



Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

BIOLOGY

0610/03

Paper 3 Theory (Core)

For Examination from 2016

SPECIMEN MARK SCHEME

1 hour 15 minutes

MAXIMUM MARK: 80

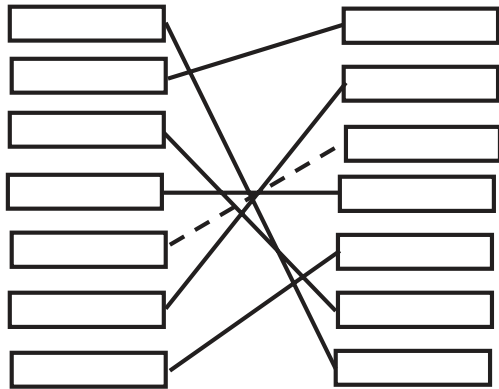
The syllabus is accredited for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.

This document consists of **7** printed pages and **1** blank page.

mark scheme abbreviations

| | |
|--------------------|-----------------------------------------------------------------------------|
| ; | separates marking points |
| / | alternative responses for the same marking point |
| not | do not allow |
| allow | accept the response |
| ecf | error carried forward |
| avp | any valid point |
| ora | or reverse argument |
| owtte | or words to that effect |
| underline | actual word given must be used by candidate (grammatical variants excepted) |
| () | the word / phrase in brackets is not required but sets the context |
| max | indicates the maximum number of marks |
| Any [number] from: | accept the [number] of valid responses |
| note: | additional marking guidance |

1 one mark for each correct link



[6]

2 (a) (i) mammal;

[1]

(ii) hair;

external ears;

[2]

(b) (i) Any two from:

habitat loss / deforestation;

competition from humans / owtte;

hunting;

avp (e.g. pollution / diseases);

[max 2]

(ii) Any two from:

increasing numbers; allow: idea that breeding in captivity produces

more offspring / less infant mortality

for later reintroduction to wild;

avp;

[max 2]

(iii) Any two from:

monitoring / protecting habitats;

monitoring / protecting species (from hunting etc.);

education;

seed banks;

avp;

[max 2]

3 (a) X – placed clearly on oviduct;

allow: X with label line clearly indicating oviduct

[1]

(b) A – transfer of nutrients from mother to fetus / transfer of oxygen from mother to fetus /
removal of CO₂ from fetus to mother / removal of waste from fetus to mother;

note: direction of transport must be clear

B – carries fetal blood to and from the placenta;

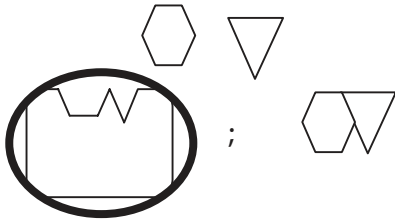
[2]

(c) C – contracts to push baby (out);

D – dilates to allow exit of baby / owtte;

[2]

4 (a)



allow: labels on enzyme or on label line to enzyme [1]

- (b) (i) speeds up / increases the rate of a chemical reaction;
is not changed by the reaction / owtte; [2]
- (ii) without enzymes reactions would be too slow to sustain life / owtte; [1]

5 (a) (Arctic) plant(s) → lemming(s) → (snowy) owl(s);

note: arrows must be in the correct direction

ignore refs. to energy / Sun / light as long as they are before plants [1]

(b) (i) increasing numbers of lemmings reproducing / owtte; [1]

(ii) Any two from:

snowy owl population increasing;

thus more predation / more lemmings eaten;

lemming population too large for food supply / owtte; [max 2]

(iii) Any three from:

as lemming population falls / rises so does the snowy owl population;

but with a time delay;

because of less / more food for the snowy owls;

avp; (e.g. explanation of time delay) [max 3]

(iv) Any three from:

lemming population would increase / reach a peak;

because of less predation;

(after peak) levels off / falls;

equilibrium with plants / food / other factors coming into play / owtte;

too many lemmings for food supply to support / owtte; [max 3]

(c) (i) the Sun; [1]

(ii) photosynthesis; [1]

- 6 (a)** pathogen; [1]
- (b)** Any two from:
 sneeze / cough; allow: through blood / body fluids
 droplets;
 airborne;
 inhaled;
 contact / on skin / surfaces; [max 2]
- (c)** Any three from:
 mechanical barriers / chemical barriers;
 stomach acid kills pathogens;
 skin keeps out pathogens / owtte;
 hairs in nose trap pathogens / owtte;
 sticks to / trapped in, mucus (in mouth / nose / lungs);
 cilia;
 phagocytosis (by white blood cells);
 antibodies produced (by white blood cells); [max 3]
- (d)** (influenza is) a virus / viral / (not bacterial) / owtte;
 antibiotics don't destroy (viruses) / only destroy bacteria / owtte; [2]
- 7 (a) (i)**
- | | | |
|---------------------------|----------------|-----|
| petal | J ; | |
| anther | F ; | |
| stigma | H ; | |
| a male part of the flower | F ; | |
| part of the carpel | G / H ; | |
| sepal | E ; | [6] |
- (ii)** Any two from:
 large petals;
 anthers or stigmas inside the petals;
 allow: refs. to lack of adaptations for wind pollination, e.g. no feathery stigma / no drooping anthers; [max 2]
- (b) K, L, N, P**;
 4 correct = 2 marks
 3 correct = 1 mark
 all correct but with 1 additional letter = 1 mark
 all correct but with 2 or more additional letters = 0 marks [2]

- 8 (a) (i) yeast / *Saccharomyces cerevisiae* / *Saccharomyces* / *S. cerevisiae* / other microorganisms that can respire sugars to give ethanol; [1]
- (ii) anaerobic;
respiration;
allow: fermentation for 1 mark [2]
- (b) Any two from:
fossil fuel non-renewable;
(sugar cane) renewable / sustainable;
combustion of fossil fuel releases carbon dioxide;
burning plants releases no net carbon dioxide / is carbon neutral / owtte; [max 2]
- 9 (a) (i) nutrition / ingestion / feeding; [1]
- (ii) decomposers / bacteria / fungi; [1]
- (iii) Any two from:
T;
V;
W; [max 2]
- (iv) S; [1]
- (b) glucose + oxygen;
carbon dioxide + water; [2]
- (c) Any three from:
more combustion / use of fossil fuels (for heat / power);
allow: refs. to homes, factories, electricity production
more use of (fossil fuels for) vehicles;
allow: for vehicles / any named type, e.g. cars
larger human population respiring;
allow: refs. to increased human population
deforestation / owtte;
leading to less photosynthesis;
burning / decay of cut down materials; [max 3]
- 10 (a) (i) liver; [1]
- (ii) straight line extending from X – Y;
9–10; [2]
- (b) (i) Any one from:
slower reaction time / slower reactions;
depressant;
reduced self-control; [max 1]

(ii) Any two from:

liver damage;

addiction;

slower reaction time / reactions;

depressant;

reduced self-control;

note: only accept answers not credited in (b)(i)

ignore refs. to social problems, e.g. family breakdown / work difficulties / crime [max 2]

11 (a) version of a gene / owtte; [1]

(b) (allele for) red (flowers);

allow: **R**

[1]

(c) (i)

| | | | |
|----------|--|-----------|-------------|
| | | R | r ; |
| R | | RR | Rr |
| r | | Rr | rr ; |

all alleles correct; – allow: **r** before **R**

all offspring genotypes correct and must derive from alleles;

[2]

(ii) 3 red : 1 white;

note: colour must be specified

[1]

