UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Ordinary Level

MARK SCHEME for the October/November 2006 question paper

5090 BIOLOGY

9050/02 Paper 2, maximum raw mark 80

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.

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UNIVERSITY of CAMBRIDGE
International Examinations

Section A

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

(b) **(i)** lipase/steapsin — 1

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

(c) <u>fatty acids</u>
glycerol/glycerine/propantriol — 2

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

Total = 11

2 **(a)** **(i)** <u>transpiration</u> (A evapotranspiration) (R evaporation) — 1

(ii) <u>12.30</u> — 1

(b) **(i)** warmer AW
faster + evaporation/vapouration (I refs. to transpiration)
lighter/brighter
<u>stomata</u> 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 <u>latent</u> 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) (A platelets)
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
radicle slightly faster increase in mass (than when in dark)
due to more/faster growth max 4

Total = 11

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

(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

(d) mother's gametes# shown as I^A and I^o } max 1 if wrong
father's gametes# shown as I^B and I^o } symbols used
*grid correctly filled (A e.c.f. if gametes incorrectly shown)
square I^oI^o identified as the embryo 4
(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

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
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/repitition
financial reward (i.e. of some pecuniary benefit)
danger of inbreeding/disadvantage to organism involved — max 6
(e.g. highly-strung dogs/Pekingeses with breathing problems)

(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 — max 4
Any of the marks indicated with * available for a fungus or a seaweed
Up to a max 2

Total = 10