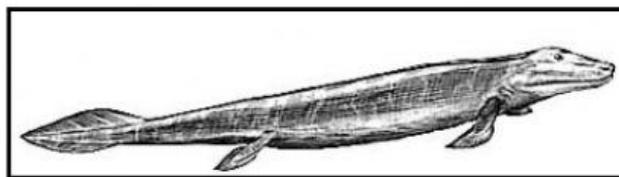


## SECTION A

### QUESTION 1

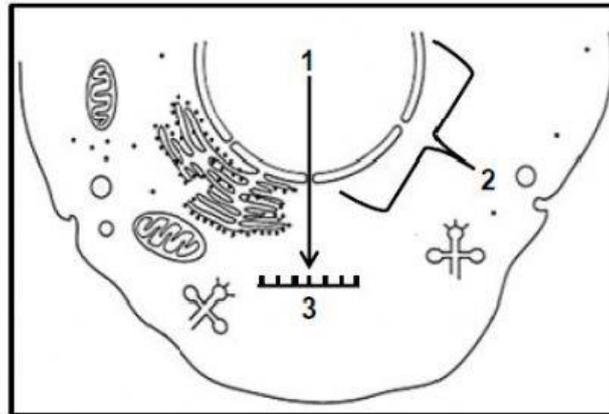
- 1.1.1 Which ONE of the following may result in Down syndrome in humans?
- A A gene mutation on chromosome 21
  - B Failure of chromosome pair 21 to separate during anaphase I
  - C Failure of the gonosomes to separate during meiosis II
  - D A gene mutation occurs on the X chromosome
- 1.1.2 Variation within a species is introduced through ...
- A random mating and asexual reproduction.
  - B mitosis and random fertilisation.
  - C random mating and random fertilisation.
  - D mitosis and meiosis.
- 1.1.3 African apes and humans are similar. Both have ...
- A small jaws and well-developed brow ridges.
  - B opposable thumbs and bare fingertips.
  - C gaps between their teeth and eyes in front.
  - D an upright posture and a cranial ridge.
- 1.1.4 The diagram below shows *Tiktaalik roseae*, a fish that may be the ancestor of the first organisms to live on land.



According to Lamarck, this species of fish may have evolved the ability to 'walk' on land by ...

- A undergoing natural genetic mutations which caused the fins to develop into legs.
- B the process of natural selection.
- C passing on the acquired characteristic of fins to their offspring.
- D stretching its fins and using them for 'walking'.

- 1.1.5 The diagram below shows some of the processes, molecules and structures that are involved in protein synthesis in a cell.



Which ONE of the following is the CORRECT labels for 1, 2 and 3 in the diagram?

	PROCESS 1	STRUCTURE 2	MOLECULE 3
A	transcription	ribosome	tRNA
B	translation	ribosome	mRNA
C	transcription	nucleus	mRNA
D	translation	nucleus	tRNA

- 1.1.6 A homozygous purple flowering plant (P) is crossed with a pink flowering plant (p) to produce the F<sub>1</sub>-generation. One of the F<sub>1</sub>-plants is crossed with the pink flowering parent to produce the F<sub>2</sub>-generation.

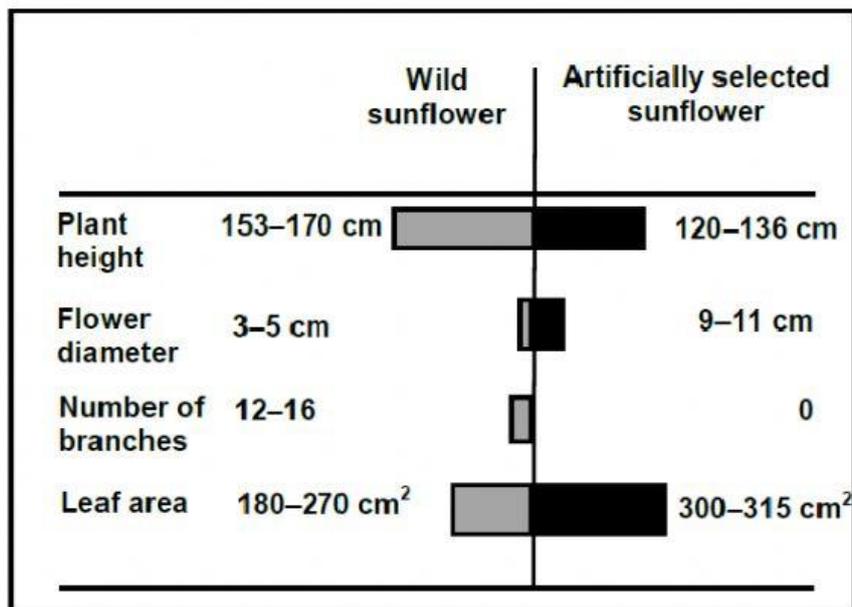
Which ONE of the following is the CORRECT phenotypic ratio of the F<sub>2</sub>-generation?

- A 1 purple : 1 pink
- B 1 purple : 3 pink
- C 3 purple : 1 pink
- D 1 purple : 2 pink

1.1.7 Which ONE of the following scientists discovered fossils of *Homo sapiens* and *Ardipithecus sp*?

- A Raymond Dart
- B Lee Berger
- C Louis Leakey
- D Tim White

1.1.8 The diagram below compares characteristics of wild sunflowers with sunflowers that have been artificially selected.



Which ONE of the following characteristics was found undesirable by humans?

- A Number of branches and leaf area
- B Plant height and leaf area
- C Plant height and flower diameter
- D Plant height and number of branches

1.1.9 Punctuated equilibrium suggests the following:

- A Evolution is always a slow and gradual process.
- B Natural selection does not explain evolution.
- C New species can appear quickly, over a relatively short period of time.
- D Artificial selection is the only mechanism that causes evolution.

1.1.10 A group of students observed that the long-term use of antibiotics results in the decreased control of bacterial infections.

From this observation the students stated that:

Antibiotic resistance in bacteria is caused by the long-term use of antibiotics.

This statement is a/an ...

- A theory.
- B aim.
- C hypothesis.
- D conclusion.

(10 x 2) (20)

1.2 Give the correct **biological term** for each of the following descriptions.

1.2.1 Similar structures in different organisms indicating descent with modification

1.2.2 Large, pointed teeth in African apes that are used for tearing food

1.2.3 The part of the skull that houses the brain

1.2.4 The non-sex chromosomes in humans

1.2.5 The network of genetic material found in the nucleus during interphase

1.2.6 The number, shape and arrangement of all the chromosomes in the nucleus of a somatic cell

1.2.7 Having a protruding jaw

(7 x 1) (7)

COLUMN I	COLUMN II
1.3.1 Long and narrow pelvis	A: African apes B: Humans
1.3.2 The point of attachment of two overlapping chromatids	A: Locus B: Chiasma
1.3.3 Variation in human height	A: Continuous B: Discontinuous

