Mark schemes

Q1.

(a) 1. (In) DNA;

2. (In) RNA;

If neither DNA or RNA named allow 1 mark for nucleotide/nucleic acid/phosphodiester bond/sugar-phosphate backbone

3. (In) ATP/ADP;

Accept any other correct biological compound containing phosphate; eg (in)RuBP or GP or triose phosphate or NAD

4. Phosphorylation;

Accept binds with substance to make it more reactive

5. (In) phospholipids;

2 max

(b) 1. Increased (plasma) acidity

OR

Decreased (plasma) pH;

2. Denatures (protein)

OR

Changes (protein) tertiary structure

OR

Changes active site (shape)

OR

Changes antigen-binding site (shape);

Accept description of bond changes, eg 'disrupts hydrogen/ ionic bonds' for 'changes in tertiary structure'

2

(c) 1. Equal positive and negative (in both);

Accept answers in either order

Ignore reference to sodium ions

Accept no overall charge or no net charge

2. Higher (ion concentration) in cytoplasm;

Ignore more ions in cytoplasm

2

(d) 1. (Sodium) ions move in (to cells) by <u>facilitated</u> diffusion down a concentration gradient;

Accept a description of the concentration gradient, eg from high (concentration) to low (concentration)

2. (Sodium) ions move out (of cells) by active transport against a concentration gradient;

Accept a description of transport against a gradient, eg from low (concentration) to high (concentration)

2

[8]

Q2.

(a) 1. (Is) charged/polar

OR

(Is) part of haem(oglobin);

*Accept Fe^{2+} **OR** Fe^{3+} for 'charged'*

2. (So) binds/associates/loads (with) oxygen

OR

(So) forms oxyhaemoglobin

OR

(So) transports oxygen;

Accept 'carries' for transports

2

(b) 1. Less/no ferroportin hydrolysis/breakdown;

Accept 'channel protein' for ferroportin

2. (So) more ferroportin (in cell-surface membranes);

Accept 'channel protein' for ferroportin

Accept 'many' for more

3. (So) more iron (ion) transport **from** cytoplasm/cell;

Accept 'many' for more

3

(c) Correct answer for 2 marks = 30.52:1 / 30.5:1 / 31:1;;

Accept for 1 mark,

31 (ratio not given)

OR

30:1 (incorrect rounding)

OR

200 (correct mass in healthy person)

OR

1526 (correct iron concentration in person with haemochromatosis)

OR

6104 : 200 (correct ratio, but not simplified)

Accept for 1 mark any correct ratio (not simplified)
e.g. 763:25 or 1526:50

2

[7]