



**Rugby  
School**

**Biology**

**Sixth Form Examination 2015**

**Mark Scheme**

# Sixth Form Specimen Examination Mark Scheme - Biology

## Section A

Q1	B	Q5	C	Q9	A	Q13	A	Q17	D
Q2	D	Q6	A	Q10	A	Q14	B	Q18	C
Q3	B	Q7	B	Q11	C	Q15	C	Q19	B
Q4	D	Q8	B	Q12	A	Q16	B	Q20	D

## Section B

### Q1.

- a. Photosynthesis
- b. Water vapour/Nitrogen/Argon/Hydrogen/Methane/Neon/Helium
- c. Provides light, carbon dioxide and water required for photosynthesis
- d. Iodine
- e. L = inner Black/purple, outer yellow/brown;  
M = inner and outer yellow/brown;  
N = inner and outer yellow/brown;
- f. L = Greater rate of photosynthesis than respiration;  
Therefore net increase of carbon dioxide;  
  
M = No photosynthesis as all carbon dioxide absorbed;  
CO<sub>2</sub> produced by respiration also absorbed so remains 0;  
  
N = No photosynthesis as no light so no CO<sub>2</sub> consumption;  
CO<sub>2</sub> increases due to production through respiration;

### Q2.

- a. Arrow pointing towards the shoot
- b. Transpiration of water from leaves;  
Causes water to be pulled up the stem as a column due to cohesion of water molecules;
- c. Scale linear and plot takes up min 50% of grid provided;  
Line drawn with a ruler joining points, no extrapolation;  
Axes correct way round and labelled correctly;  
Points plotted accurately (+/- 0.5mm);  
Units stated on both axes;

### Q3.

#### Scientific content

#### General

Homeostasis correctly defined (1 mark)

Importance of maintaining a constant internal environment explained (2marks)

Minimum three examples covered, 4 marks available for each.

**Expected topics, content and key terms:**

**Blood glucose regulation**

Role of the pancreas described in detection of blood glucose and production of glucagon and insulin

Response of the liver to insulin and glucagon relating to conversion between glucose and glycogen

Pointing out that the mechanism of control is entirely hormonal

**Thermoregulation**

State core temperature set point of 37.5°C

The role of the hypothalamus in detecting blood temperature

Nervous communication with effectors; impulses along neurons

Vasodilation/constriction described referencing the effect of heat loss by convection, conduction and radiation

The effect of sweating, cooling by evaporation transferring heat away from blood

Shivering described, mentioning the release of heat from respiration

**Osmoregulation.**

Role of the Hypothalamus in detecting changes in water concentration (water potential) of the blood

Nervous communication to pituitary gland

Anti-diuretic hormone (ADH) release and its effects on the permeability collecting duct in the kidney described

Resulting changes in urine concentration stated and link to the maintaining a constant blood water concentration

Combination of hormonal and nervous communication

**Marking guidance for each example**

1 mark            Topic mentioned and some knowledge of the process demonstrated. Few key terms used gaps in knowledge and errors may be present

2-3 marks        A good overview of the topic with use of key terms. Few omissions present and few errors

4 marks            Excellent description of the process, no errors, minor omissions only and mastery of the key terms demonstrated

**Spelling, punctuation and grammar**

More than 3 errors loses SPG mark

**Structure, Style and coherence**

Clear introduction and conclusion (1 mark)

Examples dealt with in isolation = 1 mark

**Or**

Examples compared, or linked = 2marks