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GCE O Level Biology (7040)

June 2005

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BIOLOGY 7040, MARK SCHEME

Symbols used in mark points

; indicates separate mark points
/ indicates alternatives
eq means allow any correct equivalent

Paper 1

1. (a) (crop) not killed / harmed / affected;
(only) weeds killed; (Ignore pests)
increased yield / less competition; **(2 max)**

(b) kills / destroys pests / insects;
less pesticides / insecticides used / applied / bought;
less pesticides released into environment / pollution / harm to environment;
does not kill / harm /affect / other animals / specific; **(3 max)**

(c) (i) herbicide;
plastic; **2**

(ii) decomposition / decay / break down;
carbon dioxide and water;
by bacteria / fungi / saprophytes; **(2 max)**

(d) gene / DNA;
restriction;
plasmid;
vector;
ligase; **(3 max)**

(e) A vision / prevent night blindness / correct ref. to epithelial tissue;
Fe haemoglobin / red blood cells / prevent anaemia; **2**

Total 14 marks

2. (a) 51.67 / 51.7;
30.86 / 30.9;
cm^3 / kg; **3**

(b) (i) 55 / 1550 x 100;
3.55 / 3.5; **2**

(ii) less oxygen / air;
less buoyant / cannot float / more dense; **2**

(c) uses oxygen;
produces carbon dioxide;
produces water;
produces more energy / ATP / complete breakdown;
(ignore ref to cytoplasm / mitochondria)
does not produce lactic acid; **(2 max)**

(d) more oxygen in blood / tissues;
enables aerobic respiration / more energy released /
swim longer;
less lactic acid / oxygen debt;
less effort to stay submerged / has flippers /
streamlined/ eq;

uses anaerobic respiration;
(greater) tolerance of lactic acid; **(2 max)**

Total 11 marks

3. (a) (i) asexual /vegetative propagation / cloning / budding /
binary fision; **1**

(ii) growth / eq;
repair / eq; **2**

(b) genetically identical / same alleles;
same number of chromosomes as parent cell / (diploid);
2 daughter cells produced; **2**

(c) (i) testis;
ovary; **2**

(ii) anther;
pollen;

ovary / carpel;
ovule; R ovum / egg **4**

(d) FSH;
from pituitary; (once)
stimulates follicle development;

oestrogen;
inhibits FSH;
repairs / thickens / eq uterus lining /wall;

LH; (from pituitary)
ovulation / eq;
develops corpus luteum;

progesterone;
inhibits LH;
maintains uterus lining wall; **(9 max)**

(e) C two / range of temperatures;
O same species of seed / species stated;
R repeat / more than one seed;
M % germination / count out of;
S1 leave for 1 day +;
S2 same water / oxygen / light / soil / eq; **(5 max)**

Total 25 marks

4. (a) (i) cell wall;
cytoplasm;
vacuole;
nucleus;
cell membrane;
shape; **(5 max)**

(ii) osmosis;
high conc. of water to low conc /eq;
selectively permeable membrane; **3**

(iii)
use of energy / ATP;
active uptake;
low concentration to high concentration; **(3 max)**

(iv) xylem; **1**

(b) photosynthesis;
support / turgid/ eq;
(medium for) chemical reactions / activate enzymes;
transport medium / solvent;
cooling; **(3 max)**

(c) evaporation;
from lakes/rivers/oceans;
(from) sweat;
(from) respiration;
breathed out;
transpiration;
plants / leaves / stomata; **(4 max)**

(d) C + and - water / range of watering;
O same plant / species / size at start / eq.;
R repeat / several plants / pots;
M measure mass / height;
S1 leave for 1 day to 3 months;
S2 control light / temp. / eq;
res less growth in overwatered;
ex no oxygen for respiration / active uptake / energy; **(6 max)**

Total 25 marks

5. (a) LHS: RHS; Balanced; **3**

(b) uses light ;
to chemical energy / carbohydrate/ named carbohydrate;
used for energy / respiration;
used for growth / cellulose / cell walls; **(3 max)**

(c) chloroplasts / chlorophyll + trap light;

chloroplasts / chlorophyll + more in upper layers / palisade cells;

waxy cuticle + reduce water loss / transpiration;

stomata + carbon dioxide entry;

air spaces in spongy layer / mesophyll + gas exchange/ movement;

thin + diffusion / light penetration;

large surface area + diffusion / light absorption;

xylem;
water/mineral transport to leaf;
phloem;
sucrose / sugar transport from leaf; (ignore glucose) **(10 max)**

(d) temperature;
carbon dioxide;
water; (ignore humidity)
minerals; **(3 max)**

(e)
C + and - light / range of light intensities;
O use water plant; (allow from diagram)
R repeat;
M1 method used collects/ counts bubbles ;
M2 measurement of rate;
S1 two of control temperature / CO_2 / size of plant (stated);; **6**
S2

Total 25 marks

6. (a) (i) both organisms benefit;
how each benefits;
example of both organisms; **3**

(ii) one organism feeds on another;
one is harmed;
example of parasite; **3**

(iii) organism uses dead / decaying organism / organic matter;
enzymes secreted externally / extracellular digestion;
example of saprophyte; **3**

(b) (i) eg cholera;
water borne; **2**

(ii) eg flu;
droplet infection / through air; **2**

(c) C two temperatures / range of temperature;
O same mass / volume / conc. of fungus / same species (stated);
R repeat;
M measure increase in mass / area / number;
S1 leave for stated time 1 hour +;
S2 control oxygen / water / substrate / eq; **(6)**

(d) (i) compound eyes;
wings;
head, thorax and abdomen / 3 body parts; (ignore 3 segments)
pair of antennae;
six jointed legs; **(3 max)**

(ii) change of form (stated);
example of life cycle;
allows larvae and adult to live in different habitats / eat different foods;
avoids competition;
larvae adapted for feeding / adult for reproduction; **(3 max)**

Total 25 marks

7.

(a) (i) growing crops; **2**
keeping / feeding animals / grazing;

(ii) loss of habitat;
food chain disruption / loss of species;

less photosynthesis / less carbon dioxide absorbed / more carbon dioxide in air;
global warming / eq;

less evaporation / transpiration;
less rain;

leaching / minerals washed out / loss of topsoil / erosion;
reduction of plant growth / eutrophication;

less leaf fall;
less minerals / less recycling; **(6 max)**

(b) (i)
C + or - fertiliser / range of fertiliser concentrations;
O same age / species / size (seeds);
R several plants per treatment;
M measurement of growth eg mass / length;
S1 leave for stated time 3 days+;
S2 same soil / water / temperature /light intensity; **6**

(ii) not all used / wasted fertiliser;
pollution of water;
osmotic damage; **3**

(c) protein rich food;
regulated feeding / small amounts / fed frequently;
water high in oxygen;
waste removed / water cleaned / replaced / filtered;
protection from predators;
protection from disease;
separation of fish sizes / ages;
selective breeding; **8**

Total 25 marks

Paper 2

1. (a) A vena cava;
B aorta;
C pulmonary artery;
D pulmonary vein; **4**

(b) (i) atrioventricular valve / tricuspid; **1**

(ii) allows blood to flow from atrium to ventricle / one direction;
prevent blood flowing back;
shut / close;
increase in pressure / contraction (shuts valve); **3**

(c) thicker / more muscular; **1**

(d) more oxygen / oxygenated; (Ignore ref to colour)
less carbon dioxide;
high pressure; **2**

Total 11 marks

2. (a) different <u>alleles</u> ;
dominant + recessive / Aa; **2**

(b) (i) codominance; **1**

(ii) C^R C^R ; C^W C^W ; **2**

(iii) C^R C^W ; **2**

(iv) $C^R C^W$; **1**

(c) $C^R C^W$ x $C^R C^W$;

C^R or C^W C^R or C^W ;

$C^R C^R$ $C^R C^W$ $C^R C^W$ $C^W C^W$;

Red roan roan white ;
(ratio must be linked to phenotypes) **4**

Total 12 marks

3. (a) protein / amino acids; **1**

(b) ammonia to nitrite / nitrate (III);
by nitrifying bacteria / *Nitrosomonas;*
nitrite / nitrate (III) to nitrate / nitrate (V);
by nitrifying bacteria / *Nitrobacter;* **3**

(c) (i) nitrogen; **1**

(ii) denitrifying ; **1**

(d) line Z;
(more) ammonia means (more) nitrate/limited number of bacteria/eq; **2**

Total 8 marks

4. (a)

Endocrine gland	Hormone	Target	Effect
pancreas / islets of Langerhans ;	(insulin)	liver/muscle ;	convert glucose to glycogen / lower blood glucose;
(adrenal)	adrenalin(e) ;	(muscle)	(convert glycogen to glucose)

4

(b)

type of molecule	tick
monosaccharide	
disaccharide	
polysaccharide	✓

1

(c) (i) eat / food / drink;
frightened / nervous / adrenaline release;
glucagon release / glycogen to glucose; **(2 max)**

(ii) respiration / exercise;
insulin release / glucose to glycogen / eq; **2**

Total 9 marks

5 (a) S - scale of at least one axis greater than 50%;
L - straight lines + through points;
lines labelled;
A - axes correct + labelled;
P - points plotted (deduct one per wrong plot up to maximum 2);; **6**

(b) (i) 2000 - 1500 or 500;
/ 2000 x 100; **2**

(ii) 10/100 or /100 x 2000;
200g; **2**

(c) (bag A) bigger mesh size / eq;
bigger / more organisms can enter; **2**

(d) type of leaf;
surface area / number of leaves; (ignore mass)
temperature;
moisture ;
pH ;
buried at same depth;
same size bag; **(2 max)**

Total 14 marks

6. (a) renal artery;
renal vein;
ureter; **3**

(b) water;
salts;
urea; **3**

(c) biuret / NaOH + $CuSO_4$;
(blue to) purple; **2**

Total 8 marks

7. (a) Transpiration; **1**

(b) (i)

Condition	Change
	increases;
	increases;
	reduces;

3

(ii) water blown away ;
increases diffusion gradient / drier / less saturated ;
increase diffusion ; **3**

(c) decreases water loss;
trap air / water vapour / keeps layer of unstirred air ;
decreases diffusion; **3**

Total 10 marks

8. (a) temperature falls in all;
large falls least / small falls most;
mention of all three beakers; **3**

(b) SA / Vol ratio;
smallest breaker has largest SA / Vol ratio; **2**

(c) temperature does not fall so much / water stays warmer;
reduce heat loss / stops heat escaping;
act as insulator / traps air / heat; **3**

Total 8 marks

9. (a) Auxin / IAA; (allow any PGS) **1**

(b) (i) auxin stimulate growth / cell elongation;
auxin side grows (faster); **2**

(ii) towards light / positive;
phototropism;
auxin moves away from light;
side away / dark side has auxin;
side away / dark side grows faster; **(4 max)**

Total 7 marks

10. (a) A large intestine colon;
B liver;
C stomach; **3**

(b) Amylase / lipase / protease / trypsin;
Starch / lipid / fat / proteins;
Maltose / fatty acid / glycerol peptides / amino acids; **3**

(c) peristalsis;
contraction ;
muscles; **(2 max)**

(d) digestion / break down / produces enzymes / peptidase / maltase;
absorption; **2**

(e) emulsifies fat / produces smaller droplets / eq;
increase surface area ;
neutralises stomach acid / makes alkaline;
provides optimum pH **for enzyme action / digestion;** **(3 max)**

Total 13 marks

BIOLOGY 7040, CHIEF EXAMINER'S REPORT

General Comments

The examiners were once again impressed by the knowledge and understanding shown by the candidates on both of the papers. The candidates were able to describe and explain biological processes and apply their knowledge and understanding to a wide range of biological scenarios. We were pleased to note the continuing improvement in candidates' scores on those items involving experimental design.

Paper 1

Most candidates were able to answer the questions in the time allowed and only a very few candidates seemed to run out of time. A few candidates failed to follow the rubric and attempted to answer more than 3 questions from section B. These candidates penalise themselves by wasting time on questions which will not yield them any marks. We ask centres to remind candidates to follow the rubric and therefore maximise their chances of attaining a higher grade. Candidates can afford to spend up to 10 minutes or so deciding which of the section B questions they could obtain most marks on.

Question 1

This question asked candidates about a printed passage on herbicides, pesticides and some applications of genetically modified plants. Candidates generally performed quite well on this item with several gaining full marks.

In part (a) only the best candidates recognised the fact that the herbicide resistant plants would not be killed by the herbicides. The farmer could thus use the herbicides to control the weed population without harming his crop. The best candidates were also able to describe how killing the weeds would reduce competition and so increase crop yield.

Most candidates gained credit in part (b) for describing that less pesticide would need to be used and that the GM plants could kill insects by releasing their own pesticide. Many candidates also noted that the plants' pesticide release would be specific and not contribute to environmental pollution.

In part (c) most candidates were able to name two substances given in the passage that are biodegradable. The better candidates could also explain that a biodegradable substance is decomposed by bacteria or fungi to carbon dioxide and water. No credit was given to statements such as 'the substance disappears'.

In part (d) responses were variable depending upon centre. Some candidates are well prepared for questions on genetic engineering and able to write confidently using appropriate terminology; in other centres candidates either do not learn the material or have not covered this section of the syllabus. All the examiners expected was a description of how the required gene is extracted using restriction enzyme inserted into a bacterial plasmid using ligase enzyme.

In part (e) most candidates were able to remember the role of vitamin A in preventing night blindness and the role of iron in haemoglobin formation.

Question 2
Candidates were provided with data on oxygen content in different body parts of a diving seal and a human.

In part (a) most candidates were able to calculate correctly the total amount of oxygen per kg in the seal and in the human. Some candidates failed to earn full credit for their calculations because they did not include the appropriate units. Centres should also ensure that their students are able to give an answer correctly to 1 or 2 decimal places as some lost credit by rounding errors.

In part (b)(i) many candidates were able to calculate correctly the percentage. In part (ii), while many answers stated that seals have less oxygen present in their lungs only the best included reference to reduced buoyancy.

For part (c) most candidates gained full marks for giving two differences between aerobic and anaerobic respiration. Some failed to earn full credit by describing anaerobic respiration as producing ethanol or carbon dioxide, neither relevant to a question on mammalian physiology.

In part (d) only the very best candidates earned full marks stating that a seal has a higher oxygen concentration in its blood and tissues and this enables aerobic respiration to continue.

Question 3
This was quite a popular question, being answered by many of the candidates.

In part (a) most candidates were able to name a method of reproduction such as asexual or vegetative propagation. Some candidates confused growth and repair and gave two examples of cell replacement.

In part (b) many correct answers described the maintenance of chromosome number associated with mitosis and the production of genetically identical cells.

Candidates were able to give in part (c)(i) the organs in a mammal in which meiosis takes place. They performed less well in (ii) giving the structures and cells from a flowering plant.

In part (d) the candidates who chose this question generally showed a high level of knowledge of the menstrual cycle and its hormonal control with many gaining full credit.

For the experimental design those candidates that had carried out, discussed with teachers or considered such an experiment performed very well. It was again encouraging to see the use of the CORMS prompt described in previous reports and its use often led to high marks for this part. The weakest candidates described the experiment that demonstrates production of heat during germination.

Question 4
This was quite popular, chosen by about 60% of the candidates.

Part (a)(i) was well answered by those candidates who had seen a root hair cell. Those who drew a generalised plant cell could still gain some credit. Most candidates are able to describe osmosis and correctly explain the movement of water from a dilute solution (with a high water potential) to a more concentrated solution (with a lower water potential) through a partially permeable membrane. In part (iii) some candidates believe that mineral ions diffuse into a plant, this is usually not the case

and we expected a description of active uptake, against a concentration gradient in a process that requires energy.

In part (b) most could give three reasons why water is important to plants.

Part (c) required candidates to describe how water gets into the air and many gained full credit.

For the experimental design question in part (d) the candidates who used the CORMS prompt were often able to score all of the following marks. C using a plant supplied with normal amount of water and a saturated plant. O using the same species and size of plant. R repeating the experiment. M measuring the growth by recording height / mass before and after the procedure. S allowing the experiment to run for 3 days +. S controlling the temperature / light intensity in which the plants grow. For the results, candidates needed to describe how the saturated plant would grow less well and explain this by reference to lack of oxygen for respiration and therefore growth.

Question 5
This was the most popular question being chosen by 85% of candidates.

In part (a) most candidates were able to write a balanced equation for photosynthesis. Only a few candidates gave the equation for respiration.

The better responses in part (b) described how plants absorb light energy and convert it to chemical energy in the form of carbohydrate which they use. The best responses described how glucose can be converted to starch or cellulose or used in respiration.

For part (c) we expected an account explaining how a leaf is adapted for photosynthesis. Some students merely described the structure without linking this to function; these answers did not earn full credit. So, for example, a statement 'that the leaf cells contain chloroplasts' should be linked to a function such as 'to absorb light energy'. Many candidates were able to do this and thus earned full marks.

Candidates who knew what an abiotic factor was, were able to gain full credit in part (d)(i).

In the experiment design question part (d)(ii) many candidates, especially those that used the CORMS prompt, scored full marks.

Question 6
This was quite a popular question with some centres but unpopular with others. It was answered by 67% of candidates.

Many centres had taught feeding relationships well and candidates from these earned full credit on part (a).

Part (b) produced variable responses from candidates with some having no idea whether a disease was caused by a virus or a bacterium.

In part (c) candidates who followed the CORMS prompt often earned high marks especially if they identified the fungus and supplied it with a suitable substrate, such as mucor on bread or yeast on glucose solution.

Most also scored well on part (d)(i) but very few gained full credit on part (ii). We expected a description of metamorphosis as being a change of form, an example of an insect life cycle and an explanation of the different adaptations of the larvae and the adult.

Question 7

This was the least popular question, chosen by 26% of candidates.

In part (a)(i) some students repeated the question stating that the land could be used for agriculture. This earned no credit. What was expected was simply, 'for grazing animals and for growing crops'. Some of the better candidates gained full marks for describing the effects of deforestation but others had not studied this section or failed to remember what they had learnt.

In part (b)(i), as elsewhere in the paper some candidates applied the CORMS prompt and scored very well. We would expect candidates to apply a reasonable time frame to their experiments such as at least 3 days for any effect of fertiliser to be noticeable (although 3 weeks would be preferred). In part (b)(ii) marks were available for stating that not all of the fertiliser would be absorbed, that excess would pollute water and by explaining the osmotic effects of excess soil minerals on the plant.

Part (c) produced very disappointing responses from most candidates. As shown in the mark scheme we expected simple statements describing the following: provision of protein rich fish food; regulated feeding; aeration of the pond to maintain oxygenation; removal of waste products from fish ponds; netting of ponds to prevent predation; use of antibiotics/ drugs to prevent disease; separation of fish of different ages/sizes; use of selective breeding.

Paper 2

Question 1

The vena cava was identified by most candidates but thereafter only the better students were able to identify the other blood vessels correctly. The atrio ventricular valve was more often recalled as the tricuspid valve, and both terms were credited. The function of the valve to prevent backflow was well known, but only the better candidates explained that the valve closes as a result of the contraction of the ventricle and the subsequent build up in pressure. Most recalled that the left ventricle has a thicker muscular wall than the right ventricle, and most recalled that the blood in the left ventricle contains more oxygen and less carbon dioxide than the blood in the right ventricle.

Question 2

Many struggled to define the term heterozygous. Answers that made it clear that different alleles were present, and that one was dominant whilst the other was recessive, were credited. Many students stated that different genes were involved and lost marks as a result. The term codominance is unfamiliar to many candidates. In part (b) (iii), a common error was to use only one allele to depict the genotype of the red bull and the white cow, despite being told what the alleles for hair colour were. However, many candidates progressed to give the correct genotype for the appropriate gametes. Many gave both alleles for the gametes and marks were credited providing it was clear that the gametes were separated from each other and did not appear as a homozygous genotype. Separation could be by a space, a comma or by encircling. Many candidates were able to construct an acceptable genetic diagram. If the original parent genotype was incorrect, three marks were still available for correct gamete genotype and the resulting offspring genotypes and phenotypes.

Question 3

The nitrogen cycle is always a challenge and this question showed that students are confused about the bacteria involved and the changes they make. Candidates are not expected to recall the generic names of the bacteria, but they are expected to be able to recall the terms nitrifying and denitrifying as demanded in this question. Protein or amino acids were the food molecules anticipated in part (a), and in part (b) candidates were expected to recall that nitrifying bacteria are involved in a two step process: ammonia to nitrite and nitrite to nitrate. Credit was not given for stating ammonia to nitrate as this phrase was in the stem of the question. Denitrifying bacteria are responsible for converting nitrate to nitrogen gas, but many candidates wrongly believed that nitrogen fixing bacteria have a part to play. Some mentioned nitrifying bacteria in this role. Interpretation of the graph challenged many, though the better candidates chose Z and explained that an increase in ammonia would produce a consequent increase in nitrate. Candidates did not mention the part played by limiting factors, though they would have gained credit had they done so.

Question 4

Prompted by the information in the table, most candidates recalled that adrenalin is the hormone secreted by the adrenal gland. However, recall about insulin was more variable. Most recalled that the pancreas, or even the Islets of Langerhans, secreted insulin, but only the more able candidates recalled the target as the liver or muscle cells and that the effect is to lower blood glucose levels by converting glucose to glycogen. Candidates need to be reminded about the importance of spelling biological terms correctly. Glycogen is often confused with glucagon and examiners are often confronted with a hybrid word which is not credited. About a third of the candidates knew that glycogen is a polysaccharide. Part (c) discriminated between candidates. The more able appreciated that an increase in blood glucose could result from eating a meal, releasing adrenaline as a result of anxiety or releasing glucagon which would convert glycogen to glucose. A decrease in blood glucose might be expected as a result of respiration linked to exercise or by insulin release that would convert glucose to glycogen. Weaker candidates had their knowledge and understanding exposed by this question: their answers were often confused and jumbled.

Question 5

The graph plotting was the best seen for some time. The most common errors were putting the axes the wrong way round and forgetting to label the lines bag A and bag B. Some excellent graphs were produced with straight lines joining accurately plotted points and with axes correct and labelled. The calculations challenged many candidates. In (b) (i), credit was given for subtracting 1500 from 2000, dividing by 2000 and then multiplying by 100. Candidates who expressed these ideas in words were fully credited. In (b) (ii), credit was given for dividing 10 by 100 and then multiplying by 2000. Candidates who obtained the correct answer of 200 were fully credited despite the method by which they arrived at this number. Most appreciated that bag A had larger holes, but only the better candidates linked this observation to the increased access offered to decomposers, particularly the bigger ones such as earthworms. Many were able to offer acceptable answers in (d) demonstrating sound understanding of experimental design. However, a surprising number merely reiterated the design of the investigation making reference to the bags needing different sized holes, the same mass of leaves and being left for the same time. These responses were not credited.

Question 6

Most recognised the renal artery and the renal vein. Most also recognised tube Z as the ureter, though some lost credit because their spelling was deemed to be too close to the word urethra. Candidates who named the three major constituents as water, urea and mineral ions gained full marks. Minor constituents were not credited. A pleasing number of candidates are aware of the biuret test for protein and the resulting purple colour of a positive result.

Question 7

Most candidates struggled with the latter part of this question. Many recalled transpiration correctly and appreciated the effect on water loss with changing environmental conditions. However, many wrongly thought that a reduction in humidity would decrease the water loss. Part (b) (ii) was challenging, with only the very best appreciating that wind removes water molecules from the surface of a leaf, thereby increasing the concentration gradient which would lead to an increase in diffusion out of the leaf. Similarly, in part (b) (ii), only the very best candidates appreciated that the hairs would reduce water loss because they would trap water vapour, decrease the concentration gradient and therefore decrease the rate of diffusion.

Question 8
Credit was given for stating that the temperature fell in the large, medium and small beaker, and pointing out that the temperature in the small beaker fell the most or the converse for the large beaker. While many candidates gained full marks, the examiners noted that their ability to answer a straightforward description question in an erudite, precise and accurate style left much to be desired. Part (b) required a correct reference to the concept of surface area to volume ratio, a difficult concept only fully appreciated by the most able. In (c), three ideas were credited: firstly, the temperature not falling as much; secondly, the insulating property of fur, and thirdly, prevention of heat loss.

Question 9
The vast majority of candidates recalled auxin as a plant growth substance, but only the more able candidates were able to explain what auxin does. As such, answers that stated the role of auxin in growth by cell elongation were acceptable in preference to those that merely commented that auxin helps shoots to bend. The concentrating effect of light on auxin that ensures the shaded part of a shoot has more, and this is why there is more cell elongation producing the response of positive phototropism, was expressed very well by the more able candidates. Weaker candidates simply discussed the bending towards light and the importance of this response to photosynthesis.

Question 10
This question helped many candidates finish the paper on a high note. Recognition of the parts of the digestive system posed little difficulty, and the enzymes, substrates and products related to pancreatic juice were also recalled with apparent ease. A common error was to believe insulin was an enzyme that acted on glucose to produce glycogen. The role of muscle contraction during peristalsis to move food through the ileum was well known as was the function of the ileum in absorption and further digestion. The role of bile remains a problem for many candidates who believe that it digests fat into glycerol and fatty acids - a perennial misconception. There were many excellent answers referring to its role in emulsifying fat to increase the surface area, and its role in neutralising acid from the stomach to produce the optimum pH for enzymes.

BIOLOGY 7040, GRADE BOUNDARIES

Grade	A	B	C	D	E
Lowest mark for award of grade	139	118	97	87	61

Note: Grade boundaries may vary from year to year and from subject to subject, depending on the demands of the question paper.

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