M1.(a)   1.   Dissolve in alcohol, then add water;

           2.   White emulsion shows presence of lipid.

2

    (b)   Glycerol.

1

    (c)   Ester.

1

    (d)   **Y** (no mark)

          Contains double bond between (adjacent) carbon atoms in hydrocarbon chain.

1

    (e)   1.   Divide mass of each lipid by total mass of all lipids (in that type of cell);

           2.   Multiply answer by 100.

2

    (f)   Red blood cells free in blood / not supported by other cells so cholesterol helps to maintain shape;

                Allow converse for cell from ileum – cell supported by others in endothelium so cholesterol has less effect on maintaining shape.

1

    (g)   1.   Cell unable to change shape;

           2.   (Because) cell has a cell wall;

           3.   (Wall is) rigid / made of peptidoglycan / murein.

2 max

[10]

M2.(a)   1.   Starch formed from α-glucose but cellulose formed from β-glucose;

2.   Position of hydrogen and hydroxyl groups on carbon atom 1 inverted.

2

(b)   1.   Insoluble;
      2.   Don't affect water potential;
     OR
      3.   Helical;
             Accept form spirals
      4.   Compact;
     OR
      5.   Large molecule;
      6.   Cannot leave cell.

2

(c)   1.   Long and straight chains;
      2.   Become linked together by many hydrogen bonds to form fibrils;
      3.   Provide strength (to cell wall).

3

[7]

M3.(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]

M4.(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]

M5.(a) 1. **A**: phospholipid (layer);
1. Reject hydrophobic / hydrophilic phospholipid

2. **B**: pore / channel / pump / carrier / transmembrane / intrinsic / transport
<u>protein</u>;
2. Ignore unqualified reference to protein

(b) (i)   Condensation (reaction);

 (ii)   Organelle named; Function in protein production / secretion;
Function must be for organelle named
Incorrect organelle = 0

eg

1.   Golgi (apparatus);
1. Accept smooth endoplasmic reticulum

2.   Package / process proteins;

OR

3.   Rough endoplasmic reticulum / ribosomes;
3. Accept alternative correct functions of rough endoplasmic reticulum. ER / RER is insufficient
3. Accept folding polypeptide / protein

4.   Make polypeptide / protein / forming peptide bonds;

OR

5.   Mitochondria;

6.   Release of energy / make ATP;
6. Reject produce / make energy
6. Accept produce energy in the form of ATP

OR

7.   Vesicles;

8.   Secretion / transport of protein;