M1.(a) stomach and pancreas correctly labelled

1

(b) bacteria not killed (by stomach acid / HCl) and so they damage mucus lining

1

so <u>acid / HCl</u> damages stomach tissue / causes an ulcer

allow bacteria infect stomach tissue

1

(c) if the cancer is malignant

1

(cancer) cells can spread to other organs

1

via the blood forming a secondary tumour

do not award marking points 2 or 3 without marking point 1

1

(d) add Biuret reagent to food sample

allow sodium / potassium hydroxide (solution) + copper sulfate(solution)

1

mauve / purple colour shows protein present

1

(e) damaged villi reduce surface area for absorption (of food molecules)

1

(therefore) fewer amino acids and glucose absorbed

1

with less glucose transfer of energy from respiration is reduced

1

and fewer amino acids available to build new proteins

1

[12]

M2. (a) any **two** from:

- diet

  ignore exercise

accept any reasonable reference to diet
*do **not** accept salt / blood pressure*
ignore age / gender / HDL / LDL

- heredity / genes / genetic makeup
- reference to cholesterol production by liver

2

(b) (i) Blood cholesterol concentration is only one of several factors affecting death from all causes

1

(ii) 170 – 210
accept 210 - 170

1

[4]

\

M3. (a) (substance / chemical) that affects body chemistry / chemical reactions in the body

1

(b) statin / aspirin / neither recommended

no mark, may be implied. If no recommendation or implication, max 4 marks

answers should be comparative

any **five** from:

- argued evaluation in favour of aspirin or statin or neither

answers could include reference to

*accept converse for statins / aspirin but **not** as advantage of one **and** disadvantage of other*

for statins:

- more people in studies
- so data / findings more repeatable

  accept reliable for repeatable

  ignore accurate / precise
- reduces cholesterol but aspirin doesn't

  allow reduces cholesterol but no evidence about aspirin
- aspirin (may) causes bleeding / poor clotting but statins do not

  allow aspirin causes bleeding / poor clotting but no evidence about statins
- smaller (total) percentage suffer side-effects
- monitored by doctor, aspirins not

for aspirin:

- cheaper
- can be bought over the counter rather than prescribed
- statins cause serious damage / muscle damage / kidney failure but aspirins do not

similarities:

- both have similar effect on reducing (non-fatal) heart attacks
- incidence of side-effects low in both

  allow (for aspirin) higher reduction of risk of heart attack

5

[6]

M4. (a) (concentration high) in the hepatic portal vein is blood with glucose absorbed from the intestine

1

concentration is lower in the hepatic vein because insulin

1

(has caused) glucose to be converted into glycogen

1

or

allows glucose into liver cells

(b) (i) (after 6 hours) most of the glucose has been <u>absorbed</u> from the intestine **or** from food into the blood

1

(ii) because glucagon (made in the pancreas) causes

if biological terms incorrectly spelt they must be phonetically accurate

*do **not** accept glucagon <u>made</u> / <u>produced</u> by the liver*

1

glycogen to be converted into glucose

1

glucose released into blood

allow the liver maintains the correct / constant level of glucose in the blood

1

[7]

M5.(a) stomach is acidic / has low pH

allow any pH below 7

ignore stomach is not alkaline

1

lactase works best / well in alkali / high pH / neutral / non-acidic conditions

allow any pH of 7 and above

accept works slowly in acid conditions

*allow figures from table with a **comparison***

ignore reference to temperature

1

(b) any **three** from:

- (below 40(°C)) increase in temperature increases rate / speed of reaction
- reference to molecules moving faster / colliding faster / harder / more collisions
- enzyme optimum / works best at 40°C

  allow value(s) in range 36 – 44

  ignore body temperature unless qualified
- high temperatures (above 40°C) / 45°C / 50°C enzyme denatured

  *allow synonyms for denaturation, but do **not** allow 'killed'*

  *denaturation at high <u>and</u> low temperature does **not** gain this mark*

  ignore references to time / pH

3

(c) any **two** from:

- acid neutralised or conditions made neutral / alkali

  accept bile is alkaline
- (allow) emulsification / greater surface area (of lipid / fat)

  allow description of emulsification eg fat broken down / broken up <u>into droplets</u>

  *do **not** accept idea of chemical breakdown*
- lipase / enzymes (in small intestine) work more effectively / better

  allow better for enzymes

  ignore reference to other named enzymes

2

[7]

M6. (a) (i) mitochondrion / mitochondria

must be phonetically correct

1

(ii) carbon dioxide / CO_2

1

water / H_2O

1

in either order
*accept CO2 but **not** CO^2*
*accept H2O **or** HOH but not H^2O*

(iii) diffusion

1

high to low concentration
allow down a concentration gradient

1

through (cell) membrane **or** through cytoplasm
*do **not** accept cell wall*

1

(b) ribosomes make proteins / enzymes

1

using amino acids

1

part A / mitochondria provide the energy for the process
allow ATP
*do **not** accept produce or make energy*

1

[9]

M7. A + B most effective (treatment)
ignore descriptions of LDL levels

1

D is (the most) effective (treatment)

D is the best single (treatment)

1

neither A nor B (alone) are effective

allow increase risk of heart disease instead of not effective

1

can't tell if C is effective**OR**A + C is not effective

1

[4]

M8. (a) (i) diaphragm

accept phonetic spelling

1

(ii) (because) the volume (inside the jar) increases

*maximum **two** marks if no reference to correct part of model*

1

(causing) the pressure to decrease

1

(and) air enters the balloon

allow oxygen

1

(b) (i) (so it moves by) diffusion

*do **not** allow osmosis or active transport*

1

from a high concentration (of oxygen) to a low concentration

*allow down its / oxygen concentration gradient from the air **or** to the blood*

or

(because) there is a high(er) concentration (of oxygen) in the air **or** there is a low(er) concentration of oxygen in the blood

ignore reference to amount of oxygen

1

(ii) many gill <u>filaments</u>

must be in the correct pairs to gain 2 marks

1

(give a) large surface / area

*do **not** allow surface area to volume ratio*

or

thin

(so) short diffusion pathway

or

good blood supply

(to) maintain the concentration gradient

or

water continually flows over them / continually ventilated

(to) maintain the concentration gradient

1

[8]