

## MARK SCHEME for the October/November 2008 question paper

### **5090 BIOLOGY**

**5090/06**

Paper 6 (Alternative to Practical), maximum raw mark 40

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began.

All Examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes must be read in conjunction with the question papers and the report on the examination.

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- 1 (a) by watering;  
by covering seedling/leaves (with a bag etc.);  
A: vaseline/shade/darkness. R: cold/negatives.
- (b) (i) water absorbed until no more available;  
transpiration/evaporation/surface loss (continues);  
seedling/cells lose water/become flaccid; [up to 2]
- (ii) root hairs damaged/broken;  
so that no water absorbed; [2]  
root hairs once in (ii) or (iii), otherwise A: root
- (iii) new root hairs grow (overnight); [1]  
R: ref conditions.
- (iv) fertiliser solution reduced water potential (in soil); [2]  
making endosmosis impossible (AW);
- (v) give seedling/surrounding soil, [1]  
more water/raising external water potential;  
R: if fertiliser mentioned.
- (c) Two key points needed:  
range of concentrations (of fertiliser solutions) prepared;  
at least 3 days for results to show;
- With up to three more marks from:  
seedlings grown in pots/other containers;  
name of plant/fertiliser used;  
uniform size;  
uniform condition(s), etc.;  
how fertiliser applied/used for watering, etc.;  
replication;  
result recording/tabulation; [up to 5]
- [Total: 15]

- 2 Colour of contents:
- (i) **A1 (a)** blue; **A1 (b)** blue; **A2** (blue)-black; [3]  
For **A2** accept iodine colour, brown, orange
- (ii) Table 2.1 – conclusions  
**A1 (a)**: reducing sugar/glucose present;  
**A1 (b)**: no protein/protein absent; [3]  
**A2**: starch present;
- (iii) Table 2.2 – conclusions  
**B1 (a)**: no reducing sugar/glucose;  
**B1 (b)**: protein present;  
**B2**: fat (oil)/lipid present; [3]

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(iv) chopping increases surface area/releases cell contents;  
 dissolved in ethanol;  
 water added to complete test;  
 if water added to original, ethanol goes milky/AW; [up to 2]

[Total: 11]

3 (a) (i) blood; [1]

(ii) leucocyte/wbc/polymorph/granulocyte/phagocyte/lymphocyte;  
 erythrocyte/rbc;  
 platelet;  
 plasma; R: serum, etc. [4]

(iii) Drawing marks:  
 1. at least 5 cm, realistic, clear and clean lines.  
 2. accurate nucleus – 3 main lobes. [D.2]

Labels: nucleus;  
 cytoplasm/cell membrane; R: if cell wall shown [2]

(iv) both dimensions accurate, with units at least once;  
 R: if no indication on drawing where measured.  
 [10 mm ± 1 mm/1.0 cm ± 0.1 cm on Fig. 3.1]  
 correct expression – drawing over image ; [e.g. 50/10]  
 allowance for × 750;  
 correctly stated mag; [750 × 5 = ] × 5 / × 3750  
*[must be whole number for 3000 +,*  
*up to 2 d.p. and 0.2 rounding if no allowance for × 750]* [4]

(b) (i) transport of oxygen; [1]

[Total: 14]