



**Cambridge International Examinations**  
Cambridge International General Certificate of Secondary Education

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**BIOLOGY**

**0610/42**

Paper 4 Theory (Extended)

**May/June 2017**

MARK SCHEME

Maximum Mark: 80

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**Published**

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**Mark schemes will use these abbreviations**

- ; separates marking points
- / alternatives
- **I** **I**
- **R** reject
- **A** **A** (for answers correctly cued by the question, or guidance for examiners)
- AW alternative wording (where responses vary more than usual)
- AVP any valid point
- **ecf** credit a correct statement / calculation that follows a previous wrong response
- **ora** or reverse argument
- ( ) the word / phrase in brackets is not required, but sets the context
- underline actual word given must be used by candidate (grammatical variants excepted)
- max indicates the maximum number of marks that can be given

| Question | Answer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Marks | Guidance                                                                                                                                                                                                                                              |
|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1(a)(i)  | yeast ;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 1     | <b>A</b> fungus / <i>Saccharomyces (cerevisiae)</i> / <i>S. cerevisiae</i>                                                                                                                                                                            |
| 1(a)(ii) | respiration / fermentation ;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 1     |                                                                                                                                                                                                                                                       |
| 1(b)(i)  | <b>1</b> drought ;<br><b>2</b> flooding / tsunami / monsoon / hurricane / cyclone ;<br><b>3</b> earthquake ;<br><b>4</b> volcanic eruption ;<br><b>5</b> (named) disease ;<br><b>6</b> AVP ;                                                                                                                                                                                                                                                                                                                                                                                                                     | 2     | <b>MP 1 I</b> desertification<br><b>I</b> tornado / landslide (too localised) / acid rain (not natural) / loss of soil fertility (usually not natural)<br><b>I</b> fire<br>e.g. potato blight / foot and mouth disease<br>e.g. (locust / rat) plagues |
| 1(b)(ii) | <b>1</b> increased demand for food ;<br><b>2</b> unequal (global) distribution of food ;<br><b>3</b> war / poverty ;<br><b>4</b> limited land for farming / increased urbanisation / AW ;<br><b>5</b> cash crops ;<br><b>6</b> poor farming practice ;<br><b>7</b> pollution (linked to crop failure) ;<br><b>8</b> AVP ;                                                                                                                                                                                                                                                                                        | 3     | <b>A</b> (food) spoilage / wastage<br><b>A</b> government policies / sanctions<br><br><b>A</b> biofuels / tobacco (crops)<br>e.g. loss soil fertility / erosion / eutrophication<br>e.g. acid rain burning crops<br>e.g. overfishing                  |
| 1(c)     | <b>1</b> outbreaks / spreading, of diseases / pests / plagues ;<br><b>2</b> endangered / extinction, of species ;<br><b>3</b> disruption to food chains / described ;<br><b>4</b> loss in (variety) of, habitat / places where organisms live / described ;<br><b>5</b> loss of nutrients / disrupted nutrient cycling ; disrupted (soil) fertility<br><b>6</b> decreased in (soil) water / desertification ;<br><b>7</b> soil erosion / described ;<br><b>8</b> increased (described) pollution ;<br><b>9</b> deforestation ;<br><b>10</b> efficient food production so less land required ;<br><b>11</b> AVP ; | 4     | <b>A</b> loss of (bio)diversity<br><br><br><b>A</b> landslides / reduced soil volume<br><br><br>e.g. targeted use of pesticides / AW                                                                                                                  |

| Question   | Answer                                                                                                                                                                                                                                                                                                                                                                                                           | Marks | Guidance                                                |
|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|---------------------------------------------------------|
| 2(a)       | a length of DNA ;<br>that codes for a <u>protein</u> ;                                                                                                                                                                                                                                                                                                                                                           | 2     | I characteristics / traits<br>A polypeptide for protein |
| 2(b)       | 1 ribosomes make proteins ;<br>2 <u>mRNA</u> is copied, from gene / DNA ;<br>3 gene / DNA, remains in nucleus ;<br>4 <u>mRNA</u> moves, from nucleus to, cytoplasm / ribosome ;<br>5 <u>mRNA</u> passes through ribosome / AW ;<br>6 ribosome assembles amino acids (into a protein) / AW ;<br>7 (protein synthesis) uses energy ;<br>8 order of amino acids determined by base sequence of, mRNA / DNA / gene ; | 4     | A protein synthesis at, ribosomes / (rough) ER          |
| 2(c)(i)(i) | active transport ;                                                                                                                                                                                                                                                                                                                                                                                               | 1     |                                                         |
| 2(c)(ii)   | 1 protein uses, energy / ATP (from respiration) ;<br>2 <i>idea of</i> protein interaction with ions ;<br>3 (to) change shape of protein ;<br>4 ions move through the protein ;<br>5 against concentration gradient / lower concentration to high concentration (across a membrane) ;<br>6 AVP ;                                                                                                                  | 3     | e.g. ref to selective / specific shape                  |
| 2(d)       | 1 plasma proteins ;<br>2 haemoglobin ;<br>3 (named) enzymes ;<br>4 antibodies ;<br>5 fibrinogen ;<br>6 (named) hormone ;                                                                                                                                                                                                                                                                                         | 2     | A fibrin<br>A insulin / glucagon / ADH / oxytocin       |

| Question             | Answer                                                                                                                                                                                                                                                                                                                                                                                                                                   | Marks                   | Guidance                                        |                         |                  |          |                |      |          |            |                     |        |        |          |                              |      |          |   |                  |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|-------------------------------------------------|-------------------------|------------------|----------|----------------|------|----------|------------|---------------------|--------|--------|----------|------------------------------|------|----------|---|------------------|
| 3(a)                 | (motor / effector) neuron(e) / nerve (cell) ;                                                                                                                                                                                                                                                                                                                                                                                            | 1                       | R relay / sensory / SAN / pacemaker             |                         |                  |          |                |      |          |            |                     |        |        |          |                              |      |          |   |                  |
| 3(b)(i)              | <table border="1"> <tr> <th>position on Fig. 3.1</th><th>result of electric activity</th><th>atrioventricular valves</th><th>semilunar valves</th></tr> <tr> <td><b>P</b></td><td>atria contract</td><td>open</td><td>closed ;</td></tr> <tr> <td><b>QRS</b></td><td>ventricles contract</td><td>closed</td><td>open ;</td></tr> <tr> <td><b>T</b></td><td>atria and ventricles relaxed</td><td>open</td><td>closed ;</td></tr> </table> | position on Fig. 3.1    | result of electric activity                     | atrioventricular valves | semilunar valves | <b>P</b> | atria contract | open | closed ; | <b>QRS</b> | ventricles contract | closed | open ; | <b>T</b> | atria and ventricles relaxed | open | closed ; | 3 | one mark per row |
| position on Fig. 3.1 | result of electric activity                                                                                                                                                                                                                                                                                                                                                                                                              | atrioventricular valves | semilunar valves                                |                         |                  |          |                |      |          |            |                     |        |        |          |                              |      |          |   |                  |
| <b>P</b>             | atria contract                                                                                                                                                                                                                                                                                                                                                                                                                           | open                    | closed ;                                        |                         |                  |          |                |      |          |            |                     |        |        |          |                              |      |          |   |                  |
| <b>QRS</b>           | ventricles contract                                                                                                                                                                                                                                                                                                                                                                                                                      | closed                  | open ;                                          |                         |                  |          |                |      |          |            |                     |        |        |          |                              |      |          |   |                  |
| <b>T</b>             | atria and ventricles relaxed                                                                                                                                                                                                                                                                                                                                                                                                             | open                    | closed ;                                        |                         |                  |          |                |      |          |            |                     |        |        |          |                              |      |          |   |                  |
| 3(b)(ii)             | to prevent backflow / AW ;<br>ensures one-way flow of blood (through the heart) ;                                                                                                                                                                                                                                                                                                                                                        | 1                       | I pressure changes                              |                         |                  |          |                |      |          |            |                     |        |        |          |                              |      |          |   |                  |
| 3(c)(i)              | 43 ;;<br>OR<br>48 ;;                                                                                                                                                                                                                                                                                                                                                                                                                     | 2                       | one mark for correct working if value incorrect |                         |                  |          |                |      |          |            |                     |        |        |          |                              |      |          |   |                  |
| 3(c)(ii)             | <b>1</b> increased electrical activity during exercise ; <b>ora</b><br><b>2</b> comparative data before ;<br><b>3</b> no / small, difference in, height of peak / amplitude ;<br><b>4</b> waves closer together during exercise / S–T interval is shorter ;                                                                                                                                                                              | 3                       |                                                 |                         |                  |          |                |      |          |            |                     |        |        |          |                              |      |          |   |                  |
| 3(c)(iii)            | deeper (breaths) / increased volume (of lung) ;<br>faster (rate) ;<br>AVP ;                                                                                                                                                                                                                                                                                                                                                              | 2                       |                                                 |                         |                  |          |                |      |          |            |                     |        |        |          |                              |      |          |   |                  |

| Question | Answer                                                                                                                                                                                                                                                                                                                    | Marks    | Guidance                                                                                                                  |
|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|---------------------------------------------------------------------------------------------------------------------------|
| 4(a)     | <b>1</b> all, nutrients / components ;<br><b>2</b> nutrients in correct, proportions / amounts ;<br><b>3</b> at least three named 'components' ;<br><b>4</b> to maintain health ;<br><b>5</b> appropriate energy requirements / AW ;<br><b>6</b> different requirements according to, age / sex / lifestyle / pregnancy ; | <b>3</b> | <b>A</b> prevent (named) deficiencies                                                                                     |
| 4(b)     | <b>1</b> lack of growth / low body weight / weight loss ;<br><b>2</b> (described) effect on, hair / skin / nails ;<br><b>3</b> diarrhoea / vomiting ;<br><b>4</b> fatigue ;<br><b>5</b> muscle wasting ;<br><b>6</b> (more) prone to, infections / disease ;                                                              | <b>3</b> | <b>A</b> dehydration<br><b>A</b> irritable / dizzy / weak / AW<br><b>A</b> muscle weakness<br><b>A</b> wounds heal slowly |

| Question | Answer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Marks    | Guidance                                                                                                                                    |
|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|---------------------------------------------------------------------------------------------------------------------------------------------|
| 4(c)     | <p><i>description</i></p> <p><b>1</b> marasmus child lower mass than healthy child, initially / AW ;</p> <p><b>2</b> initial (rapid) increase in mass of child with marasmus ;</p> <p><b>3</b> then trend almost follows increase of healthy children ;</p> <p><b>4</b> later / AW, marasmus child is similar to / heavier than, healthy child ;</p> <p><b>5</b> comparative data in children's mass with units stated at least once ;</p> <p><b>6&amp;7&amp;8</b> comparative data of milk with units stated at least once ;;;</p> <p><i>explanation</i></p> <p><b>9</b> protein required for, new cells / muscle / repair ;</p> <p><b>10</b> carbohydrates / fats, required for, energy / respiration ;</p> <p><b>11</b> fats required for, insulation / cell membranes / protecting organs / neurones ;</p> <p><b>12</b> treatment for marasmus / AW, has more, (named) nutrients / energy ;</p> <p><b>13</b> marasmus child encouraged to drink as much as possible ;</p> <p><b>14</b> nutrients are required (for children) for, <u>growth</u> ;</p> | <b>6</b> | <p><b>MP 4 A</b> masses of both children crossover / are the same at 16.6 months</p> <p><b>MP 4 A</b> any stated time after 16.5 months</p> |
| 4(d)     | <p><b>1</b> <u>emulsification</u> ;</p> <p><b>2</b> increased surface area of fats ;</p> <p><b>3</b> for lipase ;</p> <p><b>4</b> neutralises (stomach) acid / chyme / provide suitable pH (for lipase) ;</p> <p><b>5</b> speeds up digestion (of fats) ;</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <b>3</b> | <p><b>A</b> description</p> <p><b>A</b> makes chyme alkaline / AW</p>                                                                       |

| Question  | Answer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Marks    | Guidance                                                                                                                                                                                                                                                                                                              |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 5(a)      | <b>1</b> lake / river, pH decreases / acidification ; AW<br><b>2</b> aluminium ions become mobile ;<br><b>3</b> nutrients / named example(s), leached ;<br><b>4</b> shells damaged ;<br><b>5</b> fish / frogs, fail to reproduce ;<br><b>6</b> (aquatic) plants, die / become damaged / AW (from acid) ;<br><b>7</b> disrupts food chains / described ;<br><b>8</b> loss of (bio)diversity / endangered / extinct, species ;<br><b>9</b> acid / low pH / aluminium ions, toxic to / kills / AW, aquatic animals ;<br><b>10</b> fish produce mucus which blocks gills ;<br><b>11</b> AVP ; | <b>5</b> | <b>ecf</b> on 'higher pH'<br><b>MP 3</b> e.g. potassium / calcium / unqualified ions<br><br><b>MP 6 / 9 A</b> kills aquatic organisms = 1 mark<br><b>MP 6 I</b> plant death via eutrophication<br><br><b>MP 9 I</b> low oxygen causes fish death<br><br>e.g. denatured enzymes / described loss of habitat in context |
| 5(b)(i)   | (acid rain often caused by) sulfur dioxide / sulfuric / sulfurous acid ;<br>chlorine / hydrochloric acid, does not cause acid rain ;                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <b>1</b> | <b>I</b> sulfur unqualified                                                                                                                                                                                                                                                                                           |
| 5(b)(ii)  | pH, meter / paper / probe / sensor / AW ;<br>(pH) indicator ;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <b>1</b> | <b>I</b> data logger unqualified<br><b>A</b> named indicator                                                                                                                                                                                                                                                          |
| 5(b)(iii) | warmth ;<br>oxygen ;<br>water / moisture ;<br>AVP ;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <b>2</b> | <b>A</b> heat / temperature<br><br><b>A</b> humidity<br>e.g. conditions that break dormancy of pine seeds: low pH, cold, light qualified, stratification described                                                                                                                                                    |

| Question  | Answer                                                                                                                                                                                                                                       | Marks    | Guidance                                                                                                                                                             |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 5(c)(i)   | (aerobic) respiration / fermentation / metabolic reactions ;<br>heat / energy, is released ;                                                                                                                                                 | <b>2</b> | <b>MP 1 A</b> (named metabolic reaction) e.g.<br>hydrolysis / enzyme activity<br><b>A</b> exothermic reaction / heat produced<br><b>I</b> produce energy unqualified |
| 5(c)(ii)  | denatures enzymes ;                                                                                                                                                                                                                          | <b>1</b> |                                                                                                                                                                      |
| 5(c)(iii) | germination / temperature, increased as, pH increased / acidity decreased ; <b>ora</b><br>no / little, effect / AW, at less than pH 4 ; <b>ora</b><br>comparative data quote between pH and temperature with units stated at least<br>once ; | <b>2</b> | <b>I</b> ref to pH 7.0 as optimum                                                                                                                                    |
| 5(d)      | (Petri dish) <b>2</b> / pH 3.5 ;                                                                                                                                                                                                             | <b>1</b> |                                                                                                                                                                      |

| Question | Answer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Marks                                        | Guidance                                   |                       |   |              |             |   |                    |                                  |   |         |                         |   |                           |                                              |   |                 |                   |   |                            |                           |   |       |         |   |            |                 |   |  |
|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|--------------------------------------------|-----------------------|---|--------------|-------------|---|--------------------|----------------------------------|---|---------|-------------------------|---|---------------------------|----------------------------------------------|---|-----------------|-------------------|---|----------------------------|---------------------------|---|-------|---------|---|------------|-----------------|---|--|
| 6(a)(i)  | cell membrane ;<br>DNA ;<br>ribosomes ;<br>cytoplasm ;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 2                                            | A genes / genetic material / chromosome(s) |                       |   |              |             |   |                    |                                  |   |         |                         |   |                           |                                              |   |                 |                   |   |                            |                           |   |       |         |   |            |                 |   |  |
| 6(a)(ii) | <table><tr><td></td><td><i>white blood cell (S)</i></td><td><i>prokaryote (R)</i></td></tr><tr><td>1</td><td>no cell wall</td><td>cell wall ;</td></tr><tr><td>2</td><td>(named) organelles</td><td>no (membrane-bound) organelles ;</td></tr><tr><td>3</td><td>nucleus</td><td>nucleoid / no nucleus ;</td></tr><tr><td>4</td><td>linear, chromosomes / DNA</td><td>loop of DNA / circular / naked, chromosome ;</td></tr><tr><td>5</td><td>large ribosomes</td><td>small ribosomes ;</td></tr><tr><td>6</td><td>no plasmids (in cytoplasm)</td><td>plasmids (in cytoplasm) ;</td></tr><tr><td>7</td><td>large</td><td>small ;</td></tr><tr><td>8</td><td>antibodies</td><td>no antibodies ;</td></tr></table> |                                              | <i>white blood cell (S)</i>                | <i>prokaryote (R)</i> | 1 | no cell wall | cell wall ; | 2 | (named) organelles | no (membrane-bound) organelles ; | 3 | nucleus | nucleoid / no nucleus ; | 4 | linear, chromosomes / DNA | loop of DNA / circular / naked, chromosome ; | 5 | large ribosomes | small ribosomes ; | 6 | no plasmids (in cytoplasm) | plasmids (in cytoplasm) ; | 7 | large | small ; | 8 | antibodies | no antibodies ; | 3 |  |
|          | <i>white blood cell (S)</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <i>prokaryote (R)</i>                        |                                            |                       |   |              |             |   |                    |                                  |   |         |                         |   |                           |                                              |   |                 |                   |   |                            |                           |   |       |         |   |            |                 |   |  |
| 1        | no cell wall                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | cell wall ;                                  |                                            |                       |   |              |             |   |                    |                                  |   |         |                         |   |                           |                                              |   |                 |                   |   |                            |                           |   |       |         |   |            |                 |   |  |
| 2        | (named) organelles                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | no (membrane-bound) organelles ;             |                                            |                       |   |              |             |   |                    |                                  |   |         |                         |   |                           |                                              |   |                 |                   |   |                            |                           |   |       |         |   |            |                 |   |  |
| 3        | nucleus                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | nucleoid / no nucleus ;                      |                                            |                       |   |              |             |   |                    |                                  |   |         |                         |   |                           |                                              |   |                 |                   |   |                            |                           |   |       |         |   |            |                 |   |  |
| 4        | linear, chromosomes / DNA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | loop of DNA / circular / naked, chromosome ; |                                            |                       |   |              |             |   |                    |                                  |   |         |                         |   |                           |                                              |   |                 |                   |   |                            |                           |   |       |         |   |            |                 |   |  |
| 5        | large ribosomes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | small ribosomes ;                            |                                            |                       |   |              |             |   |                    |                                  |   |         |                         |   |                           |                                              |   |                 |                   |   |                            |                           |   |       |         |   |            |                 |   |  |
| 6        | no plasmids (in cytoplasm)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | plasmids (in cytoplasm) ;                    |                                            |                       |   |              |             |   |                    |                                  |   |         |                         |   |                           |                                              |   |                 |                   |   |                            |                           |   |       |         |   |            |                 |   |  |
| 7        | large                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | small ;                                      |                                            |                       |   |              |             |   |                    |                                  |   |         |                         |   |                           |                                              |   |                 |                   |   |                            |                           |   |       |         |   |            |                 |   |  |
| 8        | antibodies                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | no antibodies ;                              |                                            |                       |   |              |             |   |                    |                                  |   |         |                         |   |                           |                                              |   |                 |                   |   |                            |                           |   |       |         |   |            |                 |   |  |
| 6(b)(i)  | T = antigen ;<br>U = <u>mitosis</u> ; I cell division<br>V = antibodies ;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 3                                            |                                            |                       |   |              |             |   |                    |                                  |   |         |                         |   |                           |                                              |   |                 |                   |   |                            |                           |   |       |         |   |            |                 |   |  |
| 6(c)(i)  | <u>phagocytosis</u> ;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1                                            | A endocytosis                              |                       |   |              |             |   |                    |                                  |   |         |                         |   |                           |                                              |   |                 |                   |   |                            |                           |   |       |         |   |            |                 |   |  |
| 6(c)(ii) | (phagocyte) engulfs pathogen ;<br>phagosome / vacuole, forms ;<br>(enzymes) digest / breakdown / destroy, pathogen ;<br>AVP ;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 1                                            | e.g. antigens presented on cell surface    |                       |   |              |             |   |                    |                                  |   |         |                         |   |                           |                                              |   |                 |                   |   |                            |                           |   |       |         |   |            |                 |   |  |

| Question | Answer                                                                                                                                                               | Marks | Guidance                                                                                             |
|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|------------------------------------------------------------------------------------------------------|
| 6(d)(i)  | incisors ;                                                                                                                                                           | 1     |                                                                                                      |
| 6(d)(ii) | bacteria use sugar / AW (on teeth as a food source) ;<br>bacteria respire ;<br>acid is produced ;<br>AVP ;                                                           | 2     | e.g. plaque / tartar, forms – <i>ref to</i> CO <sub>2</sub> is acidic –<br><i>ref to</i> lactic acid |
| 6(e)     | regular, brushing / mouthwash / flossing / wash / clean, teeth ;<br>avoid sugary foods / diet described ;<br>dental check-ups ;<br>fluoride, toothpaste / in water ; | 2     |                                                                                                      |