

DNA

Q1.a(2018)

B double helix

1. The only correct answer is B

A is not correct because the shape of a DNA molecule is not a single helix

C is not correct because the shape of a DNA molecule is not a complementary helix

D is not correct because the shape of a DNA molecule is not a triple helix

Q1.b(2018)

A sugars and phosphates

1. The only correct answer is A

B is not correct because amino acids and bases are not present in the DNA backbone

C is not correct because bases are not present in the DNA backbone

D is not correct because amino acids are not present in the DNA backbone

Q1.c(2018)

(weak) hydrogen (bonds)

Q2.(2018)

- homogenise cells(1)

- mix cells with a salt/detergent (solution)(1)

Q3.a(2019)

A each pair of bases is joined by hydrogen bonds

5ai The only correct answer is A

B is not correct because phosphate groups are not joined by hydrogen bonds

C is not correct because nucleotides consist of a sugar, a phosphor group and a base

D is not correct because bases are not joined to phosphate molecules

Q3.b(2019)

An answer that combines points of interpretation/evaluation to provide a logical description:

- amount of C and G is equal/amount of A and T is equal
- A pairs with T and C pairs with G

Q3.c(2019)

division

$$0.0062 \div 2 / 6.2 \div 2 (1)$$

OR

unit conversion

$$0.0031 \times 1000 / 0.0062 \times 1000 (1)$$

3.1 (picograms)

Q3.d(2019)

to precipitate the DNA

Q3.e(2019)

Any two from:

- mass of fruit (1)
- volume of buffer (1)
- crushing method /crushing time / crushed evenly (1)
- volume of ethanol (1)
- temperature (1)
- pH /same buffer solution (1)

Q3.f(2019)

Any one from:

- to obtain more data (1)
- to identify anomalies (1)
- see if the results are {the same / reliable/correct} (1)
- to calculate a {mean/average} (1)

Q4.(2020)

Structure of DNA

- polymer
- four bases (A, T, C, G)
- (complementary) base pairs
- A-T and C-G
- (weak) hydrogen bonds join bases
- two strands
- double helix
- nucleotides

DNA extraction

- crush up / grind / squash cells
- add detergent / salt solution / protease
- heat in a water bath / heat to 60°C
- add to (ice cold) ethanol
- DNA forms as a precipitate /white strands

Q5.(2022)

A description linking **two** from:

weak (1)

hydrogen bonds (1)

complementary bases (1)

A – T / C – G (1)

Q6.a(2022)

T	T	G	A	T	T	G	C	G	T	A	A
A	A	C	T	A	A	C	G	C	A	T	T

award 1 mark for all the As and Ts in the top line correctly paired (1)

award 1 mark for all the Cs and Gs in the top line correctly paired (1)

Q6.b(2022)

B 4

The only correct answer is B

A is incorrect because 3 amino acids would need 9 bases to be present

C is incorrect because 6 amino acids would need 18 bases

D is incorrect because 12 amino acids would need 36 bases

Q6.c(2022)

D double helix

The only correct answer is D

A is incorrect because a DNA molecule is not three separate strands

B is incorrect because the DNA molecule consists of two strands

C is incorrect because a DNA molecule is a double helix not a single helix

Q7.a(2022)

An explanation linking **two** from:

- (protease) breaks down proteins (1)
- in the {cell/nuclear} membrane (1)
- destroys enzymes that may break down the DNA (1)

Q7.b(2022)

to precipitate the DNA /
because DNA is insoluble in
ethanol

Q7.c(2022)

Any **two** from:

- mass of peas and beans (1)
- method of crushing (1)
- volume of {washing up liquid / detergent} / water (1)
- volume of protease (1)
- temperature if qualified (1)
- volume of ethanol (1)
- time if qualified (1)

Q8.a(2024)

- salt (1)
- membranes (1)

must be in the correct order

Q8.b(2024)

A description including:

- pour the contents (of the beaker) into the **funnel** (1)
- (into) filter paper / to filter (it) (1)
- to separate DNA (1)

Q8.c(2024)

C white

The only correct answer is C

A is incorrect because the precipitate is not blue

B is incorrect because the precipitate is not

orange

D is incorrect because the precipitate is not red

Q8.d(2024)

B 10.4

The only correct answer is B

A is incorrect because the range is not 13.2

C is incorrect because the range is not 5.9

D is incorrect because the range is not 5.3

Q8.e(2024)

6.4