Biology BY1

Q.1 needed for / found in / used in /component of chlorophyll;
(allow: middle lamella / enzyme co-factors)
component haemoglobin; enzyme Co factors
component nucleic acids/DNA/RNA/ATP/ (plasma) membrane/ phospholipids/ hardens bone / nucleotide;
hardens/deposited in bones/teeth/ossification/synaptic transmission
enzyme co-factors/middle lamella (not: strengthen bones) **[4]**

Q.2 cell wall;
beta/β;
glycosidic;
180;
hydrogen;
microfibrils; (not: microfibres) **[6]**

Q.3 (a) (i) higher water potential outside rbc/lower inside;
(not: ref solute concentration / ref water concentration)
water moves in <u>by osmosis</u>;
down water potential gradient;
ref. no cell wall to prevent bursting/cell
membrane unable to withstand pressure. **[3]**

(ii) 4g dm^{-3}; **[1]**

(iii) different concentration/solute/ water potential of contents;
requires different concentration of external salts/water potential, for movement of water/ to burst the cell **[2]**

(b) (i) temperature/pH;
change enzyme activity/reaction rate/diffusion rate/respiration rate
(not: time/root/ref fair test) **[2]**

(ii) active transport; **[1]**
is energy/ATP dependent;
aerobic respiration/oxygen required, to liberate energy/for <u>ATP</u> prod;
greater oxygen concentration produces greater uptake; **[2]**

(c) * all would be 7au; **[1]**
cyanide inhibits <u>aerobic</u> respiration/ inhibits cytochrome oxidase/ stops/ reduces prevents ATP production;
when no oxygen is present there is still some uptake;
by diffusion;
which is a passive process; **[2]**
must have *. Plus 2 others

(Total 14 Marks)

Q.4 (a) **[4]**

Role	Mitosis	Meiosis
	✓	X
	X	✓
	X	✓
	✓	✓

(not: hybrid ticks)

(b) joined pair of chromatids;
chromatid labelled and centromere labelled; **[2]**

(c) centromere splits;
chromatids pulled to (opposite) poles;
by shortening/ contraction of spindle fibres; **[3]**

(d) centrioles; **[1]**

(Total 10 Marks)

Q.5 (a) (i) glycerol;
(3) fatty acids; **[2]**

(ii) ester; **[1]**
hydrolysis;
chemical insertion of water/water added to bond **[2]**

(iii) energy storage / respiratory substrate/source of energy
waxy cuticle/leaf waterproofing;
membrane structure; **[2]**

(Total 7 Marks)

Q.6 (a) (i) mitochondrion; **[1]**

(ii) aerobic respiration / production / manufacture of ATP; **[1]**
(not: make ATP for respiration)

(ii) A = cristae;
B = matrix; **[2]**

(b) metabolically active/ many chemical reactions or specified eg active transport
large amount of ATP produced/required; **[2]**

(Total 6 Marks)

Q.7 (a)

	DNA	m-RNA
Name of sugar	deoxyribose	ribose;
Number of carbon atoms in sugar	five	five;
Number of polynucleotide chains in molecule	two	one;
Location in cell	nucleus	nucleus + cytoplasm; (allow: RER/ ribosomes)

[4]

(b) (i) base pairing;
Complementary/ adenine with thymine;
not identical because of experimental error; **[3]**

(ii) passed on from parents/during fertilization/inherited/zygote formation;
from same cell/mitosis;
DNA replication;
genetically identical / same base sequence/ all body cells have same DNA **[3]**

(iii) half as much; DNA (not: ref chromosomes)
variation/ genetically different
produced by meiosis; **[3]**

(Total 13 Marks)

Q.8 (a) A. polar molecule/dipole;

B. uneven distribution of charges/H^+O^-;

C. forms hydrogen bonds (between molecules);

D. dissolves ionic/polar substances; (not: ref glucose/solvent unqual)

E. used for transportation of molecules;

F. high latent heat of evaporation / vapourisation / large amount of heat energy needed to make water evaporate

G. has a role in cooling body;

H. high specific heat / large amount of heat energy needed to raise temp

I. helps maintain stable/constant environmental temperature; (not: Internal)

J. (transparent) to allow light through for photosynthesis

K. molecules of water stick together / (high) cohesion (not: adhesion)

L. allows movement through xylem/ adhesion (not: ref capillarity)

M. surface tension allows insects to walk on water or example

N. reactant in photosynthesis/hydrolysis or description (not: used in Photosynthesis)

O. ice less dense than water so floats on surface therefore insulation of pond life when ice forms / correct ref to buoyancy qual

P. chemical reactions occur in solution

(Points F and H only in correct context of explanation) **[Total 10 marks]**

(b) (i) A. two types, competitive and non-competitive;

B. both types of inhibitors reduce rate of reaction;

C. competitive inhibitor complementary to active site / structurally similar to substrate;

D. competes with substrate for active site of enzyme;

E. blocks active site/prevents substrate from binding to active site

F. fewer/ no enzyme substrate complexes formed;

G. increase substrate concentration reduces effect of inhibitor;

H. non-competitive binds away from active site/ binds at allosteric site

I. changes shape/conformation of enzyme molecule;

J. shape/conformation of active site changed;

K. increasing substrate concentration has no effect on rate of reaction **[7]**

(ii) L. enzymes tolerate wider range of conditions/temp/pH/thermostable/ Owtte (not: stable unqual)

M. enzyme easily reused;

N. several enzymes can be used together;

O. product not contaminated / easier purification of product

P. greater central of reaction achieved/ enzymes easily added or Removed qual. **[3]**

(Total 10 Marks)