytoplasm |  | 2 |
| ii | stores genetic information/DNA/chromosomes  controls cell activity(ies)/function(s) | controls the cell (reactions)  controls **all** cell activities  stores **all** DNA | 1 |
| (c) | D = only plants have a cell wall/chloroplast/ vacuole  S = both have membranes/cytoplasm/nuclei  *[Must have a comparison]* |  | 1  1 |

|  |  |  |
| --- | --- | --- |
| Int 2 A | Questions 1 and 2 refer to the plant cell diagram below. | Marks |
| Q1 & 2 |  |  |
| Q1 | Which of the plant cell components shown above is made from a structural carbohydrate? |  |
|  |  |  |
| Q2 | Which labelled part controls cell activities? |  |

|  |  |
| --- | --- |
| Question | Answer |
| 1 | C |
| 2 | B |

|  |  |  |
| --- | --- | --- |
| Int 2 2013 B Q1(a) | The diagrams below show two cells. | Marks |
|  | Complete the table below to show the names and functions of some of these labelled parts. |  |
|  |  |  |
|  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Question | Answer | Unacceptable | Negates | Marks |
| 1 (a) | Photosynthesis/makes food  Traps/absorbs/takes in light  Contains chlorophyll  vacuole  controls/allows/lets/entry and exit  (of materials)  **All 3 = 2 marks**  **2/1 = 1 mark** | Selectively permeable  One direction only  Protects/holds cell  together  Decides/chooses | things | 2 |

**Transport across cell membranes**

|  |  |  |
| --- | --- | --- |
| St Gr. 2011  Q8 (a) & (b) | The process of diffusion is important to organisms.  From the list below, select a substance which is involved in diffusion and answer the questions which follow.  ***List***  oxygen glucose carbon dioxide | Marks |
| (a) | Substance selected \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |  |
|  | (i) Explain why its diffusion is important.  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |  |
|  | (ii) Where does its diffusion take place?  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | 2 |
| (b) | (*b*) Cells from the same plant tissue were placed in three different liquids, left for 20 minutes and then examined using a microscope.  The following diagrams represent cells from each liquid. |  |
|  |  |  |
|  | Which cell is most likely to have been placed in pure water?  Give a reason for your answer.  Cell \_\_\_\_\_\_\_\_\_  Reason \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | 1 |

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| --- | --- | --- |
| Question | Answer | Unacceptable |
| 8 (a) (i) | |  |  |  |  |  | | --- | --- | --- | --- | --- | | Substance | | oxygen | glucose | carbon dioxide | | Importance | needed for respiration /  to release energy /  removal of waste | needed for respiration / energy source | removal of waste/ needed for photosynthesis | | appropriate use for named substance = 1 mark |  | | Location | lungs / alveoli / air sacs / cells / tissues / examples like muscle / placenta / mesophyll / capillaries /  cell membrane /  red blood cells / stomata | villus / small intestine /  cells / tissues / placenta / capillaries | Lungs / alveoli /  air sacs / cells / examples of tissues /  mesophyll / placenta / capillaries / stomata | | Appropriate site for diffusion (need not match importance) = 1 mark |  | | Oxygen – waste product from photosynthesis / needed for chemical reactions  Specific organs named other than lungs or placenta |
| (b) | Cell A  (Cell) has increased in volume / (Cell) is turgid / (Cell) is swollen / (Cell) vacuole has swollen  / cell wall stretched  1 mark | Cell has absorbed water / bloated (not negating) |

|  |  |  |
| --- | --- | --- |
| St Gr. 2013 7 (b) ii | State **two** properties of simple sugar molecules which allow them to be absorbed from the digestive system into the blood. | Marks |
|  | 1 |  |
|  | 2 |  |

|  |  |  |  |
| --- | --- | --- | --- |
| Question | Acceptable Answer | Not acceptable | Mark |
| 7 (b) ii | Small  Soluble both correct either order =  (accept both answers on one line as long as not negated by additional incorrect information) |  |  |

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| --- | --- | --- |
| Int 2  2011 A Q2 | The diagram below shows a model cell that was set up to investigate diffusion through a selectively permeable membrane.  Iodine is a small, soluble molecule. | Marks |
|  |  |  |
|  | Predict the colour changes which would be observed after one hour. |  |
|  |  |  |

|  |  |
| --- | --- |
| Question | Acceptable Answer |
| 2 | B |

|  |  |  |
| --- | --- | --- |
| Int 2  2012 A Q3 |  | Marks |

|  |  |
| --- | --- |
| Question | Acceptable Answer |
| 3 | C |

|  |  |  |
| --- | --- | --- |
| Int 2  2012 A Q4 |  | Marks |

|  |  |
| --- | --- |
| Question | Acceptable Answer |
| 4 | D |

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| --- | --- | --- |
| 2013 B Q1 (b) i &ii | The diagrams below show two cells. | Marks |
|  | (i) The plant cell is placed in a hypertonic solution.  Describe the appearance of the plant cell after one hour. | 1 |
|  | (ii) Explain why the animal cell would stay the same size when it is placed in an isotonic solution. | 2 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Question | Acceptable Answer | Not acceptable | Negates | Mark |
| 1 (b) i | Vacuole/cytoplasm shrunken  Membrane/cytoplasm pulled away  from wall/cytoplasm concentrated  Plasmolysed/flaccid | Other single words eg  shrunken  Plasmolysis | It/cell shrinks | 1 |
| ii | no net water movement/  equal water/osmosis in and out  Equal (water/salt) concentration  inside and out/ no concentration  gradient | Nothing happens  Water does not move  in or out  Solution moving  Water/salt equal | Any  reference to  cell wall | **1**  **1** |

|  |  |  |
| --- | --- | --- |
| Int 2 2013 B Q4 (a) i, ii & iii | A model cell was made using a visking tubing bag filled with a starch and amino acid solution. It was placed into a beaker of water and left for two hours. | Marks |
|  | (i) Amino acids were detected in the water outside the model cell.  What process is responsible for this movement? |  |
|  | (ii) Why would no starch be detected in the water outside the model cell? |  |
|  | (iii) What would happen to the mass of the model cell during the two hour period?  Explain your answer.  Mass of model cell  Explanation |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Question | Acceptable Answer | Not acceptable | Negates | Mark |
| 4 (a) i | Diffusion |  | Osmosis | 1 |
| ii | too large to fit/pass through the  pores/pass through | Insoluble  Selectively  permeable | Through cell  wall | 1 |
| iii | Increase + water moves in  water moves from high water  concentration to low /  down (water) concentration gradient/  water moves by osmosis/diffusion | HWC |  | **1**  **1** |

**Producing new cells**

|  |  |  |
| --- | --- | --- |
| St Gr.  2011  Q8 (c) & (d) | (c) The following is a description of the stages of mitosis. | Marks |
|  |  | 2 |
| (d) |  | 1 |

|  |  |  |  |
| --- | --- | --- | --- |
| Question | Acceptable Answer | Not acceptable | Mark |
| 8 (c) | Stage 2 Nuclear membrane disappears / breaks down **or** Spindle forms **or**  Chromosomes / (pairs of) chromatids / they move to equator / middle of cell  Stage 4 Chromatids / they separate **or** Chromatids / they are pulled apart **or** Spindle fibres shorten | Chromosomes shorten and thicken  Chromatids join together at centromere  Chromosomes / chromatids split  Chromosomes separate | 1  1 |
| (d) | So there is no loss of information / So they have the same information (as parent cell) / So they have a full set of information / genes / all genes passed on | So they have all the characteristics of the species – negates  So they function properly  So they have correct information  Same genetics  To stop mutation (negates) | 1 |

|  |  |  |
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| St Gr.  2012  Q9 | The diagrams below show two stages of mitosis in cells.  Draw **one** straight line from each diagram to its correct description. | Marks |
|  |  | 2 |
| (b) |  | 1 |

|  |  |  |  |
| --- | --- | --- | --- |
| Question | Acceptable Answer | Not acceptable | Mark |
| 9 (a) |  | Additional lines negate.  1 mark each. | 2 |
| (b) | (Daughter cells) have identical information as the parent cell /  Ensures that no information is lost / changed  Daughter cells have a full chromosome complement  Daughter cells have all the correct information  (information : genes : DNA : chromosomes) | Have the same number of chromosomes | 1 |

**DNA and the production of proteins**

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| Int 2 2011 B Q7(c) |  | Marks  2 |

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| --- | --- |
| Question | Acceptable Answer |
| 7 (c) | order, bases, protein  **3 = 2 marks**  **2/1 = 1 mark** |

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| Int 2 2013 B Q9(a) |  | Marks  2 |

|  |  |
| --- | --- |
| Question | Acceptable Answer |
| 9 (a) | bases amino acids proteins  all 3 = 2 marks  2/1 = 1 mark |

**Proteins and Enzymes**

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| --- | --- | --- |
| St Gr. 2012 Q17(a) & (c) | (a) Biological washing powders contain enzymes. Explain how these enzymes work to remove stains. | Marks  2 |
|  | (c) Biological washing powders contain different enzymes.    Explain why this is necessary. | 1 |

|  |  |  |  |
| --- | --- | --- | --- |
| Question | Acceptable Answer | Not acceptable | Mark |
| 17 (a) | Digest stains / breakdown stains  Makes stains more soluble / so stains can be washed out | react with stains | 1  1 |
| (c) | Different types of stains require different enzymes to digest them / One enzyme cannot digest all types of stains / Enzymes are specific to particular stains / For different types of stains  (Answer must refer to stains) | Enzymes are specific | 1 |

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| --- | --- | --- |
| St Gr. 2013 Q8(b) i & ii | In an investigation into the digestion of protein, two groups of pupils made jelly beads containing a protease enzyme. The beads were then left in a beaker of cloudy protein suspension for 20 minutes.  The contents of the beaker became clear as the protein was digested. | Marks |
|  |  |  |
|  | (*b*) (i) What term is used to describe the temperature at which an enzyme works best? |  |
|  | (ii) Name **one** factor, other than temperature, which has an effect on the activity of an enzyme. |  |

|  |  |  |  |
| --- | --- | --- | --- |
| Question | Acceptable Answer | Not acceptable | Mark |
| 8 (b) i | Optimum |  | 1 |
| ii | pH / concentration of enzyme / concentration of substrate |  | 1 |

|  |  |  |
| --- | --- | --- |
| Int 2 2011 A Q18 | Which of the following is an example of selective breeding? | Marks |
|  | A Increasing milk yield in dairy cattle  B Industrial melanism in Peppered moths  C Insulin production by bacteria  D Insertion of DNA into a bacterium | 1 |

|  |  |
| --- | --- |
| Question | Acceptable Answer |
| 18 | D |

|  |  |  |
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| Int 2 2011 B Q1(b) | The diagram below represents a potato cell. | Marks |
|  | (*b*) Name the enzyme involved in the synthesis of starch in potato cells. |  |

|  |  |
| --- | --- |
| Question | Acceptable Answer |
| 1(b) | (potato/starch) phosphorylase |

|  |  |  |
| --- | --- | --- |
| Int 2 2011 B Q4 | Enzymes are biological catalysts. The diagram below shows part of an enzyme  controlled reaction. | Marks |
|  | (*a*) Describe the features of an enzyme which allow it to combine with  only one substrate. | 2 |
|  | (*b*) What happens to an enzyme when it is boiled? | 1 |
|  | (*c*) Name a factor, other than temperature, which affects enzyme activity. | 1 |
|  | (*d*) Complete the following word equation for the enzyme catalase. | 1 |
|  |  |  |

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| --- | --- | --- | --- |
| Question | Acceptable Answer | Not acceptable | Mark |
| 4 (a) | enzyme has an active site  (must be clear active site on enzyme)  enzyme/active site is complementary/matching shape/specific to substrate | Same shape enzyme/active site  Enzyme fits substrate (or vice versa) | 1  1 |
| (b) | denatured/  changes shape/  reduced activity/  stops working | destroyed | 1 |
| (c) | pH OR concentration of enzyme/substrate  [any other correct eg Higher] | concentration | 1 |
| (d) | water and oxygen [any order]  **both for 1 mark** |  | 1 |

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| --- | --- | --- |
| Int 2 2012 A Q6 | Which line in the table below correctly shows the functions of an enzyme? | Marks |
|  |  | 1 |

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| --- | --- |
| Question | Acceptable Answer |
| 6 | A |

|  |  |  |
| --- | --- | --- |
| Int 2 2012 B Q2(a) |  | Marks  2 |

|  |  |  |  |
| --- | --- | --- | --- |
| Question | Acceptable Answer | Not acceptable | Mark |
| 2 (a) | mass of substrate/enzyme  volume of substrate/enzyme  concentration of substrate/enzyme  same substrate/enzyme  temperature  time left to run  size of test tube  **Any two**  **Only 1 from each line** | amount/measure/quantity  percentage  volume of solution  pH  time (single word)/time taken | 2 |

|  |  |  |
| --- | --- | --- |
| Int 2 2013 Q19 |  | Marks  1 |

|  |  |
| --- | --- |
| Question | Acceptable Answer |
| 19 | A |

**Genetic Engineering**

|  |  |  |
| --- | --- | --- |
| St Gr. 2013 Q14(c) | The grid below shows structures related to the nervous system. | Marks |
|  |  |  |
|  | Complete the sequence below, using letters from the grid, to show the order of the structures through which a nerve impulse travels in a reflex action. |  |
|  |  | 1 |

|  |  |
| --- | --- |
| Question | Acceptable Answer |
| 14 (c) |  |

|  |  |  |
| --- | --- | --- |
| Int 2 2011 A Q13 |  | Marks |

|  |  |
| --- | --- |
| Question | Acceptable Answer |
| 13 | A |

|  |  |  |
| --- | --- | --- |
| Int 2  2012  B Q7 | The diagram below represents some of the stages of genetic engineering which are  used to produce medicines such as insulin for human use. | Marks |
|  |  |  |
|  | (*a*) Complete the table below to identify the labelled parts of the diagram. |  |
|  |  |  |
|  | (*b*) Describe the next stage needed to produce insulin for use as a medicine. |  |
|  | (*c*) Name another human hormone produced by genetic engineering. |  |
|  | (*d*) State **one** advantage of genetic engineering. |  |

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| --- | --- | --- | --- |
| Question | Acceptable Answer | Not acceptable | Mark |
| 7 (a) | bacterial cell E  insulin gene C  plasmid D  All 3= 2  1/2= 1 |  | 2 |
| (b) | plasmid replicated/reproduced/copied/ duplicated  OR  bacteria/cell multiplied/reproduced/divided | grow  mitosis | 1 |
| (c) | growth hormone (any other correct) | GH | 1 |
| (d) | increased range of products/increased rate of production/produced quicker  large/increased volume/mass of product (or named example)/  lower cost of production/  less/no allergy to product  OR  an example of moral/ethical issue e.g.  product made without killing animals/without infection from human donors | cheap/quicker process  guaranteed product | 1 |

**Photosynthesis**

|  |  |  |
| --- | --- | --- |
| St Gr.  2012 Q5 (b),(c) & (d) |  | Marks  1 |
|  |  | 1 |
|  |  | 2 |

|  |  |  |  |
| --- | --- | --- | --- |
| Question | Acceptable Answer | Not acceptable | Mark |
| 5 (b) | increasing  increases  both correct = 1 |  | 1 |
| (c) | X carbon dioxide (concentration) / Lack of carbon dioxide  Y temperature / temperature too low  both correct = 1 | temperature too high | 1 |
| (d) | carbon dioxide  glucose  starch  3 correct = 2  1 / 2 correct = 1 |  | 2 |

|  |  |  |
| --- | --- | --- |
| St Gr. 2013  Q5 (a) ii & (b) | Two gardeners compared their tomato crops. Both grew 10 plants of the same variety in a greenhouse.  One gardener altered the environmental conditions in his greenhouse to increase the rate of photosynthesis. His plants yielded 720 tomatoes.  The other gardener only produced 480 tomatoes. | Marks |
| (ii) | Describe **two** changes to the environmental conditions in the greenhouse which could have increased the rate of photosynthesis.  1  2 | 1 |
| (b) | (ii) Name a tissue in the leaves of plants in which photosynthesis takes place. | 1 |

|  |  |  |  |
| --- | --- | --- | --- |
| Question | Acceptable Answer | Not acceptable | Mark |
| 5 (a) | Increased carbon dioxide / temperature / water / moisture / humidity / light / fertiliser  Any two  (must include increase, or equivalent) |  | 1 |
| (b) ii | Mesophyll / spongy mesophyll / palisade mesophyll / palisade / lower epidermis | Guard cells / upper epidermis /  spongy layer | 1 |

|  |  |  |
| --- | --- | --- |
| Int 2 2011  A Q5 | The diagrams below show four experiments used in an investigation into the conditions needed for photosynthesis. | Marks |
|  |  |  |
|  | The results from which two experiments should be compared to show that light is needed for photosynthesis? |  |
|  | A 1 and 2  B 1 and 4  C 2 and 3  D 3 and 4 |  |

|  |  |
| --- | --- |
| Question | Acceptable Answer |
| 5 | A |

|  |  |  |
| --- | --- | --- |
| Int 2 2011  A Q7 | A crop of tomatoes was grown in a polytunnel. | Marks |
|  |  |  |
|  | Which of the following changes would **not** produce an earlier crop of tomatoes? |  |
|  | A Increasing the heating during the day.  B Increasing the CO2 concentration at night.  C Increasing the light intensity at night.  D Increasing the CO2 concentration during the day. | 1 |

|  |  |
| --- | --- |
| Question | Acceptable Answer |
| 7 | B |

|  |  |  |
| --- | --- | --- |
| Int 2 2012 C Q1B | The diagram below shows the green water plant *Elodea* used in an experiment to investigate photosynthesis. | Marks |
|  |  |  |
|  | Describe how the requirements for photosynthesis shown in the diagram are used in photolysis and carbon fixation to produce oxygen and starch. | 5 |

|  |  |  |
| --- | --- | --- |
| **Answer** |  | **Max Mark** |
| P1 light (energy) from lamp absorbed by *Elodea/*plant/chlorophyll/ chloroplast |  |  |
| P2 energy used to split water | Max 3 |  |
| P3 into H and O |  |  |
| P4 energy used to produce ATP |  |  |
|  |  |  |
| C1 CO2 in water joins with H |  |  |
| C2 using (energy from) ATP |  |  |
| C3 to form glucose | Max 3 |  |
| C4 glucose molecules joined to produce starch (any conversion) |  |  |
| C5 enzyme controlled |  | 5 |

|  |  |  |
| --- | --- | --- |
| Int 2 2013  B Q5 | (a) | Marks  2 |
|  | (b)  Decide if each of the following statements about photosynthesis is **True** or **False**, and tick (3) the appropriate box.  If the statement is **False**, write the correct word(s) in the **Correction** box to replace the word(s) underlined in the statement. |  |
|  |  | 3 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Question | Acceptable Answer | Not acceptable | Negates | Mark |
| 5 (a) | carbon dioxide  green plants  cellulose  **All 3 = 2 marks**  **2/1 = 1 mark** |  |  | 2 |
| (b) ii | False photolysis/light stage/reaction 1  True 1  False ATP 1  **(*accept crosses or other mark*)** | Any full sentence  changed | No tick  Both T and F  ticked | 1 |

**Respiration**

|  |  |  |
| --- | --- | --- |
| St Gr. 2012 Q14 (c) | As milk sours there is a change in pH. The following graph shows the pH changes in a sample of milk over 50 hours at a temperature of 20 °C. | Marks |
|  |  |  |
|  | The souring of milk is a fermentation process.  Name the substrate, product and the type of micro-organism involved. |  |
|  | Substrate  Product  Type of micro-organism | 2 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Question | Acceptable Answer | Not acceptable | Negates | Mark |
| 14 (c) | lactose  lactic acid  bacteria  **All 3 = 2 marks**  **2/1 = 1 mark** |  |  | 2 |

|  |  |  |
| --- | --- | --- |
| Int 2 2011 A Q1 | Which substance enters animal cells by diffusion and is used to produce ATP? | Marks |
|  | A Carbon dioxide  B Starch  C Water  D Glucose |  |

|  |  |
| --- | --- |
| Question | Acceptable Answer |
| 1 | D |

|  |  |  |
| --- | --- | --- |
| Int 2 2011 A Q3 | The diagram below shows energy transfer within a cell. | Marks |
|  |  |  |
|  | Which line in the table identifies correctly compounds X and Y? |  |
|  |  | 1 |

|  |  |
| --- | --- |
| Question | Acceptable Answer |
| 3 | C |
| Int 2 2011 A Q4 | Which of the following stages in respiration would result in the production of 38 molecules of ATP? | | | | Marks |
|  | A Glucose to pyruvic acid  B Pyruvic acid to lactic acid  C Pyruvic acid to carbon dioxide and water  D Glucose to carbon dioxide and water | | | |  |

|  |  |
| --- | --- |
| Question | Acceptable Answer |
| 4 | D |

|  |  |  |
| --- | --- | --- |
| Int 2 2012 A Q5 | The apparatus below was used to investigate gas exchange in germinating peas. | Marks |
|  |  |  |
|  | The movement of the coloured liquid in the capillary tube can be used to measure the volume of |  |
|  | A oxygen produced by respiration  B carbon dioxide used up by respiration  C oxygen used up by respiration  D carbon dioxide produced by respiration. |  |

|  |  |
| --- | --- |
| Question | Acceptable Answer |
| 5 | C |

|  |  |  |
| --- | --- | --- |
| Int 2 2012 B Q3 (a) ii, (b) | The process of aerobic respiration in a muscle cell is outlined below. | Marks |
|  |  |  |
| (a) | (ii) Name product Y from Stage 1. |  |
| (b) | ATP is formed during respiration and broken down for uses in cells.  (i) How many molecules of ATP are formed from each glucose molecule during  Stage 1 only?  Both Stage 1 and Stage 2? | 1 |
|  | (ii) What **two** molecules are produced when ATP is broken down?  and | 1 |
|  | (iii) State **one** use of the energy released when ATP is broken down. | 1 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Question | Acceptable Answer | Not acceptable | Negates | Mark |
| 3 (a) ii | pyruvic acid/pyruvate |  |  | 1 |
| (b) i | stage 1 = 2/4  stage 1 + 2 = 38/36/40  Only accept 40 if 4 in stage 1  **Both for 1 mark** |  |  | 1 |
| ii | ADP and Pi  **Both** | phosphate | Any incorrect numbers | 1 |
| iii | muscle contraction/movement/synthesis (of proteins)/growth/cell division/transmission of nerve impulses/heat production/glycolysis  (and any other correct) | respiration/photosynthesis/  metabolism/reproduction/heat/  warmth/temperature |  |  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Int 2 2012 B Q3 (b) | The table below shows how altitude affects the percentage oxygen carried in blood. | | | | | Marks | |
|  |  | | | | |  | |
|  | **Use the data in the table** to explain why a runner who lives at an altitude of 2800 metres would fatigue more quickly if racing in an event at 4700 metres. | | | | | 2 | |
| Question | Acceptable Answer | Not acceptable | Negates | | Mark | |
| 9 (b) | % oxygen (in blood) will fall from 91% to 80%/ by 11% |  |  | | 2 | |
|  |  | Oxygen debt |  | |  | |
|  | Answer to include one from each column |  |  | |  | |