M1.(a)   C.

Ignore name of organ

1

(b)   E.

Ignore name of organ

1

(c)   1.   <u>Active site</u> (of enzyme) has (specific) shape / tertiary structure / <u>active site</u> complementary to substrate / malt<u>o</u>se;

Reject active site on substrate.
Must have idea of shape
Assume "it" = maltase
Accept (specific) 3D active site
Reject has same shape

2.   (Only) malt<u>o</u>se can bind / fit;

Accept "substrate" for "malt<u>o</u>se"

3.   To form enzyme substrate complex.

Accept E−S complex

3

[5]

M2.(a)   1.   Helicase;
2.   Breaks hydrogen bonds;
3.   Only one DNA strand acts as template;
4.   RNA nucleotides attracted to exposed bases;
5.   (Attraction) according to base pairing rule;
6.   RNA polymerase joins (RNA) nucleotides together;
7.   Pre-mRNA spliced to remove introns.

6 max

(b)   1.   Polymer of amino acids;
2.   Joined by peptide bonds;
3.   Formed by condensation;
4.   Primary structure is order of amino acids;

5.   Secondary structure is folding of polypeptide chain due to hydrogen bonding;

Accept alpha helix / pleated sheet

6.   Tertiary structure is 3-D folding due to hydrogen bonding <u>and</u> ionic / disulfide bonds;
7.   Quaternary structure is two or more polypeptide chains.

5 max

(c)   1.   Hydrolysis of peptide bonds;
       2.   Endopeptidases break polypeptides into smaller peptide chains;
       3.   Exopeptidases remove terminal amino acids;
       4.   Dipeptidases hydrolyse / break down dipeptides into amino acids.

4

[15]

M3.(a)   1.   Maltose;
             2.   Salivary amylase breaks down starch.

2

(b)   Maltase.

1

(c)   (Mimics / reproduces) effect of stomach.

1

(d)   1.   Add boiled saliva;
       2.   Everything same as experiment but salivary amylase denatured.

2

(e)   1.   Some starch already digested when chewing / in mouth;
       2.   Faster digestion of chewed starch;
       3.   Same amount of digestion without chewing at end.

Accept use of values from graph

3

[9]

M4.(a) 1. Add iodine / potassium iodide solution to the food sample;

1. Allow 'iodine'

2. Must be in the context of the correct reagent

2. Blue / black / purple indicates starch is present;

2

(b) 1. Starch digested to maltose / by amylase;

Ignore 'hard to digest / easily digested'

2. Maltose digested to glucose / by maltase;

3. Digestion of sucrose is a single step / only one enzyme / sucrase;

3. Accept converse for starch

3. Do not accept digestion of sucrose is faster

3

(c) 1. Smoking increases risk of CHD / introduces another variable;

1

(d) (i) 1. No effect on risk with diet group 1 and 2 / lowest glycaemic load;

Simple statement of correlation is not enough for this mark

2. Above diet group 2 / in higher groups, risk increases as glycaemic load increases;

1 max

(ii) 1. (Higher GL diets lead to) more (harmful) lipids (in blood), so greater risk of atheroma;

Ignore reference to lipids in diet

2. Atheroma leads to blockage of <u>coronary artery</u> / increased risk of blood clot in <u>coronary artery</u>;

Ignore references to myocardial infarction / heart attack

2

[9]

M5.   (a)   In one country where the percentage of fat (in the diet) is 35%, the death rate (from breast cancer) is 20 per 100 000;

> *Must* have reference to country
> *Accept … 1 per 5 000 / 0.02%*

1

    (b)   1.   No. of deaths from breast cancer divided by total population $\times$ 100 000;

        2.   No. of deaths from breast cancer divided by all deaths **×** 100 000;

        3.   Sample and count deaths from breast cancer in 100 000 people;

> *If sample not 100 000 then must scale appropriately*

1 max

    (c)   1.   Positive correlation;

        2.   But correlation does not show causation / some other (named) factor may be involved;

        3.   Evidence against positive correlation e.g. different death rates at same % fat / similar death rates at different % fat / some countries with higher death rate have lower fat intake;

> *1. Accept description of positive correlation / directly proportional.*
> *Accept positive relationship.*
> *2. Do not accept casual in place of causal.*
> *3. Answer must be consistent with data.*

3

[5]