

Question 2 (Answer: C)

- The *number* of bases just reflects the size of the genome, and there are only four types in every organism.
- What differs between species is the *order* in which those bases run.
- So classification uses the base sequence of the DNA, which is why closely related species have more similar sequences.

Question 1 (Answer: A)

- A scientific name is genus followed by species.
- Both rats are *Rattus*, so they share a genus.
- The second words differ – *norvegicus* and *rattus* – so they are different species.

Question 2 (Answer: B)

- A cell with no nucleus is a prokaryote (bacterium).
- A cell with a cell wall and chloroplasts is a plant cell.
- A cell with a nucleus but no cell wall is an animal cell.

Question 2 (Answer: B)

- The binomial system uses two names.
- The first is the genus and the second is the species.
- Kingdom is a much broader group and never appears in the scientific name.

1(a)	go to 2	
	go to 4	
	go to 3	
	<i>Vibrio cholerae</i>	D
	<i>Helicobacter pylori</i>	B
	<i>Salmonella typhi</i>	E
	<i>Treponema pallidum</i>	C
	go to 5	
	go to 6	
	<i>Staphylococcus aureus</i>	A
	<i>Streptobacillus moniliformis</i>	G
	<i>Streptococcus pyogenes</i>	F
	;;;	
1(b)(i)	<i>radius</i> : 0.25 μm ; <i>volume</i> : 0.39 μm^3 ;;;	
1(b)(ii)	prokaryote ;	
1(c)(i)	J protein coat ; K genetic material ;	
1(c)(ii)	<i>any two from</i> : cell wall ; cell membrane ; circular / loop of, DNA ; plasmid ; cytoplasm ; ribosome ; AVP ;;	

1(a)	genus AND species ;
1(b)	fungus / fungi ;
1(c)(i)	<i>any two from:</i> 1 chloroplast ; 2 cell wall ; 3 (large permanent) vacuole ; 4 AVP ;
1(c)(ii)	<i>any four from:</i> <i>species X</i> 1 fern ; 2 spores ; 3 fronds ; <i>species Y</i> 4 monocotyledon ; 5 narrow / long / AW, leaves ; 6 parallel veins ;
1(c)(iii)	<i>any two from:</i> 1 use, base / amino acid / nucleotide / gene, <u>sequences</u> OR <u>sequence</u> , DNA / RNA / AW ; 2 (crops with) recent ancestors / closely related species, will have more, sequences / genes / alleles in common / will have similar, sequences / genes / alleles ; 3 AVP ;

Question 2 (Answer: B)

- The more bases two sequences share, the more closely related the species are.
- So compare the four sequences base by base and count the matches.
- The pair differing at the fewest positions is the most closely related.

5(a)(i)	A - hair / external ears ; B – wings / feathers ;
5(a)(ii)	apes and rodents ;
5(a)(iii)	<i>most similar</i> – birds ; <i>least similar</i> – sharks ;
5(b)	<i>any four from:</i> 1 ref. to <u>two</u> strands / chains ; 2 <u>double</u> helix ; 3 ref. to <u>four</u> bases / A, T, C, G ; 4 A pairs with T and C pairs with G ; 5 ref. to <u>bonds</u> between bases ;
5(c)	<i>any three from:</i> (base sequences of DNA / mRNA) determine sequence of amino acids ; amino acids form proteins / protein synthesis / production of proteins ; named example of protein ; ref. to sequence of amino acids determining protein shape ;

Question 1 (Answer: C)

- A more recent common ancestor means a closer relationship and more similar DNA.
- P and Q share a more recent ancestor with each other than with R, so P and Q are the closest pair.
- S branched off earliest, so it is the most distantly related of the four.