Mark schemes

Q1.

(a) 1, 2 and 3. Mark in rows;;;

	Prokaryote cell	**Nucleus**	**Chloroplast**
	✓		✓
	✓	✓	✓
		✓	

3

(b) 1. and 2. Correct calculated answer of 20(%) = **2 marks**;;

1. and 2. incorrect calculated answer but evidence of 0.72 / 720 000 and 0.18 / 180 000(correct readings from the Figure) = **1 mark**

OR

0.9 / 900 000 (correct total number of deaths) = 1 **mark**

OR

Correct calculation using incorrect graph readings = **1 mark**

OR

0.2 (correct answer but not expressed as a percentage) = 1 **mark**;

(Incorrect mathematics step)

3. Used 0.72 **not** 0.9 (as denominator)

OR

0.9 was not the denominator

OR

0.72 was the denominator = **1 mark**;

*Accept used 0.72 **if** 0.9 is also shown as the denominator in the calculation*

Accept divided by for denominator

Accept the incorrect calculation shown e.g. 0.18 ÷ 0.72

Accept description of incorrect method e.g. 'The associated not the total is used'

3

(c) Vaccinate more people to reach herd immunity against bacteria that cause diseases common in human populations.

1

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Q2.

(a) 1. Sequence/order of amino acids;

2. (Joined by) peptide bonds;

2

(b) 1. (Universal) The same codon/triplet always codes for the same amino acid;

2. (Non-overlapping) Each base is only part of one triplet/codon

OR

(Adjacent) codons/triplets do not overlap;

Accept '3 bases' for triplet

Accept 'base/triplets/codons only read once'

3. (Degenerate) More than one codon/triplet codes for each amino acid;

3

[5]

Q3.

(a) 1. Nucleus;

2. Nucleolus/nucleoli

OR

Nuclear membrane/envelope;

3. Mitochondria/chloroplast contain DNA;

Accept 'membrane bound nucleus' = 2 marks

2 max

(b) (In prokaryotes) Circular not linear

OR

Not associated with proteins/histones

OR

No introns;

Ignore 'loop'

Ignore 'plasmid'

1

(c) 1. Diaphragm (muscles) contract **and** diaphragm flattens/pulled down;

2. External intercostal muscles contract **and** ribcage pulled up/out;

3. (Causes) volume increase **and** pressure decrease in thoracic cavity (to below atmospheric pressure);

Accept lungs or thorax for 'thoracic cavity'

3

(d) 1. (Thicker capsule so phagocytes) less likely to bind to **murein** (in cell wall)

OR

(Thicker capsule so phagocytes) less likely to be stimulated by **murein** (in cell wall);

2. Reduced phagocytosis **so** more bacterial growth/division/reproduction/binary fission;

Accept replicate/ multiplication but reject mitosis

2

[8]