UNIVERSITY OF MALTA

SECONDARY EDUCATION CERTIFICATE
SEC

BIOLOGY

May 2011

MARKING SCHEME

MATRICULATION AND SECONDARY EDUCATION CERTIFICATE EXAMINATIONS BOARD
Paper I

1a
i DNA 1 mark
ii conservation 1 mark
iii species 1 mark

b.
i The litter decomposes nutrients are released in soil/higher humus content in soil/leaf litter provides habitat for small invertebrates/as a food source for detritivores or earthworms; serves as compost/prevents soil erosion/keeps soil damp. Any TWO or equivalent Award 0.5 marks for: provides shelter for insects Do NOT accept: shelter from rain/improves aeration/provides stable home for organisms. 2 marks

ii Spiders and centipedes are not insects. Spiders are arthropods belonging to class of arachnids and centipedes are arthropods belonging to class of myriapods. 2 marks

c.
i Four genera 1 mark

ii *Elephantus fuscus* and *Elephantus rozeti* 2 marks
Award 2 marks ONLY if both names are listed correctly. Award only 1 mark if names are not underlined.

Total: 10 marks

2a.
i 5 1 mark

ii 4 1 mark

iii 3 1 mark

iv 2 1 mark

b. E and F 2 marks
Do NOT award any mark if more letters are listed.

c.
i nitrogen-fixing bacteria 1 mark

ii denitrifying bacteria 1 mark

d. The bacteria lash the flagellum from side to side, propelling the body along. (Accept for movement) 1 mark
Award 0.5 mark if students mention *bacterium swims*.

Total: 9 marks

3a. The balloon on the tube with the boiled yeast suspension did not inflate while the balloon on the yeast suspension inflated. 1 mark
Award 0.5 marks if students mention balloon gets bigger or expands/enlarges
In tube A no carbon dioxide is produced because yeast had been killed so no anaerobic respiration/fermentation takes place. Award 0.5 marks if only respiration is mentioned. Award 0.5 marks if only a gas is mentioned. Do NOT accept yeast was denatured.

b. Water moved out of cell from a high to low water concentration/water moved to a lower water concentration outside the cell/water moved from a higher water concentration inside the cell.

<table>
<thead>
<tr>
<th></th>
<th>Only photosynthesis</th>
<th>Only respiratiuon</th>
<th>Both</th>
<th>Neither</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td>✓</td>
<td></td>
</tr>
</tbody>
</table>

(1 mark each correct row– 4 marks)

Total: 9 marks

4a.

i. Rickets (accept: osteoporosis) 1 mark

ii. Calcium /phosphorus 1 mark

b. 22 pairs or 44 1 mark

c. Sex chromosomes 1 mark

d. i. Paul: Dd 1 mark

ii. Sue: dd 1 mark

e. Parents

<table>
<thead>
<tr>
<th></th>
<th>IAN</th>
<th>ELAINE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gametes</td>
<td>Dd</td>
<td>dd</td>
</tr>
<tr>
<td>F1</td>
<td>Dd</td>
<td>Dd</td>
</tr>
</tbody>
</table>

50% chance of having unaffected child. 1 mark

Do NOT award any marks if genetic diagram is worked out in a sex-linked manner or using other symbols than the ones indicated.

Total: 10 marks

5a.

i. xylem: E and K 2 marks
ii epidermis  A and H  

b. C and J  

c. Phloem  

Award only 0.5 marks if incorrectly spelt but phonetically correct.  
d. Decreased growth rate; mottled leaves; yellowing of leaves; discolouration; stunted growth; curled leaves; browning leaves; wilting; low yields; leaves dry out; leaf fall; death  

Do NOT accept pale leaves/faded leaves/bending of stem.  

Total: 9 marks

6a.  
i  

ii  

iii  

b. Y is the tissue fluid  

small molecules/blood plasma is squeezed out of the capillaries.  

c. Z  

d.  
i  

ii The capillaries are highly branched to cover an enormous surface area giving more space for diffusion to take place.  

iii Capillaries are only one cell thick so that substances have short distances to diffuse through  

Total: 9 marks

7a. Compost is composed of organic materials derived from plant and animal matter that has been decomposed largely through aerobic decomposition. Compost is rich in nutrients and it is used in gardens/agriculture.  

b. Some farmers avoid using pesticides/chemicals to kill the pests in their fields. Instead they use natural predators of the pests – this is a natural pest control method to reduce the numbers of pests. This natural pest method is cheaper and more effective.  

c. Growing a single crop year after year in the same field depletes the soil nutrients of a field/furthermore related crops are prone to the same soil-living pests/diseases. Crop rotation is an effective agricultural practice to avoid depletion of soil minerals/to prevent soil borne pests/diseases/ to keep weeds or pests under control.  

Total: 9 marks
8a. Seeds (wheat grains) → seed-eating bird → peregrine falcon 1 mark
Do NOT award mark if direction of arrows is incorrect.

b. Dieldrin is a non-biodegradable pesticide that builds up in concentration 1 mark
along the food chain as each organism eats a larger number of the previous organism
in the chain. 1 mark
c. Dieldrin has been stopped therefore its effects were gradually fading out. 1 mark
Do NOT accept Dieldrin was used less/decreased.

d. 1050 – 350 =700  \[\frac{700}{1050} \times 100\% = 66\%\] 1 mark
e. This leads to a significant decrease in reproduction/reproductive success because eggs
often break during incubation. As a result there is a reduction in number of future breeding pairs. 2 marks
f. i. Nematodes have their bodies long and thread-like 1 mark
round in cross section. 1 mark
Accept cylindrical. 1 mark
Do NOT accept round only.

ii. Endoparasites live inside a host organism while ectoparasite live on the surface of the host. 2 marks

Total: 11 marks

9a. A = cilia 1 mark
Do NOT accept hairs.

b. Amount of mucus (phlegm) increases 1 mark
causing smoker’s cough/difficulty in breathing/leading to bronchitis. 1 mark

c. Medulla oblongata 1 mark

d. Single celled organisms such as the Amoeba are very small and thus have a large
surface area to volume ratio. Consequently they can exchange gases with their
surroundings through the cell membrane and so need no special gas exchange organs. 2 marks


e. i. Carbon dioxide 1 mark
ii. Nitrogen 1 mark

f. The volume of the thorax increases during inspiration while it decreases in expiration. 2 marks

Total: 10 marks

10a. Long and narrow leaves with parallel veins (accept leaves rarely serrated or lobed) 1 mark
Do NOT accept thin leaves.

b. A = Gymnosperms 1 mark
B = Pteridophytes 1 mark

c. i. Mosses OR Liverworts 1 mark
ii. Bryophytes are non vascular plants because they lack the vascular tissue phloem
and xylem/has no vascular bundles/veins.
iii By means of spores

d. Pollination and fertilisation

e.

4 marks for any four correct labels/1 marks neat diagram - 5 marks

Total: 14 marks
Paper IIA

1a. The rock pool is filled with water in the rainy season/wet season the rock pool is dry/decreases during summer/dry season. Award 0.5 mark if students mention rock pool filled during hydroperiod.

b. A **community** of plants: involves plants of **different species** growing in the same habitat. Do not award any marks if students only mention different types/kinds/groups of species.

A **population** of plants: involves plants of the **same species** growing in the same habitat. Do not award any marks if students only mention different types/kinds/groups of species.

c. It is important in order to complete the lifecycle before the pool dries out. Award 2 marks if students mention that lifecycle is completed before pool dries out so that seeds are formed.

d. Sunlight drives the process of photosynthesis. The greater the amount of sunlight available the higher the rate of photosynthesis leading to more/enhanced **plant growth**.

e. Leaves above water need a waxy cuticle to decrease water loss. This problem is not present in leaves below water level. 2 marks

f.

i Number of individual plants in the pool decreases; leading to a reduced ability to compete. Do NOT accept extinction of plants in rock pool.

ii Plants can colonise new areas/rock-pools/spreading of species to occupy new habitats. Accept reduces intraspecific competition. Award 0.5 mark if only competition is mentioned.

Total: 13 marks

2a 6 marks
Correct drawing of line graphs: including title (1), labelling of axis (1), correct scale (1) correct plotting (2), key (1). DO NOT AWARD ANY MARK IF GRAPH PAPER IS NOT USED.

DO NOT AWARD ANY MARK IF INVERTED AXIS ARE USED.

DO NOT AWARD ANY MARK IF HISTOGRAMS AND SEPARATE GRAPHS ARE USED.

b.

i The birth rate overall increases from 1975 to 1990 but decreases rapidly from 1990 to 2005/6. 1 mark

ii The death rate remains relatively **constant** from 1975 to 1990 but then decreases from 1990 to 2005/6. 1 mark

c. Decrease in birth rate due to increased birth control methods/smaller family units. Any ONE or equivalent 1 mark
Award 0.5 mark if students mention it increases and decreases.
Decrease in death rate due to adopted healthier lifestyles; advance in science and medicine; increased awareness about health hazards.
Any ONE or equivalent 1 mark

d.  
1975 – 2006  
11.9 – 10.1 = 1.8  1 mark  
1.8/11.9 × 100 = 15.1%  1 mark

Total: 12 mark

Section B

3a.  

<table>
<thead>
<tr>
<th>Nervous system</th>
<th>Endocrine/hormonal system</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fast</td>
<td>Slow</td>
</tr>
<tr>
<td>Short lasting effect</td>
<td>Long lasting effect</td>
</tr>
<tr>
<td>Specific parts of the body affected</td>
<td>Widespread effect on body</td>
</tr>
<tr>
<td>Nerve impulses carry information</td>
<td>Hormones /chemical messengers carry information</td>
</tr>
<tr>
<td>Brain, spinal cord, nerves</td>
<td>Endocrine glands</td>
</tr>
</tbody>
</table>

Any two differences  1 mark for each difference – 2 marks

b.  
i A reflex action is an automatic/immediate/rapid/involuntary/stereotyped response of the body to a stimulus.  2 marks  
Do not award any mark if students mention a reflex action is a response to a stimulus.

ii Receptor in skin receives stimulus.
Sensory neurone carries impulse from receptor to spinal cord.
Intermediate nerve fibre carries impulses to motor neurone.
Motor neurone carries impulse away from spinal cord to muscle.
The muscle (effector) contracts – pulling the hand away.

1 mark for each correct step – 5 marks
c. 
   i Increase surface area for more neurones to fit in.  
      DONOTCEPT it has a higher surface area and therefore folded.  
      2 marks
   ii Controls movement of voluntary muscle/ allows learning/interprets images
      Accept sight/hearing
      Any TWO or equivalent.  
      1 mark each – 2 marks

d. 
   i Root bends downwards /root shows positive geotropism
      1 mark
      Root will move deeper into the soil providing better anchorage and placing the plant in a better position to take up mineral ions and water  
      2 marks
   ii Shoot bends towards light /shoot shows positive geotropism
      1 mark
      Shoot exposes more surface area to sunlight thus ensuring more efficient photosynthesis.  
      2 marks

Total: 25 marks

4a. Homeostasis means keeping the internal environment constant.  
   2 marks

b. Amoeba has a contractile vacuole.
   1 mark
   The cytoplasm of the Amoeba is more concentrated than the freshwater it lives in. Thus osmosis occurs.  
   1 mark
   The contractile vacuole fills with excess water and then removes this water to the exterior.  
   1 mark
c.  
   i Urea  
   When a person eats a large protein meal so the body has more amino acids than needed.  
   ii  

   Front View of Urinary Tract

   0.5 mark for each correct label (Any four correct labels)– 2 marks  
   Correct diagram 3 marks

   Front View of Urinary Tract

   0.5 mark for each correct label (Any four correct labels)– 2 marks  
   Correct diagram 3 marks

   d.  
   i Increase in external environmental temperature will result in an increase in the core body temperature.  
   Body thermoregulates with the production of sweat  
   Loss of sweat by evaporation will cool down the body temperature.  
   ii Cells need insulin to take up glucose and convert to glycogen as a food store.  
   Award 0.5 mark if students mention to reduce blood sugar.  
   Award 1 mark if students mention diabetic person does not produce insulin.  
   iii Muscles contract and relax quickly – this produces heat. The heat generated in the muscles warms the blood as it flows through them. The blood distributes this heat all over the body.  
   e. Provision of dry clothes/moving child next to a warm environment such as a heater/removing cold clothes and covering child with a blanket/placing a hot water bottle next to armpits/ help child to take a warm bath/provide a warm drink or fluid such as soup.  
   Accept hug the child  
   Any THREE or equivalent.  
   3 marks
5a. The first name is the name of the genus it belongs to (and always has a capital letter); the second name is the name of the species (and always has a small letter).  

The binomial nomenclature system gives a unique name for identification.  

b. Fungi do not have chlorophyll and do not photosynthesise; instead they feed saprophytically or parasitically on organic material.  

c. When the seed begins to germinate, the amylase is activated and catalyses the breakdown of insoluble starch to soluble maltose in the seed. The maltose is used by the growing embryo as an energy source (and to make cellulose for new cell walls)  

d. Washing powders help greasy dirt to mix with water so it can be washed away. The enzymes help to break down other kinds of substances that stain clothes. Some of the enzymes are proteases that catalyse the breakdown of protein molecules such as meat sauce stains. Some of the enzymes are lipases that catalyse the breakdown of fats to fatty acids and glycerol.  

If students mention importance of cutting on electricity award only 1 mark.  

If students mention enzymes breakdown different types of foods award only 1 mark.  

e. Photosynthesis is important not only to green plants but to all living organisms. It is the basic reaction that brings the energy of the sun into ecosystems. The flow of energy in ecosystems is one way so there is a constant need for replenishment from the energy source and therefore a constant need for photosynthesis. Photosynthesis is important for the formation of biomass – this acts as a food reservoir for herbivores. Photosynthesis is also essential for maintaining a constant level of oxygen and carbon dioxide. The oxygen given off is available for respiration while the carbon dioxide is used for photosynthesis. This prevents the level of carbon dioxide from rising.  

f. This is because the skin in frogs contains glands that produce slime/mucus. The lungs of frogs are not very efficient so gas exchange takes place across the skin as well.  

DO NOT ACCEPT frogs breathe through the skin.  

6.  

i Step 1: Ovulation; the follicle bursts releasing an egg from the ovary  

Step 2: Follicle turns into a corpus luteum; lining of uterus becomes more vascular ready to receive the embryo if egg is fertilised.  

Step 3: Menstruation. As the egg has not been fertilised the uterus lining breaks down and is gradually lost through vagina.  

Total: 25 marks
Step 4: Inside the ovary a follicle containing an egg develops. The uterus lining is repaired.  

ii enlargement of mammary glands, growth of body hair on armpits, pubic hair, widening of hips, menstruation starts.  

b.  

i The placenta is joined to the foetus by the umbilical cord.  

ii Dizygotic twins are formed when two eggs are fertilised by two different sperms. Each embryo undergoes independent development and possesses its own placenta.  

iii Afterbirth- the placenta falls away from the wall of the uterus and passes away through the vagina.  

d.  

i The placenta is joined to the foetus by the umbilical cord.  

ii Dizygotic twins are formed when two eggs are fertilised by two different sperms. Each embryo undergoes independent development and possesses its own placenta.  

iii Afterbirth- the placenta falls away from the wall of the uterus and passes away through the vagina.  

iv Natural birth control methods involve the couple avoiding sexual intercourse completely (abstinence) when the woman has an egg in her oviducts/close, during and shortly after ovulation.  

v Chemical method: spermicide OR contraceptive pill OR morning after pill  

Physical method: condom/sheath/diaphragm/IUD  

(Do not accept surgical methods for physical methods of birth control.)  

c. Carbon monoxide reduces the amount of oxygen that the blood can carry and nicotine in the bloodstream prevents adequate glucose reaching foetal tissues including brain cells.  

Total: 25 marks  

7a.  

i apparatus/diagram showing nut on metal wire placed test-tube with known quantity of water in which a thermometer has been placed.  

ii Known quantity of the nut (kept constant for both nuts) ignited and held under test tube with known amount of water (kept constant for both nuts). The temperature of water before lighting the nut and after burning will be recorded.  

iii Initial temperature and inal temperature mass of peanut/almond  

iv Same mass of nut and same quantity of water  

v Heat loss to surroundings heat reaching water not evenly spread out burning of nut is not complete  

Any ONE  

b.  

i starch OR cellulose  

ii building blocks of body needed in metabolic reactions eg enzymes ultimate source of energy cell repair and growth  

Total: 25 marks
Any TWO 2 marks

c. Anaemia is a deficiency disease caused by lack of haemoglobin present in red blood cells. Iron is necessary for the formation of haemoglobin. 2 marks
d. i proteins/polypeptides
ii stomach/gastric glands
iii peptides/polypeptides (DO NOT ACCEPT amino acids) 1 mark each – 3 marks
e. i Fats release about twice the amount of energy as carbohydrates. They are more compact and therefore do not increase body weight quality. 3 marks
ii The optimum temperature for rennin is 40°C. This means that the enzyme works best at this temperature. Lowering the temperature will reduce the activity of the enzyme while increasing the temperature above 40°C will denature the enzyme. 3 marks

Total: 25 marks
1a.
i The rock pool is full of water during the wet season and dry/decreases during the dry season/summer. 1 mark

b.
i **Biotic factors**: living organisms affecting the environment of an organism 1 mark
ii **Abiotic factors**: physical factors/non-living factors in the environment of an organism. 1 mark

ii **Community**: plants of different species growing in the same rock pool 1 mark
**Population**: plants of the same species growing in the same rock pool 1 mark
DO NOT AWARD ANY MARK if students mention different types/kinds/groups

iii **Epigeal germination**: the cotyledons do not stay beneath the soil; instead they are lifted out of the soil. 1 mark
**Hypogeal germination**: the cotyledons stay below the ground. 1 mark

1. In order to compete the life cycle before the rock pool dries out. 2 marks
ii Oxygen 1 mark
iii Carbon dioxide + water ----- oxygen + glucose 4 marks
Awards 2 marks if chemical equation is given.
Award only 2 marks if sunlight and chlorophyll are omitted in the word equation
iv Low amounts of sunlight will reduce the rate of photosynthesis and therefore this results in reduced plant growth. 2 marks

d.
i epidermal cell – secretes waxy cuticle
palisade mesophyll cell - traps light for photosynthesis
spongy mesophyll cell - photosynthesis/ gaseous exchange
guard cell – opening and closing of stomata
xylem vessel cell – transport of water and mineral ions
phloem vessel cell – transport of products of photosynthesis
Any TWO 1 mark for correct cell name & 1 mark for correct function – 4 marks
ii reduces/prevents loss of water /reduces intraspecific competition
AWARD 1 mark if only competition is mentioned.
DO NOT AWARD ANY MARK if student mentions reduces the chances of extinction.

2 marks

e. So that plants can spread to new habitats. 2 marks

Total: 25 marks
Nervous system | Endocrine system
--- | ---
Fast acting | Slow acting
Short lasting effect | Long lasting effect
Affects specific parts of body | Widespread effect on body
Nerve impulses carry information | Chemical messengers/ Hormones carry information
Brain spinal cord nerves | Endocrine glands
Any ONE difference | 2 marks

b.
1. A reflex action is an automatic/rapid/involuntary/stereotyped/ immediate response of the body to a stimulus. 2 marks
DO NOT AWARD any mark if student mentions a reflex action is a response to a stimulus.
2. crying, coughing, grasping, blinking
Any TWO or equivalent. 4 marks

c.
1. pain receptor – receives stimulus/detects hot temperature 2 marks
2. sensory neurone – carries impulse from receptor to spinal cord 2 marks
3. motor neurone – carries impulse from spinal cord to muscle 2 marks
4. muscle – contracts to pull arm away 2 marks

d.
1 mark for correct direction/1 mark for correct cell bodies – 5 marks
i bends towards light / shows positive phototropism 2 marks

ii bends downwards towards gravity/shows positive geotropism 2 marks

Total: 25 marks

3a

i Excretion: the removal of waste products produced by the body 2 marks

Osmoregulation: regulation of the water and salt concentration in the body. 2 marks

ii Urea 2 marks

iii Amoeba has a contractile vacuole. 1 mark

The cytoplasm of the Amoeba is more concentrated than the freshwater it lives in. As a result osmosis occurs. 2 marks

The contractile vacuole fills with excess water and then removes this water to the exterior. 1 mark

b.

i renal artery 1 mark

ii ureter 1 mark

iii urinary bladder 1 mark

c.

i more sweat; reddening of face; vasodilation; increase in metabolism (Any TWO or equivalent) 2 marks

ii white/pale face; shivering; raising of hairs, bluish lips (Any TWO or equivalent) 2 marks

iii panting; reddening of face; increased heart beat; increased sweat production; vasoconstriction

Accept heart pumps more blood; glycogen used in muscles

Any TWO or equivalent 2 marks

d.

i Adipose tissue/subcutaneous fat layer 2 marks

Award only 1 mark if students mention under the skin.

ii efficient enzyme action; 2 marks

iii fatty acids and glycerol 2 marks

Total: 25 marks

4a.

i  F 1 mark

ii  A and E 2 marks

iii  B and C 2 marks

b. Presence of fins; streamlined body; body covered with scales/operculum 2 marks

Any TWO—DO NOT ACCEPT gills

c.

i unsegmented body; presence of a shell in most species. 2 marks

Accept soft body/muscular foot

ii It withdraws into its protective shell/ retreats into its shell and secretes a film of mucus. 1 mark

d.
<table>
<thead>
<tr>
<th>Organism B</th>
<th>Organism C</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 pairs of legs</td>
<td>3 pairs of legs</td>
</tr>
<tr>
<td>Body divided into two parts</td>
<td>Body divided into three parts</td>
</tr>
<tr>
<td>No antennae</td>
<td>1 pair of antennae</td>
</tr>
</tbody>
</table>

Any TWO - 2 marks each for each difference – 4 marks

e.
   i Cnidaria  1 mark
   
   Sac like body; single opening; presence of tentacles; presence of stinging cells
   1 mark for each characteristic – 2 marks
   
   ii Better competitors; produce more offspring; adapt better to changes in the environment; they are better predators; manage to escape predators easily/more tolerant and resistant to air pollution
   Any TWO or equivalent 2 marks each – 4 marks
   Accept their predators are decreasing
   
   iii Untreated sewage; litter in the sea; oil from boats/yachts
   Any TWO or equivalent 2 marks each – 4 marks
   
Total: 25 marks

5
a. This is because the skin in frogs contains glands that produce slime/mucus. 2 marks
The lungs of frogs are not very efficient so gas exchange takes place across the skin as well. 3 marks
DO NOT ACCEPT frogs breathe through their skin.

b. The first name is the name of the genus it belongs to (and always has a capital letter); the second name is the name of the species (and always has a small letter).
This binomial nomenclature system gives a unique name for identification 5 marks

c. Sulphur free fuel reduces the emission of sulphur dioxide in the atmosphere; thus this reduces the risk of acid rain caused by sulphuric acid and other acids. 5 marks

d. Most cars run on unleaded fuel because lead compounds in fuel are absorbed into the body from inhaled air and may slow down mental development and damage the liver. 5 marks

e. CFCs are very unreactive compounds that spread through the atmosphere without reacting with other substances and drift into the upper atmosphere. There they meet ozone that oxidises CFCs and in doing so is converted into oxygen. This is causing thinning of the ozone layer that protects animals and plants from ultraviolet radiation. Thus countries are taking measures to reduce the use of CFCs. 5 marks

Total: 25 marks

6a.
   i **Stage 1** : Ovulation; the follicle bursts releasing an egg from the ovary 4 marks
Stage 3: Menstruation. As the egg has not been fertilised the uterus lining breaks down and is gradually lost through vagina.

ii enlargement of mammary glands, growth of body hair on armpits, pubic hair, widening of hips, menstruation starts Any TWO or equivalent.

2 marks each – 4 marks

b. i carries useful substances to foetus; carries waste products away from foetus  4 marks
ii by the umbilical cord 1 mark
iii The placenta falls away from the wall of the uterus and passes away through the vagina. A process called afterbirth. 2 marks
iv Two placentas. 1 mark

c. Vasectomy; spermicide; sheath/condom 2 marks

Any TWO

d. Calendar/rhythm method – the time of ovulation is calculated after keeping a record of when the last six or more periods started.

Temperature method – the female measures her body temperature and looks for changes at ovulation

Billing/Mucus method – the female notes changes that take place in the mucus lining of the vagina and cervix at ovulation

1 mark for name 2 marks for explanation - 3 marks

Total: 25 marks

7. a. Correct drawing of line graph: including title (1), labelling of axis (1), correct scale (1) correct plotting (3).

DO NOT AWARD ANY MARK IF 1mm GRAPH PAPER IS NOT USED.

DO NOT AWARD ANY MARK IF AXIS ARE INVERTED/ IF HISTOGRAM OR BAR GRAPH IS PRESENTED

b. There is a general decrease in the birth rate from 1980 to 2006. 3 marks
c. Increased use of birth control methods; smaller family units 4 marks
d. Immigration, decreased death rate 4 marks
e. Increased sewage problems; increased urbanisation; more habitat destruction; more traffic and air pollution

Any TWO or equivalent 4 marks

f. i 13.9 – 13.3 = 0.6 0.6/13.3 x 100 = 4.5% 2 marks

ii 13.5- 10.7 = 2.8 2.8/13.5 x 100 = 20.7% 2 marks

Total: 25 marks
8a. i

ii Known quantity of the nut (kept constant for both nuts) ignited and held under test tube/boiling tube with known amount of water (kept constant for both nuts). The temperature of water before lighting the nut and after burning will be recorded.

iii Temperature before and after burning nut
Mass of nut

iv. Heat loss to surroundings
heat reaching water not evenly spread out
burning of nut is not complete
Any ONE

b. Same mass of nut and quantity of water
Any ONE

c.

i Fats
ii building blocks of body (for body growth/repair); involved in metabolic reactions e.g. enzymes; ultimate source of energy.
Any TWO

1 mark each – 2 marks

d.

i Proteins (Do NOT accept peptides)
ii Stomach/gastric glands
iii Peptides/dipeptides/polypeptides

1 mark each

– 3 marks

e. Iron is important in the formation of the red pigment haemoglobin present in red blood cells. Haemoglobin binds with oxygen and transports it to all cells.
Calcium is important for the strong formation of teeth and bones.

Total: 25 marks