

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

### **0610 BIOLOGY**

**0610/02**

Paper 2 (Core Theory), maximum raw mark 80

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.

- CIE will not enter into discussions or correspondence in connection with these mark schemes.

CIE is publishing the mark schemes for the October/November 2008 question papers for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level syllabuses and some Ordinary Level syllabuses.



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### General notes

Symbols used in mark scheme and guidance notes.

/ separates alternatives for a marking point

; separates points for the award of a mark

MP mark point – used in guidance notes when referring to numbered marking points

ORA or reverse argument/reasoning

OWTTE or words to that effect

R reject – this is marked with a cross and any following correct statements do not gain any marks

I ignore/irrelevant – this response gains no mark, but any following correct answers can gain marks.

( ) the word/phrase in brackets is not required to gain marks but sets context of response for credit. e.g. (waxy) cuticle. Waxy not needed but if it was described as a cellulose cuticle then no mark.

Small underlined words – this word only

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		Guidance
1	<p>(a) genus – <i>Elephas</i> species – <i>maximus</i>; [1]</p> <p>(b) (i) <b>EITHER</b> (Bob)cat; European (lynx); Iberian (lynx); any two – 1 mark each</p> <p><b>OR</b> jaguar; leopard; lion; tiger; any two – 1 mark each [2]</p> <p>(ii) <i>Acinonyx</i>; [1]</p> <p style="text-align: right;"><b>[Total: 4]</b></p>	<p>A – <i>elephas</i> (<i>lower case e</i>) both responses needed for the single mark.</p> <p>the first response identifies the selected genus (<i>Lynx or Panthera</i>). the second must be from the same genus to gain the second mark.</p> <p>I – scientific names</p> <p>I – <i>jubatus</i> I – cheetah</p>
2	<p>(a) (i) smoking/cigarettes/tobacco; [1]</p> <p>(ii) smoking/cigarettes/tobacco; the % of smokers is higher than in non-smokers/ ORA; in both day and night groups/OWTTE; the difference is 3.4(%) Any 3 – 1 mark each [3]</p> <p>(iii) 1.3%; greater amount of traffic during the day/ OWTTE; [2]</p> <p>(b) (i) nicotine; acts as a stimulant drug/raises heart rate/ raises blood pressure/is addictive;</p> <p>tar; is carcinogenic/can cause cancers/ named cancer/(is an irritant and) can increase mucus production/cause bronchitis/ coughing/emphysema;</p> <p>smoke particles; (is an irritant and) can increase mucus production/cause bronchitis/coughing/ emphysema;</p> <p>any two pairs – 2 marks each [4]</p>	<p>I – smoke</p> <p>A – numbers must refer to day and night drivers</p> <p>A – ORA</p> <p>if no component named then no mark can be awarded for effect A – OWTTE for addictive</p> <p>named cancer must be relevant</p>

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<p>(ii) baby born with lower birth weight/smaller/ underdeveloped/fetus receives reduced oxygen supply/baby born with nicotine addiction; [1]</p> <p style="text-align: right;"><b>[Total: 11]</b></p>	<p>A – poor brain development</p>
<p><b>3 (a)</b> strontium accumulates in same tissues as calcium/ OWTTE; such as bones/teeth; [2]</p> <p><b>(b)</b> 1 radiation can damage/change nuclei/ chromosomes/genes/DNA; 2 can cause mutations; 3 can lead to cancers/abnormal cell multiplication; 4 can lead to abnormal/malfunctioning cells/ destroys cells; any three – 1 mark each [3]</p> <p style="text-align: right;"><b>[Total: 5]</b></p>	<p>A – named tooth or bone</p> <p>MP3 A – tumour/relevant named cancer</p>
<p><b>4</b> gene; <u>meiosis</u>; diploid; recessive; heterozygous; [5]</p> <p style="text-align: right;"><b>[Total: 5]</b></p>	<p>R – allele only accept terms from the list</p>
<p><b>5 (a)</b> <b>P</b> – penis; <b>Q</b> – <u>urethra</u>; <b>R</b> – sperm duct/vas deferens; [3]</p> <p><b>(b) (i)</b> <b>S</b> to label the testis; [1]</p> <p><b>(ii)</b> <b>T</b> to label the testis; [1]</p>	<p>A – erectile tissue only credit correct spelling I – sperm tube</p> <p>in both responses the label line must go clearly to testis not epididymis A – a single label line linked to both <b>S</b> and <b>T</b> = 2 marks 2 or more labels for <b>S</b> or <b>T</b> then all must be correct to gain each mark A – letters on testis (if they overlap onto epididymis then award if bulk of letter is on testis)</p>

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<p>(c) 1 (stimulate) production of sperm; 2 growth/development of pubic/axillary hair; 3 growth/development of facial/body hair; 4 breaking of the voice/OWTTE; 5 widening of shoulder (girdle); 6 development of more muscle/more muscular; 7 increased aggressive behaviour/OWTTE; 8 growth of penis; any two – 1 mark each [2]</p>	<p>MP2 &amp; 3 R – hair unqualified MP2 &amp; 3 no credit for ref. to hair on scalp MP4 I – change of voice  MP8 I – enlargement (could be ref. to erection)</p>
<p>(d) across placenta/mixing of blood during birth; from (infected) mother to fetus/baby; (infected person pierced by) “sharp”/needle/ blade etc; used while still infected/not sterilised before reuse; collection/donation of infected blood/blood to blood transfer; transfused/passed into uninfected patient; any two pairs – 2 marks each [4]</p>	<p>A – reference to any relevant sharp item/process e.g. tattooing It is important that it is clear that the “sharp” is still contaminated.  It is important that the transfer is to an uninfected person.</p>
<p><b>[Total: 11]</b></p>	
<p>6 (a) (i) 1 base to be wider than layer above; 2 third layer to be wider than second layer and top layer to be narrower again; 3 layers to be named grass, (cape) buffalo, ticks, (oxpecker) bird – in ascending order; [3]  (ii) 4 layers to successively narrow from base to top; named as (trophic levels) 1 to 4/producers, first consumers/herbivores, second consumers/(1<sup>y</sup>) carnivores, third/top consumer/(2<sup>y</sup>) carnivores – in ascending order; [2]</p>	<p>MP2 third layer not to be same width or wider than first layer  A – parasites for ticks  I – primary in relation to producer  A – tertiary</p>

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<p><b>(b)</b> 1 consumers require ready made food/supply of chemical energy;</p> <p>2 gain it by feeding/eating/digestion of other organisms;</p> <p>3 producers make food from raw materials/for themselves;</p> <p>4 by photosynthesis/trapping light energy/ converting light to chemical energy;</p> <p>any three – 1 mark each [3]</p> <p style="text-align: right;"><b>[Total: 8]</b></p> <p><b>7 (a) (i)</b> <b>A</b> – combustion; <b>B</b> – respiration; <b>C</b> – photosynthesis; <b>D</b> – digestion/feeding/eating/assimilation; [4]</p> <p><b>(ii)</b> bacteria/fungi; [1]</p> <p><b>(b)</b> 1 (increased) use of fossil fuels/OWTTE;</p> <p>2 due to (more) energy demands/(increased) use of vehicles;</p> <p>3 decreased photosynthesis;</p> <p>4 due to deforestation/destruction of vegetation;</p> <p>5 respiration from increased (world) population;</p> <p>any three – 1 mark each [3]</p> <p style="text-align: right;"><b>[Total: 8]</b></p> <p><b>8 (a) (i)</b> <b>D</b>; [1]</p> <p><b>(ii)</b> a pair of muscles; pulling/effect of muscles acting/working in opposite directions/OWTTE; [2]</p> <p><b>(b) (i)</b> a rapid/fast/immediate/instantaneous; automatic/involuntary response (to a stimulus); [2]</p> <p><b>(ii)</b> (controlled/coordinated by) spinal cord; [1]</p>	<p>A – consumers are heterotrophic</p> <p>A – producers are autotrophic</p> <p>A – burning R – breathing</p> <p>I – nutrition</p> <p>I – microorganisms/microbes/ saprophytes</p> <p>MP2 A – aircraft/industrialisation</p> <p>MP4 A – ref to slash and burn</p> <p>A – correct name for <b>D</b></p> <p>A – one contracts while the other relaxes</p>
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<p>(c) (i) adrenaline; [1]</p> <p>(ii) 1 increase in blood pressure;</p> <p>2 increase in heart rate/increased cardiac output/OWTTE;</p> <p>3 increase in breathing rate;</p> <p>4 glycogen converted to glucose/increase in blood glucose;</p> <p>5 more blood flow to (skeletal) muscles/less blood flow to skin/gut;</p> <p>6 pupils dilate;</p> <p>7 hairs raised;</p> <p>any three – 1 mark each [3]</p> <p style="text-align: right;"><b>[Total: 10]</b></p>	<p>beware – these are alternatives not separate marking points</p>
<p>9 (a) (i) Y – cytoplasm; Z – vacuole/cell sap; [2]</p> <p>(ii) extension/hair like structure increases surface area; [1]</p> <p>(iii) cell wall/cellulose; vacuole/Z; root hair/extension; any two – 1 mark each [2]</p> <p>(b) (i) 1 movement of water from a higher (water) concentration/water potential;</p> <p>2 to a lower concentration;</p> <p>3 through a partially permeable membrane; [3]</p> <p>(ii) 1 cell sap/contents of vacuole has lower water concentration/lower water potential;</p> <p>2 than water concentration of soil (water);</p> <p>3 cell membrane is partially permeable;</p> <p>any two – 1 mark each [2]</p> <p style="text-align: right;"><b>[Total: 10]</b></p>	<p>R – chloroplasts</p> <p>MP1 A – diffusion of water (molecules) = movement of water. A – movement of water from a dilute solution MP2 A – to a more concentrated solution A – movement of water down a concentration gradient = MP1 and MP2 A – semi-permeable MP1 A – cell sap/contents of vacuole is more concentrated solution</p> <p>MP2 A – than soil water</p>

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<p><b>10 (a) <u>Phloem</u></b>  1 transport of sugars/amino acids;  2 in solution/translocation;  3 from leaves to rest of plant/from supply to demand/  OWTTE;</p> <p><u>Xylem</u>  4 transport/movement of water;  5 transport/movement of minerals/ions;  6 from roots to leaves/rest of plant;  any four – 1 mark each [4]</p> <p><b>(b)</b> 1 veins have valves (and arteries do not);  2 to prevent backflow of blood;  3 arteries have more muscular walls/are more muscular;  4 to resist pressure;  5 arteries have a narrower lumen;  6 to maintain pressure;  7 arteries have more elastic tissue;  8 to generate/maintain pulse;  any two differences + explanation – 2 marks each [4]</p> <p style="text-align: right;"><b>[Total: 8]</b></p>	<p>A – sucrose/glucose</p> <p>A – named mineral/ion</p> <p>I – differences in composition, blood pressure and direction of blood flow</p> <p>A – thicker walls = more muscular walls</p> <p>only credit a maximum of 2 differences  Read whole paragraph and award marks consistent with candidate's best performance.</p>
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