



Mark Scheme (Results)

January 2013

International GCSE
Biology (4BI0) Paper 2B

Edexcel Level 1/Level 2 Certificate
Biology (KBI0) Paper 2B

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| Question number | Answer | Notes | Marks |
|-----------------|--|--|-----------|
| 1 (a) | DNA / part of a chromosome / eq; codes for protein / makes protein / determines characteristic / determines named characteristic / eq; | | 2 |
| (b) | (release/ produce) lots of eggs / more eggs / ovulate more / eq; | need idea of larger quantity | 1 |
| (c) | uterus / womb; | | 1 |
| (d) | smoking / (having) cigarette / (having) tobacco; | | 1 |
| (e) | <u>50 (%)</u> ; | | 1 |
| (f) (i) | protein/blood clotting factor digested/destroyed (by acid) / eq; | allow broken down ignore need to separate from milk ignore sugar | 1 |
| (f) (ii) | glucose; (more) respiration / energy / ATP; milk / meat production / growth / eq; | | 2 |
| (g) | <u>transplant</u> / <u>transplantation</u> ; (more) hearts available / less shortage / less waiting time / no need for donors / few donors / lowers demand / eq; less immune response / less rejection / human proteins / human DNA / human genes / tissue type / better match / compatible / eq; less deaths / live longer / eq; | ignore work for longer / reduce heart attacks | 3 |
| | | Total | 12 |

| Question number | Answer | Notes | Marks | | | | | | | | | | |
|-----------------|--|--|-----------|------|---|--|---|--|---|-------|-----|--|---|
| 2 (a) | 120 to 136;; within range of 60 to 68 = 1 an indication of times 2 = 1 | any number in working times 2 = 1 eg. 50 x 2 = 100 gets one mark | 1 | | | | | | | | | | |
| (b) | 0.00138 / 0.0014 / 1.38×10^{-3} ;; allow one mark for 0.2/6 or 0.03(3) or 0.2/24 or 0.008 in working | | 2 | | | | | | | | | | |
| (c) | surface (area) covered or exposed / side of leaf covered or exposed / place where jelly put / eq; | ignore quantity of jelly | 1 | | | | | | | | | | |
| (d) | (loss of) mass / weight; | | 1 | | | | | | | | | | |
| (e) | light / wind / humidity / temperature / time / species / eq; | | 1 | | | | | | | | | | |
| (f) (i) | <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Mass lost</th> <th>Leaf</th> </tr> </thead> <tbody> <tr> <td>Most</td> <td>A</td> </tr> <tr> <td></td> <td>C</td> </tr> <tr> <td></td> <td>B</td> </tr> <tr> <td>Least</td> <td>D;;</td> </tr> </tbody> </table> | Mass lost | Leaf | Most | A | | C | | B | Least | D;; | if wrong order then allow one mark for A before D OR C before B | 2 |
| Mass lost | Leaf | | | | | | | | | | | | |
| Most | A | | | | | | | | | | | | |
| | C | | | | | | | | | | | | |
| | B | | | | | | | | | | | | |
| Least | D;; | | | | | | | | | | | | |
| (ii) | stomata; (more) on lower surface / (fewer) on upper surface / eq; A no surface covered most mass lost /water lost C upper surface covered next most mass/water lost B lower surface covered less mass /water lost D both surfaces covered least mass /water lost sensible link between leaf coverage and loss of mass/water; | ignore guard cells allow converse between surface exposed and mass lost | 3 | | | | | | | | | | |
| | | Total | 12 | | | | | | | | | | |

| Question number | Answer | Notes | Marks |
|-----------------|--|---|----------|
| 3 (a) | temperature recorder / eq; cooling jacket / cooling water / water in if hot / eq; | | 2 |
| (b) | respiration produces heat; enzymes; denatured / destroyed / eq; optimum; best growth / maximum growth / more product / eq; microorganisms killed / eq; | | 2 |
| (c) | mixing / distributing oxygen / air; for respiration; mixing / distributing nutrients / microorganisms; for growth; mixing / distributing heat / temperature; for respiration / enzymes; | mix air and heat = 2 | 2 |
| (d) | pH / acidity / alkalinity; <u>enzymes</u> ; oxygen; <u>respiration</u> ; (other) microorganisms / sterility; competition / contamination / less product / eq; | mark in discrete pairs ignore air | 2 |
| (e) | insulin / penicillin / antibiotic / <i>Fusarium</i> / mycoprotein / any named GM product / eq; | ignore bacteria / fungus / cheese / yoghurt / beer / ethanol / medicine | 1 |
| | | Total | 9 |

| Question number | Answer | Notes | Marks |
|-----------------|--|--|----------|
| 4 (a) (i) | B; | | 1 |
| (ii) | A; | | 1 |
| (iii) | C; | | 1 |
| (b) (i) | zygote; | | 1 |
| (ii) | mitosis ; | | 1 |
| (iii) | diploid with 46 chromosomes; | ignore tick cross hybrid two ticks present = 0 | 1 |
| (c) | placenta; from mother's blood; diffusion / high conc. to low conc.; large surface area / thin / eq; <u>umbilical</u> cord; | ignore gas exchange / ignore carried | 3 |
| | | Total | 9 |

| Question number | Answer | Notes | Marks |
|-----------------|---|--|-----------|
| 5 (a) | cell membrane; cytoplasm; plasmid; nucleoid / chromosome / DNA once; | reject nucleus / nucleolus ignore vacuole / ribosomes / mitochondria | 3 |
| (b) (i) | enzymes; <u>optimum</u> ; denatured / destroyed / eq; | ignore references to low pH and high pH | 2 |
| (ii) | amino acids; protein / DNA; | | 2 |
| (iii) | active transport / active uptake; low to high conc. / against conc. gradient / eq; respiration / energy / ATP; root <u>hair</u> (cells); large surface area / eq; | | 3 |
| (c) (i) | X at 100; | allow any indication at 100 | 1 |
| (ii) | 11.1%;; allow one mark for 8000 or 7200 or 800 in working | | 2 |
| (iii) | nitrate (already) in soil / <u>nitrogen fixing</u> bacteria / nitrification / organic material in soil / eq; | | 1 |
| | | Total | 15 |

| Question number | Answer | Notes | Marks |
|-----------------|--|--|----------|
| 6 (a) | smaller surface area to volume ratio; less heat loss / more energy measured / eq; heats up slowly / avoid boiling / eq; | accept converse | 2 |
| (b) | insulation / lid / cover / eq; less heat/energy loss; burning food close to tube / eq; less heat/energy loss; quick transfer of burning food / eq; less heat/energy loss; stir / eq; even temperature; avoid draft / wind; less heat/energy loss; digital thermometer ; precision / eq; use calorimeter / burn in oxygen; all food burnt / less heat/energy loss; | mark in discrete pairs reject idea of more bread ignore repeat | 2 |
| | | Total | 4 |

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