![cea Rewarding Learning]

**General Certificate of Secondary Education
2012–2013**

# Science: Single Award

## Unit 1 (Biology)

## Higher Tier

**[GSS12]**

**MONDAY 12 NOVEMBER 2012
1.30 pm–2.45 pm**

# MARK
# SCHEME

**1 (a) (i)**

| | R | r |
|---|---|---|
| **r** | **Rr** | **rr** |
| **R** | RR | **Rr** |

1 – parents [1]
1 – each row F1 [2]
[use ncm for offspring if parents incorrect]

**(ii)** 25%/1 in 4/1:3 [allow ncm] [1]

**(b) (i)** does not change/narrow range/discrete groups/small number of groups [not can be put into groups] [1]

**(ii)** Any example (e.g. eye colour, blood groups, ear lobes, sex) [1]

**(c)** descending curve [1]
levelling out [1] [2]

8

**2 Indicative content**

- (Huge) increase over short time/1800–2000
- Increase more in future
- Increased demand for resources/supplies, e.g. food/will run out quicker
- Increased *pollution*
- Example of *pollution* ×2 e.g. carbon dioxide/sewage/nitrate/more fossil fuels burnt/more global warming [any two of final bullet point]

| Band | Response | Mark |
|---|---|---|
| A | Candidates must use appropriate specialised terms throughout to explain the concern in a logical sequence using 5 or 6 of the IC. SPG, form and style is of a high standard. | [5–6] |
| B | Candidates use some appropriate specialised terms to partially describe the concern using 3 or 4 of the IC. SPG, form and style is of a satisfactory standard. | [3–4] |
| C | Candidates describe the concern using 1 or 2 of the IC. However these are not in a logical sequence. SPG, form, style and use of specialised terms are limited. | [1–2] |
| D | Not worthy of credit. | [0] |

6

**3** **(a)** **(i)** A-microorganisms trapped [1] swan neck/bend [1] could not reach soup [1]/B – not trapped [1] no bend [1] could reach soup [1]
[not just can or cannot cause contamination] [3]

**(ii)** knew to stop microorganisms getting in/cover wounds [1]

**(b)** **(i)** only affect diseases caused by bacteria [1] flu viral [1] [2]

**(ii)** TB/gonorrhoea/salmonella/chlamydia/MRSA/tonsillitis/meningitis/
acne/tetanus [1]

7

**4** **(a)**

| Differences | Voluntary | Reflex |
|---|---|---|
| speed of response | *slow/varies* | *fast* |
| response to stimulus | *varies* | *always the same* |

$\frac{1}{2}$ mark each response, rounded down [2]

**(b)** (sound) receptors/ear sends signal [1] signal to coordinator/brain [1] effector/muscles [1]
*or* sensory neurone [1] sends signal to relay neurone [1] sends signal to motor neurone [1] [3]

**(c)** slows reactions/depressant [1]
quicker/more alert/stimulant [1] [2]

7

**5** **(a)** 90% [1]

**(b)** Group two more effective (as reduced more)
[not just reference to or quoting figures] [1]

**(c)** bigger drop for female groups than men [1]
bigger drop initially [1]
did not stop all of the women [1] [3]

**(d)** small numbers [1]
short time [1] [2]

7

**6** **(a)** protect (species) numbers [1] protect habitat [1] protect food supply [1] less pollution [1] no fishing [1] no wind turbines [1]
[not just protected on own] *Any* 3 [3]

**(b)** restricts operations/financial implications [1]

**(c)** **(i)** biodiversity [1]

**(ii)** economic benefits e.g. food/clothing/shelter/fuel/medicines
ecological/recreational/cultural/aesthetic *Any* 2 [2]

7

**7** land – recycling/reducing/reusing/any valid [1]
land/water/air – scrubbers/desulphurisation methods/catalytic converters/
renewable sources/alternative energy [1]
water – reduce use of fertilisers/do not use when raining/any valid [1]     [3]

3

**8** **(a)** **Indicative content**

* 19% to 35% ($+/-1$) or doubled/it increases and decreases
* Plants (evolved)
* Photosynthesis started/$O_2$ produced
* Animals (evolved)
* Animal respiration possible
* Uses oxygen

| Band | Response | Mark |
|---|---|---|
| A | Candidates must use appropriate specialist terms throughout to describe **five or six** points above. They use good spelling, punctuation and grammar and the form and style are of a high standard. | [5–6] |
| B | Candidates use some appropriate specialist terms to describe **three** or **four** of the points above in a logical sequence. They use satisfactory spelling, punctuation and grammar and the form and style are of a satisfactory standard. | [3–4] |
| C | Candidates describe **one or two** of the above points. However, these are not presented in a logical sequence. They use limited spelling, punctuation and grammar and they have made little use of specialist terms. The form and style are of a limited standard. | [1–2] |
| D | Response not worthy of credit. | [0] |

[6]

**(b)** denied role of God/uniqueness of man/reduced power   *Any* 2     [2]

8

**9** **(a)** **(i)** worked together/helped each other     [1]

**(ii)** 3D structure/spiral shape/helix shape/bases inside [1] x-ray
diffraction [1]     [2]

**(b)** **(i)** Watson and Crick     [1]

**(ii)** Equal <u>amounts</u> [1] A and T/C and G [1]
[A = T and C = G; 2 marks]     [2]

6

**10 (a) (i)** decay/decomposition [1]
nitrification [1]                                                                      [2]

**(ii)** (over)farming/deforestation/(any valid answer that implies man stopping decomposition) [1] with suitable explanation [1]                    [2]

**(b)** increase in combustion/use of fossil fuels [1] more $CO_2$/global warming/greenhouse effect [1] deforestation/reduced photosynthesis [1]                                                             [3]    7

**11 (a) (i)** sisters                                                                      [1]

**(ii)** person 4 – Cc [1]
person 6 – cc [1]                                                                      [2]

**(iii)** 25%/1 in 4/1:3                                                                 [1]

**(b) (i)** extra chromosome [1] 21st pair [1]                                          [2]

**(ii)** cf. one allele/gene affected [1] one amino acid/protein affected [1] Down syndrome many genes affected [1] many amino acids/ proteins affected [1]                                     *Any* 3   [3]    9

**Total**    **75**