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General Certificate of Secondary Education
2016–2017

Double Award Science: Biology

Unit B1

Foundation Tier

[GSD11]

WEDNESDAY 9 NOVEMBER 2016, MORNING

MARK
SCHEME

General Marking Instructions

Introduction

Mark schemes are published to assist teachers and students in their preparation for examinations. Through the mark schemes teachers and students will be able to see what examiners are looking for in response to questions and exactly where the marks have been awarded. The publishing of the mark schemes may help to show that examiners are not concerned about finding out what a student does not know but rather with rewarding students for what they do know.

The Purpose of Mark Schemes

Examination papers are set and revised by teams of examiners and revisers appointed by the Council. The teams of examiners and revisers include experienced teachers who are familiar with the level and standards expected of students in schools and colleges.

The job of the examiners is to set the questions and the mark schemes; and the job of the revisers is to review the questions and mark schemes commenting on a large range of issues about which they must be satisfied before the question papers and mark schemes are finalised.

The questions and the mark schemes are developed in association with each other so that the issues of differentiation and positive achievement can be addressed right from the start. Mark schemes, therefore, are regarded as part of an integral process which begins with the setting of questions and ends with the marking of the examination.

The main purpose of the mark scheme is to provide a uniform basis for the marking process so that all the markers are following exactly the same instructions and making the same judgements in so far as this is possible. Before marking begins a standardising meeting is held where all the markers are briefed using the mark scheme and samples of the students' work in the form of scripts. Consideration is also given at this stage to any comments on the operational papers received from teachers and their organisations. During this meeting, and up to and including the end of the marking, there is provision for amendments to be made to the mark scheme. What is published represents this final form of the mark scheme.

It is important to recognise that in some cases there may well be other correct responses which are equally acceptable to those published: the mark scheme can only cover those responses which emerged in the examination. There may also be instances where certain judgements may have to be left to the experience of the examiner, for example, where there is no absolute correct response – all teachers will be familiar with making such judgements.

1 DCPIP;
blue to colourless/blue to pink to colourless; **not** blue → pink
protein;
blue to purple;
sugar/glucose;
Benedict's [6]   6

2 (a) (i) low fitness [1]

      (ii) Any **two** from:
high blood pressure; high cholesterol; diabetes [2]

      (iii) 1st mark: 4% from graph
2nd mark: 27 000 or $\left(\dfrac{54\,000}{2}\right)$
3rd mark: ÷ 100 × 27 000/1080
correct answer = [3] marks [3]

  (b) high blood glucose/sugar/glucose in the urine/lethargy/thirst
drinking lots of water/frequent toileting [1]

  (c) •   lack of time to exercise
    •   smoking difficult to stop/don't want to stop
    •   difficult to change diet/don't want to change diet
    •   don't care/don't believe results
    •   study is in America
    •   already taking medication/HBP/cholesterol/diabetes
    •   don't think they have the risk factor (or named) [1]   8

3 (a) (i) killl the leaf/stop the reactions [1]

      (ii) remove chlorophyll/remove green colour [1]

      (iii) alcohol is flammable [1]

      (iv) green part/**centre** of leaf → **blue-black** or black on its own;
white/**outer** part of leaf → **yellow/brown**;
no chlorophyll/no chloroplasts in the white part/or chloroplasts in
green part/ chlorophyll only in middle/starch found in green (centre)
part but not white (edges) [3]

  (b) (i) 0.07/0.069;
maximum photosynthesis for least carbon dioxide/any additional
carbon dioxide is a waste/tomatoes won't P.S. more/rate won't
increase more/P.S. won't happen faster [2]

      (ii) cost of adding carbon dioxide/whether make enough money to cover
CO_2 cost/enough profit [1]   9

AVAILABLE MARKS

4 **(a)** trees → caterpillars → mice → foxes
[1] for organisms in correct order;
[1] for arrows correct direction [2]

(b) mice [1]

(c) **(i)**

| foxes |
| mice |
| caterpillars |
| trees |

[1] for bottom box trees smaller than caterpillars box and labelled;
[1] for foxes above mice and smaller box for foxes and labelled; [2]

(ii) add fleas at top and bigger box [1]

(d) Any **two** from:
heat/respiration;   **not**: digestion on own/eating/not all mice are eaten
movement;
excretion/egestion/waste materials/incomplete digestion;
reproduction;
uneaten structures; [2]

(e) **(i)** 100 + 4 – 60 – 20 or 104 – 80;
+ 24;
200 + 24 = 224;
correct answer, award [3] marks [3]

(ii) old age/disease/lack of food/more foxes/eaten by foxes/cold/
predators/too hot or cold/extreme weather
not weather changes on own [1]

5 **(a)** Any **three** from:
put down transect line/tape/string/belt transect/line/described;
use quadrat;
at different distances/placing of quadrats front to back of dunes/sampling
across the dunes;
measure % cover marram grass in each quadrat/measure marram grass in
quadrat; [3]

(b) **(i)** increases then decreases/increases then exception/anomaly at 40 [1]

(ii) salt content 2.5;
pH 8.1; [2]

(c) pH paper/pH probe or pH sensor/soil testing kit/universal indicator/
pH meter/pH indicator [1]

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(d) animals or named, e.g. snails eating marram grass/disease/
competition (from other species)/organisms that feed on the marram grass/
humans/predators/insects [1]

6 **(a)** Accept:
- one Petri dish into box; ⎱ Petri dish; with lamp
- shine lamp from one side ⎰ from one side
- take 2nd Petri dish;
- shine light from above/put into box with opening only at the top;
- carry out for a set time/specific time given;
- record results

Band	Response	Mark
A	Candidates use appropriate terms throughout to give at least five points from the indicative content. They use good spelling, punctuation and grammar skills. Form and style are of a high standard.	[5]–[6]
B	Candidates use appropriate terms throughout to give at least three or four points from the indicative content. They use satisfactory spelling, punctuation and grammar. Form and style are of a satisfactory standard.	[3]–[4]
C	Candidates use appropriate terms throughout to give 1 or 2 points from the indicative content. They use limited spelling, punctuation and grammar and have made little use of specialist terms.	[1]–[2]
D	Response not worthy of credit.	[0]

[6]

(b) seedlings grow straight up with light from above;
seedlings in box grow to side with the hole/or to where light coming
from; [2]
one bent to light and other straight = [1]

(c) Any **two** from:
- type/variety/species/number/size of seedling;
- time;
- distance of lamp from seedlings/light intensity/bulbs/brightness;
- temperature/heat
- water [2]

(d) **(i)** tip [1]

(ii) auxin [1]

7 **(a) (i)** Accept:
1st mark: lignin;
2nd and 3rd mark: can be 'comparison + 1 data' or '2 data'

comparison
most/more remaining (after 15 weeks) than starch/cellulose
or
starch/cellulose have much less remaining (after 15 weeks)
or
only starts to be broken down after 10 weeks/only starts to break
down at 15 weeks

data
lignin: 90% remaining after 15 weeks
             10% broken down after 15 weeks

starch: 90% broken down at 15 weeks
             10% remaining after 15 weeks
             80% more starch (than lignin) broken down at 15 weeks

cellulose: 40% broken down by 15 weeks
             60% remaining after 15 weeks
             30% more remains after 15 weeks   [3]

(ii) type 2   [1]

(iii) 90/60/30 = 1 mark;
6 = 2 marks;   [2]

(iv) glucose   **not** sugar   [1]

(b) (i) root hair (cells)   [1]

(ii) water/H_2O [1]

(iii) amino acids/proteins   [1]

(c) (i) Any **three** from:
long;
folds;
villi;
microvilli;   [3]

(ii) Any **two** from:
short diffusion distance/thin/one cell thick/thin wall/thin lining
not cell wall
permeable;
moist;
good blood supply/diffusion gradient/described blood supply,
e.g. good network of capillaries;   [2]

                                                                      15

                                                              Total

                                                                      70

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