UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the October/November 2008 question paper

0610 BIOLOGY

0610/06 Paper 6 (Alternative to Practical), maximum raw mark 40

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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.

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International Examinations

1 (a) (i)

	egg in water	egg in salt solution
size	larger / bigger / increased / check measurement + units if given *I turgid; normal; same; no change*	smaller / shrunk / decreased check measurement + units if given; *I flaccid*
position in liquid	not floating / sunk / on the bottom / low / goes down	floating / in the middle / suspended / goes up and down / AW; *I half submerged*
external appearance of the egg	smooth / oval / round / turgid / regular *I intact / harder / firm / same as / normal*	wrinkled / uneven / rough / flaccid / uneven / zigzagged / irregular / lumpy / bumpy / deformed / distorted ; *I soft*

allow 1 mark per row.
ignore reference to weight / mass / density. [3]

(ii) 1. <u>osmosis</u>;

2. in water gained water; *(direction of movement in correct solution)*
[if refer to endosmosis – marking points 1 and 2]

3. water surrounding egg higher water potential / less solutes / more dilute / AW than inside egg / water gradient / water potential gradient / hypotonic hypertonic / water concentration; *[accept if in correct context]*

4. in salt solution – lost water; *(direction of movement in correct solution)*
[if refer to exosmosis – marking points 1 and 4]

5. solution surrounding egg lower water potential / more solutes / more concentrated in solutes / water potential gradient / hypotonic / hypertonic / AW than egg;
[allow 1 mark for saying the opposite without giving full details for marking points 4 and 5]

6. membrane is partially permeable / AW;

7. AVP e.g. referring to floating / sinking / shape changes in respective solutions;
please record number for point awarded beside tick.
ignore reference to weight / mass / density. [max 5]

(b) (i) S both axes scaled evenly to use more than half the grid for the line;
P plot points accurately; *[+/- ½ small square]*
L line of best fit / points joined by ruled line;

Bar chart or histogram S and P (check column heights) Max 2.
Use letters S, P and L to record ticks or Xs in that sequence. Allow minor extrapolation of line especially with line of best fit. [3]

(ii) check graph for answer but need correct units +/– 0.5g dm^3 or g / dm^3 or g dm^{-3}; cannot award for bar charts and histograms. [1]

(iii) 1. water entering = water leaving / no net water movements / water not gained or lost;

2. balanced concentration / isotonic/ equal / equilibrium / ψ are equal / amount of salt water / water is equal;

3. no osmosis / no diffusion of water / no water potential gradient / no concentration gradient / AW; *[this is an easy mark to gain]* [3]

(c) 1. biuret test / Millon's test / xanthoproteic test;

2. add biuret A / biuret 1 / sodium / potassium hydroxide / NaOH / KOH **and** biuret B / biuret 2 / copper sulphate / Millons reagent [contains mercury] and needs heat / xanthoproteic [contains nitric acid] and heat;

3. same quantity of reagent *(independent of correct reagent)*;

4. equal sample; I *reference to grinding egg or cooking egg.*

5. purple / lilac / mauve (or red for Millon's) (yellow for xanthoproteic);

6. darker / deeper / richer / AW purple / red / yellow with more protein or *vice versa* paler for less protein; *[accept even if wrong colour is rejected for marking point 6]*

I *time references.*

7. AVP e.g. colour of yolk interferes with end result; [max 4]

[Total: 19]

2 **(a)** 1. respiration / fermentation of yeast cells; *I reference to aerobic / anaerobic*.

2. producing / releasing carbon dioxide;

3. carbon dioxide causes solution / indicator becoming acidic / yellow;
[needs mention somewhere of carbon dioxide but do not award for concept that carbon dioxide is acidic alone] [3]

(b) 1. use a set volume of yeast culture; *[accept 20 cm^3]*

2. temperature controlled water bath / at room temperature;

3. means of collecting gas – gas syringe / inverted gas cylinder or syringe or gas jar or measuring cylinder full of water / test tube;
[ignore counting bubbles / height of foam]

4. reference to timing;

5. repeat measurements;

6. calculate average;

7. airtight apparatus to stop leakage / putting in a bung;

8. shake culture (so cells do not settle);

9. AVP (e.g. reference to adding sugar); [max 6]

(c) **(i)** O clear outline representation of yeast cell and more than 8 cm;
must have a bud, *I minor shading*,
D double line for cell wall; *[bud should not be cut off with cross wall]*
L label one from: nucleus / vacuole / nucleolus / cell membrane / mitochondrion / cytoplasm / ribosome / cell wall / daughter cell or bud / mother cell;
ring the accepted label and use letters O, D and L for ticks. [3]

(ii) size of cell measured on Fig. 2.2 between X and Y between 8.0 and 8.2cm or 80 and 82mm (units essential);

$$\frac{\text{drawing}}{\text{Fig. 2.2}} = \text{magnification (allow even if forget} \times 5000)$$

allow ecf.
answer (needs to involve $\times 5000$ and no units given); [3]

[Total: 15]

3 **(a)** correct lines to structure shown in Fig. 3.1
a chromosome or **(i)**;

cytoplasm or **(ii)**;

nucleus or **(iii)**; [3]

(b) **(i)** anthers / pollen sacs / ovary / ovules; [1]

(ii) ovary / follicle / testis(es) / oviduct / fallopian tube;
I reproductive organs. [1]

(c) maintain chromosome **diploid** number on fertilisation;

reference to **haploid** gametes reference to 23 chromosomes;

variation;

when gametes fuse the correct chromosome number is attained;
[answers are sometimes difficult to follow – read through whole answer and dredge] [max 1]

[Total: 6]