This mark scheme is published as an aid to teachers and students, 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.

The grade thresholds for various grades are published in the report on the examination for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level syllabuses.

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

CIE is publishing the mark schemes for the October/November 2006 question papers for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level syllabuses and some Ordinary Level syllabuses.
Section A

1 (a) (micro)villi
   diffusion/or good description of
   thin wall/epithelium (R ref. cell wall)
   into lacteals/lymph (Ignore capillaries)
   lymph returned to blood
max 4

   (b) (i) lipase/steapsin
          1

   (ii) optimum/best AW + for enzyme/lipase action (I ref. body temp)
          1

   (c) fatty acids
       glycerol/glycerine/propantriol
       2

   (d) fatty acids/ref. smaller molecules
       (can) pass through membrane/Visking tubing
       concentration gradient/diffusion
       ref. acidity of or lowers pH of water/ref. acidity of molecules
max 3

Total = 11

2 (a) (i) transpiration (A evapotranspiration) (R evaporation)
        1

   (ii) 12.30
        1

   (b) (i) warmer AW
          faster + evaporation/vapouration (I refs. to transpiration)
          lighter/brighter
          stomata open
          ref. increased wind/decreased humidity
max 4

   (ii) water lost from plant cannot be replaced
          (A loses water faster than it gains water)
          overall decrease in water content of plant/loss of turgidity AW)
          (A refs. wilting)
          stomata/pores + close
max 2

   (c) * less evaporation of water/less loss of latent heat
       (R less transpiration)
       * to cool plant
       (* A reverse argument)
       2

Total = 10
3 (a) (i) coronary artery  2

(ii) P aorta (-tic arch)  
Q left + atrium/auricle  2

(b) (mark the first, one per line)  
2 from: thinner or weaker + walls/valves/pressure ref.  
(A less muscular + walls)  2

(c) (i) (mtf,opl)  
2 from: fat/cholesterol/blood cells/clot(ted blood)  2
(A atheroma for 1 mark) (A ref. fibres/fibrin)

(ii) natural response to damage or injury is for blood to clot AW  
platelets + release enzymes/cause fibrinogen to change to fibrin  
therefore drug prevents clotting (or implied – platelets cause blood to clot)  max 2

Total = 10

4 (a) (i) oxygen/temperature qualified (I air/temperature) (R warmth)  

(ii) cotyledon/seed leaves/endosperm  

(iii) testa (A seed coat) not accounted for  3

(b) (i)& (ii) mark together  
food digested/ref. enzyme action (I breakdown)  
starch → sucrose or glucose/protein → amino acids  
transportation AW  
to growing regions/used for growth (or process described)  
used for respiration/correct energy reference  max 4

(c) (i) & (ii) mark together  
(food storage region) will still lose mass  
more slowly AW  
plumule + photosynthesis AW  
large(r)/fast(er) increase in mass  
due to more/faster growth  max 4

Total = 11

5 (a) oviduct/Fallopian tube (mark the first) (A description of oviduct)  1

(b) mitosis (-totic)  1

(c) implantation AW  
in lining/endometrium (R wall)  
of uterus/womb  
differentiation AW/ref. placental devpt. (I fetal membranes)  max 2

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(d) mother’s gametes shown as $I^a$ and $I^o$  
father’s gametes shown as $I^b$ and $I^o$  
*grid correctly filled (A.e.c.f if gametes incorrectly shown) 
square $I^oI^o$ identified as the embryo  

(A genetic diagram, but *ensure gametes are not shown as parental genotypes – *this mark not available on a genetic diagram)  

Total = 8

Total for Section A = **50**
Section B

6 (a) (A any three facts linked to a process)
   osmosis is simple diffusion
   partially/selectively/semi-permeable membrane
   correct refs. in each case to:
   no energy/energy required
   water only/ions AW or larger molecules
   down/against concentration gradient max 3
   (R along)

(b) (i) salts ions or one named (A minerals) (R nutrients)
   from soil
   ref. root hairs
   to make proteins/amino acids/DNA
   chlorophyll (R chloroplasts)
   even when scarce in surrounding soil AW max 4 for (i)
   (could be ref. to concentration gradient)

(ii) glucose
    amino acids
    uptake from gut through (micro)villi
    *for protein (or named) manufacture (linked to amino acids)
    *for respiration/correct energy ref. (linked to glucose) max 7 for (b)
    (mark 1st.2)
    Or kidneys; reabsorption; 2 named salts or any 2 from glucose, amino
    acids, urea, salts (unspecified or one named);;
    ref. osmoregulation; any one of those marked * above; max 7 for (b)

Total = 10

7 (a) ref. hypothalamus
    nervous control/impulses/brain
    less active sweat glands/sweating stops
    (A inactive)
    less evaporation (of sweat) (R no evaporation)
    vasoconstriction AW
    of arteries/-erioles/blood vessels (R capillaries/veins)
    less blood
    to capillaries (A ref. heat loss from)
    less heat lost
    shivering generates heat/hair erection decreases heat loss (or insulates)/adrenaline
    release/higher metabolic rate
    one behavioural reference (e.g. moving/putting clothes on) max 7

(b) a change (in level/of set point) AW
    is responsible for/triggers/causes/ref. sensor/ref. receptor
    a response/reaction
    (which leads to) restoration of original level max 3
    (If given, accept specific examples instead of general account)

Total = 10

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8 E  (a) mosquito is a **human parasite**
(breeds in) large numbers
attracted to warm bodies
feeds on blood
sharp mouthparts/relatively painless bite
feeds at night/while victim sleeps
spits before sucking/ref. anticoagulant
t [vector of] carrier of/not seriously affected by/host to + human pathogen(s) (or named) AW
(R named disease)
carry many pathogens
(fly) from person to person

max 5

(b) intimate body contact or described
bacterium/a/spirochaete/Treponema
primary sore or described/papule/chancre
a secondary symptom described
(headache/slight pyrexia/rash/skin lesions/ulceration/hair loss)
(lengthy) dormant period
tertiary symptom described (organ destruction)
antibiotic or named (doxycycline, erythromycin, tetracycline)
(A 'penicillin' to mean antibiotic)
need for early diagnosis/treatment

max 5

Total = 10

8 O  (a) named plant or animal (with some economic importance)
(plausible for description given)
named selected feature
breeding of specimens both with desired feature
selection of offspring with best of desired feature
over a period of time/repetition
financial reward (i.e. of some pecuniary benefit)
danger of inbreeding/disadvantage to organism involved
(e.g. highly-strung dogs/Pekingeses with breathing problems)

max 6

(b) named organism + required characteristic
(i.e. what you are breeding for)
required characteristic ensured/no variation
no dangers of inbreeding/of introduction of undesirable traits
*cheap/large numbers of offspring/one parent needed
*relatively quick
*genetically identical
Any of the marks indicated with * available for a fungus or a seaweed
Up to a max 2

Total = 10