BY1

1.

	DNA	**RNA**
Contains a pentose sugar	✓	✓
Found in the nucleus	✓	✓
Thymine is never present	×	✓
Consists of a double helix	✓	×
Molecules short lived	×	✓
Associated with ribosomes	×	✓

[Total 6 marks]

2.

	Structural feature	**Function of feature**
Organelle		ribosome manufacture / synthesis rRNA;
Mitochondrion;		Increase surface area for enzyme attachment /ATP synthesis/ oxidative phosphorylation;
Lysosome;		
	stack of cisternae / flattened (membrane bound) sacs	Protein assembly /conjugation of proteins / secretion / lysosome formation/ produces vesicles/packaging or modification molecules/ stores and transports lipids/stores and transports lipids

[Total 6 marks]

3. (a) (i) alginate beads / gel membrane / meshwork of inert material / cellulose (not: entrapment unqualified) [1]

(ii) product easily recovered/not contaminated by enzyme;
so cheaper to use;
greater stability;
despite variations in/higher temperature / pH;
enzyme easily removed / added;
can control rate.
more than one enzyme can be used [3]

(b) (i) allows urea to pass through;
prevents passage of blood cells / other molecules/solutes;
so they can't affect results / enzyme / reduce enzyme activity. [2 max]

(ii) absorb/ref. ammonium ions;
converts into an electrical signal / changes chemical to electrical signal;
to record levels of urea. [2]

(c) increased temperature increases enzyme activity/rate of reaction;
more ammonium ions formed;
greater electrical current generated;
reference fair testing. [2 max]

(d) diabetes. [1]

[Total 11 marks]

4. (a) (i) arrow drawn pointing clockwise; [1]

(ii) segment drawn after telophase of roughly similar dimensions [1]

(b) replication of DNA;

increase in cell size;

chromosomes exist as chromatids;

replication of organelles/centrioles;

synthesis of ribosomal material;

synthesis of ATP;

synthesis of protein [4 max]

(c) (i) metaphase; [1]

(ii) anaphase [1]

(iii) anaphase; [1]

(iv) prophase; [1]

(v) telophase. [1]

[Total 11 marks]

5. (a) (i) C to B to A; [1]

(ii) water moves down a water potential gradient / high to low;

by osmosis; (not: ref. water concentration)

reference actual figures on diagram; [2]

(b) (i) Ψ = +1000 – 1800;

= - 800kPa [2]

(ii) plasmolysed; [1]

cell in concentrated solution / low water potential;

water passes out;

cytoplasm/vacuole shrinks. [2 max]
(not: cell membrane comes away from wall)

(c) (i) water passes into cell by osmosis;

cytoplasm expands;

cell becomes turgid;

as cytoplasm / contents push against wall;

wall inelastic / resists further expansion. (not:rigid) [3 max]

(ii) wilts. (not: dies) [1]

[Total 12 marks]

6. (a) (i) nitrogen containing part; [1]

(ii) arrow pointing to glycosidic bond; [1]

(iii) hydrolysis; [1]

(iv) hydroxyl groups point outwards;

link with neighbouring chains;

via hydrogen bonding;

to form microfibrils;

strong structure because of large number of hydrogen bonds;

chains associate in groups / fibres formed;

beta glucose units. [3 max]
ref. alternating rotation

(b) (i) tertiary; [1]

(ii) links between different parts of polypeptide chains;

produces a specific shape for the molecule / lysozyme;

reference to active site;

complementary to substrate;

allows enzyme – substrate complexes to form; [3 max]

(c) (i) mass/volume of tissue/sample; (not: amount/size)

concentration of hydrogen peroxide;

same time intervals between measurements;

equal volumes of hydrogen peroxide used;

pH;

temperature. [2 max]

(ii) most metabolically active;

produces most hydrogen peroxide;

needs to be broken down because of toxicity; [2 max]

[Total 14 marks]

7. (a) A. Singer Nicholson / fluid mosaic model; [1]

B. Phospholipids / lipid bilayer; [1]

C. Separate contents from outside / acts as barrier; [1]

D. Phospholipid allows fat soluble substances through / selective; [1]

E. Hydrophobic / water hating tails face each other; [1]

F. Hydrophilic / water loving heads face water / outwards; [1]

G. Carrier protein; [1]

H. Used for active transport; [1]

I. Specific substances transported; [1]

J. Cholesterol affects fluidity; [1]

K. Channel/carrier protein for facilitated diffusion; [1]

L. some are enzymes; [1]

M. Hydrophilic channels; [1]

N Glycoprotein / glycolipid; [1]

O. For cell recognition/signalling/hormonerecognition. [1]

[Total 10 marks]

7.	(b)	A.	Energy <u>storage</u>;	[1]
		B.	Release more energy per unit mass than carbohydrates;	[1]
		C.	Makes seeds lighter / smaller for dispersal / energy store for hibernation;	[1]
		D.	<u>Phospholipid</u> component of cell membrane;	[1]
		E.	Controls entry of molecules into cell;	[1]
		F.	Insulation;	[1]
		G.	Protection of (delicate) organs or e.g.;	[1]
		H.	Buoyancy for aquatic animals or e.g.;	[1]
		I .	consist of the elements carbon hydrogen and oxygen;	[1]
		J .	Glycerol plus three fatty acids;	[1]
		K.	Joined by condensation reactions;	[1]
		L.	Via ester bonds;	[1]
		M.	saturated and unsaturated fatty acids;	[1]
		N.	phosphate group present in phospholipids	[1]
		O.	water proofing+ wax/oils;hormones+ steroids; myelin sheath + insulation; AVP	

Any 5 structure i.e. points B, D, E, I to N and 5 others

[Total 10 marks]