AQA AS/A-level Year 1 Biology exam practice answers

4 Genetic information, variation and relationships between organisms

**1** Domain, kingdom, phylum, class, order (all five needed for 1 mark).

**2 (a)** Any three from: human/human DNA has the most base sequences in common; so it has the most complementary bases; and the most hydrogen bonds; making the two strands harder to separate.

 **(b)** **(i)** Orang utan

**(ii)** Any two from: human/orang utan DNA denatures at the lowest temperature; so it has the fewest hydrogen bonds; and so it has the fewest base sequences in common; (because the longest time has elapsed since there was a common ancestor and so there has been more time for mutations to make differences in base sequences).

**3 (a)** It is present in all species.

 **(b)** 104 × 3 = 312 (or 318 if you include the start and stop codons).

 **(c)** Most genes contain introns (base sequences that do not code for the protein).

 **(d)** **(i)** Fruit fly

**(ii)** Fruit flies have the most differences in amino acids sequence; so had the most distant common ancestor; so there has been the longest time for mutation to create amino acid differences.

**(e)** For: they do appear to be more distantly related: 15 differences compared with 14. Against: mutation is a random process, so measuring relatedness like this is not totally reliable

**4 (a)** Without bias (without conscious choice on the part of the experimenter).

 **(b)** Habitat A, because evenness refers to how close each species is in terms of numbers.

 **(c)** $d=\frac{N\left(N-1\right)}{Σn\left(n-1\right)}=94 ×\frac{93}{484}=1.17$

 **(d)** Any three from: use of pesticides/herbicides; deforestation; agriculture/monoculture; hunting/trapping.

**5**

|  |  |  |
| --- | --- | --- |
|  | **Mitosis** | **Meiosis** |
| DNA replicates | ✓ | ✓ |
| Chromosome number is maintained | ✓ | ✗ |
| Homologous chromosomes pair up | ✗ | ✓ |

**6 (a)**

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 **(b)**

