

**Biology Paper 2:
Foundation**

Practice Questions - Set 1

Name: _____

Class: _____

Date: _____

Time: **43 minutes**

Marks: **41 marks**

Comments:

Q1.

Hormones are involved in controlling the menstrual cycle and fertility.

- (a) (i) Use the correct answer from the box to complete the sentence.

auxin	follicle stimulating hormone (FSH)	thalidomide
--------------	---	--------------------

A hormone produced by the pituitary gland is _____

(1)

- (ii) Use the correct answer from the box to complete the sentence.

luteinising hormone (LH)	oestrogen	statin
---------------------------------	------------------	---------------

A hormone produced by the ovaries is _____

(1)

- (b) (i) Why are fertility drugs given to some women?

(1)

- (ii) A doctor injects fertility drugs into a woman. After the injection, the hormones travel to the woman's ovaries.

How do the hormones travel to the ovaries?

Draw a ring around the correct answer.

**through the
bloodstream**

**through the
neurones**

**through the
skin**

(1)

- (c) Which **two** hormones are used in contraceptive pills?

Tick (✓) **two** boxes.

FSH	<input type="checkbox"/>	oestrogen	<input type="checkbox"/>
LH	<input type="checkbox"/>	progesterone	<input type="checkbox"/>

(2)

(Total 6 marks)

Q2.

Some students investigated the effect of drinking caffeine on reaction time.

They used a drink containing 32.25 mg of caffeine per 100 cm³

This is the method used.

1. Divide the students into four groups, **A**, **B**, **C** and **D**.
2. Measure and record the reaction time of each student using the ruler-drop test.
3. Students in:
 - group **A** drink 200 cm³ of water
 - group **B** drink 200 cm³ of the caffeine drink
 - group **C** drink 400 cm³ of the caffeine drink
 - group **D** drink 600 cm³ of the caffeine drink.
4. Repeat step 2 after 15 minutes.

(a) Describe how to do the ruler-drop test.

(3)

(b) **Table 1** shows the mass of caffeine taken in by each student.

Table 1

Group	Mass of caffeine in mg
A	0
B	64.5
C	129.0
D	X

Calculate value **X**.

X = _____ mg

(1)

(c) Why did group **A** drink water instead of the caffeine drink?

(1)

Table 2 was used to convert the results of the ruler-drop test into reaction times.

Table 2

Distance in cm	Reaction time in s	Distance in cm	Reaction time in s
2	0.064	28	0.239
4	0.090	30	0.247
6	0.111	32	0.256
8	0.128	34	0.263
10	0.143	36	0.271
12	0.156	38	0.278
14	0.169	40	0.286
16	0.181	42	0.293
18	0.192	44	0.300
20	0.202	46	0.306
22	0.212	48	0.313
24	0.221	50	0.319
26	0.230	52	0.326

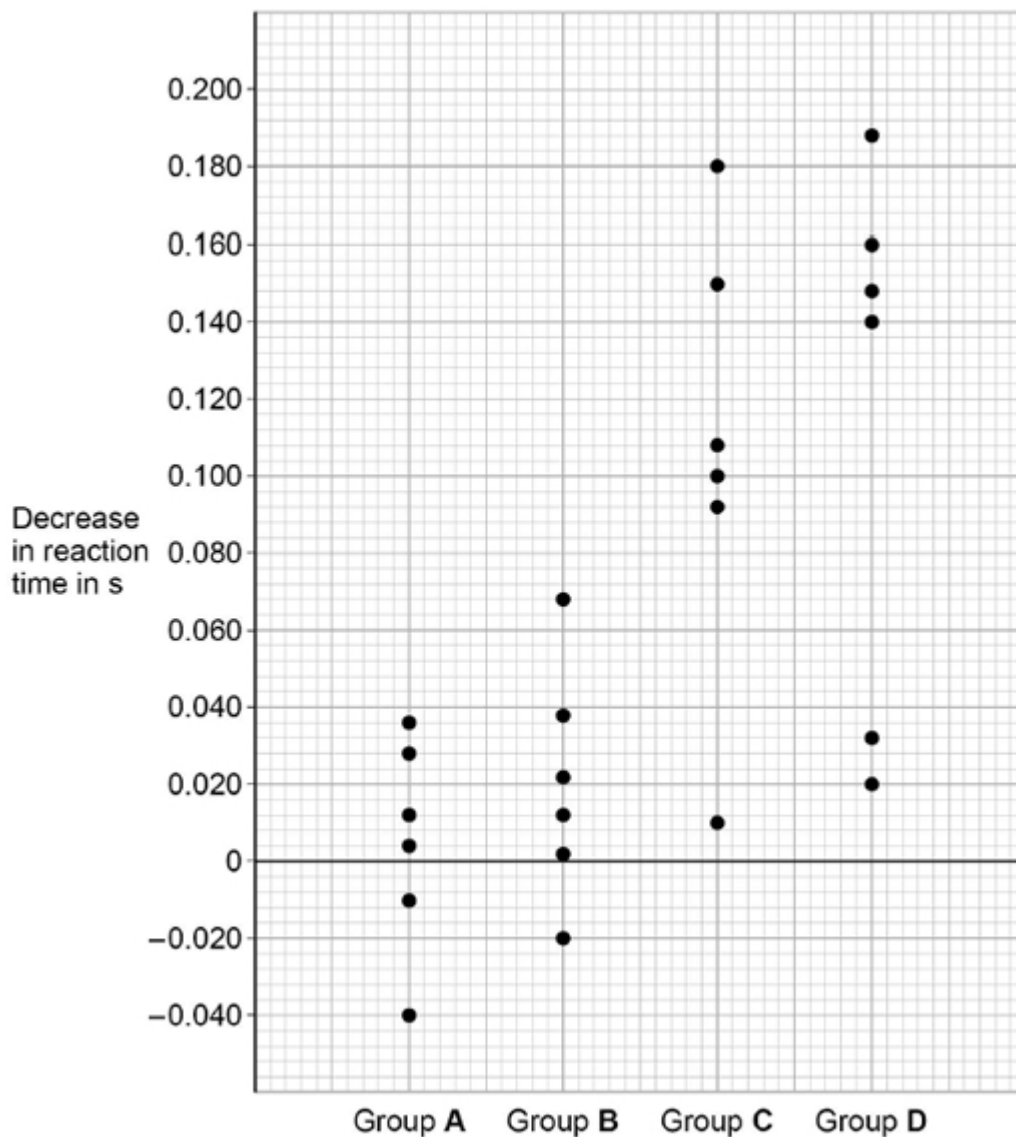
(d) Estimate the reaction time for a student who recorded a distance of 23 cm

Reaction time = _____ s

(1)

Students calculated the decrease in their reaction time after the drink compared with before the drink.

The graph shows the results for each student.



- (e) Describe the effect of the mass of caffeine taken in on the decrease in reaction time.

(1)

- (f) For three students the decrease in reaction time was negative.

Give the reason why the value was negative.

(1)

- (g) What is the range of results for group C?

(1)

(h) Suggest **two** variables that should have been controlled in this investigation.

1 _____

2 _____

(2)

(i) Explain why the ruler-drop test does **not** involve a reflex action.

(2)

(Total 13 marks)

Q3.

Living things can be classified into groups.

(a) Scientists look at structures inside cells to classify living things.

Suggest **one** structure found in cells that can be used to classify living things.

(1)

(b) The table below shows one system for classifying humans.

X	Animalia
Phylum	Chordata
Class	Mammalia
Order	Primates
Family	Hominidae
Genus	<i>Homo</i>
Species	<i>Sapiens</i>

Who devised this system of classification?

Tick **one** box.

Darwin

Linnaeus	<input type="checkbox"/>
Wallace	<input type="checkbox"/>
Woese	<input type="checkbox"/>

(1)

(c) Look at the table above.

X is the largest category in this classification.

Name category **X**.

(1)

(d) Give the **binomial name** of humans.

Use information in the table above.

(1)

(e) Suggest **one** way that classification systems are useful to scientists.

(1)

(Total 5 marks)

Q4.

There has been a rapid increase in the percentage of carbon dioxide in the atmosphere since 1960.

(a) Carbon dioxide is a greenhouse gas that contributes to global warming.

Name **one** other greenhouse gas.

(1)

(b) Global warming causes climate change.

Give **two** effects of climate change.

1 _____

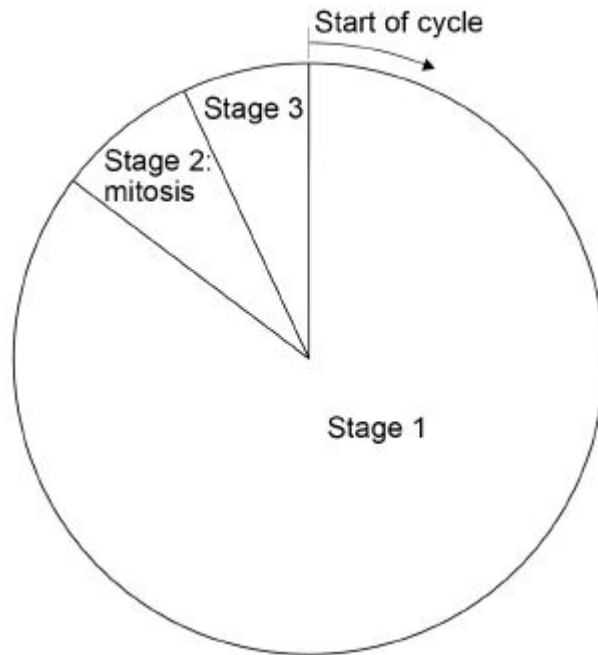
2 _____

Q5.

Cells divide in a series of stages called the cell cycle.

Stage 2 of the cycle is mitosis.

The diagram below shows a simplified cell cycle for a human body cell.



(a) Draw **one** line from each stage in the cell cycle to what happens during that stage.

Stage in the cell cycle	What happens during that stage
Stage 1	Nucleus divides
Stage 2	Cell divides into two
Stage 3	Copies of the DNA are made

(2)

(b) The mass of DNA in a human body cell at the start of the cell cycle is 6 picograms.

What mass of DNA will be in each of the new cells produced by this cell division?

Tick **one** box.

- 3 picograms
- 6 picograms

9 picograms

12 picograms

(1)

(c) Stem cells are undifferentiated cells.

Which statement about stem cells is correct?

Tick **one** box.

Animal stem cells are found in meristems

Animal stem cells divide by meiosis

Meristem cells in plants can differentiate throughout the life of the plant

Meristem cells in plants can only differentiate into one type of cell

(1)

Stem cells from human embryos can differentiate into most types of human cell.

Research is being done into the use of embryonic stem cells in medical treatments.

The long-term effects of using embryonic stem cells in patients are not well understood.

In therapeutic cloning, human embryos are produced using a donated human egg cell and a cell from the patient.

- The embryo produced contains the same genetic information as the patient.
- Stem cells are taken from the embryo and stimulated to divide to form cells the patient needs.
- The embryo is then destroyed.

(d) Suggest **two** advantages of therapeutic cloning.

1. _____

2. _____

(2)

(e) Suggest **two** disadvantages of therapeutic cloning.

1. _____

2. _____

(2)
(Total 8 marks)

Mark schemes

Q1.

- (a) (i) follicle stimulating hormone / FSH 1
- (ii) oestrogen 1
- (b) (i) any **one** from:
- to help them have a baby / get pregnant
ignore to make them fertile
 - to stimulate egg production / release / maturation
 - own levels of FSH / LH / hormone (too) low
allow to increase hormone / FSH / LH levels
do not allow to increase oestrogen levels
- (ii) through the bloodstream 1
- (c) oestrogen 1
- progesterone 1
- [6]**

Q2.

- (a) hold a ruler (just) above the (open) hand of the other student
ignore near the hand 1
- drop the ruler and other student catches it
do not accept give verbal signal 1
- record where the ruler is caught
ignore timing 1
- (b) 193.5 1
- (c) to compare the effect of no caffeine
allow as a control (group)
allow to show the effect of caffeine 1
- do not accept control variable*
- (d) 0.217 (s)
allow any value in the range 0.2150 to 0.2180 1
- (e) as mass of caffeine increases the decrease / change in reaction time

increases

allow converse

ignore caffeine decreases reaction time

*do **not** accept the greater the increase in reaction time the greater the mass of caffeine*

1

(f) their reaction time was greater (after the drink)

allow converse

allow slower / longer for greater

*do **not** accept anomalous result*

1

(g) 0.01(0) to 0.18(0)

or

0.18(0) to 0.01(0)

allow values in range 0.008 to 0.012

and

0.178 to 0.182

or

0.17(0)

allow correct calculation from values in range

if no values are given, allow answers in the range 0.166 to 0.174

allow $0.01 \leq C \leq 0.18$

ignore units

1

(h) any **two** from:

- (same range of) age
- (same) sex / gender
- (same) height / weight / BMI
- all had no caffeine / medication / drugs earlier that day
- equally tired or (same) amount of sleep
- practice of the ruler drop test
- starting point of ruler / hand
- *allow height ruler dropped from*
- same point to take measurement above / below the thumb / finger
- using the same hand
- (same) number of students in each group

*do **not** accept volume / concentration of caffeine*

2

(i) not automatic

allow it is a voluntary action

1

(because) it involves the (conscious part of the) brain

allow because it involves thinking / decision or conscious

action

1

[13]

Q3.

(a) Relevant organelle found in cells such as nucleus, mitochondria

1

(b) Linnaeus

1

(c) Kingdom

1

(d) *Homo Sapiens*

ignore underlining, italics or not, capitals or not

1

(e) Any **one** from:

- to know which species are closely related
- **or**
- study evolution
- to monitor biodiversity
- to identify different organisms such as two different species

1

[5]

Q4.

(a) methane

allow CH₄ or water (vapour) or H₂O

allow correct example such as CFCs, nitrous oxide, ozone

1

(b)

ignore references to increased temperature and greenhouse gas / effect

any **two** from:

- ice caps melting
- rise in sea levels
- desertification
- extreme weather

allow storms or droughts or flooding

- change in species distribution
- change in migration patterns
- loss of biodiversity

allow some species become extinct / endangered

- coral bleaching
- crop failure **or** food insecurity
- loss of habitat qualified

allow correct examples such as polar bears losing ice

- (c) **Level 2:** Scientifically relevant facts, events or processes are identified and given in detail to form an accurate account.

4-6

Level 1: Facts, events or processes are identified and simply stated but their relevance is not clear.

1-3

No relevant content

0

Indicative content

Photosynthesis

- (carbon dioxide is) taken in through stomata / leaves
- (carbon dioxide is) used in photosynthesis
- to make glucose / carbohydrate
- (glucose used) to make other carbon compounds or named example such as proteins, lipids
- (glucose) stored as starch

Feeding

- plants are eaten / consumed by animals
- which use the carbon compounds to make other carbon compounds

Decay

- when plants / animals die they are decomposed / decayed
- by microorganisms
- which use the carbon compounds to make other carbon compounds

Respiration

- plants / animals / microorganisms respire
- (respiration) releases carbon dioxide back into the atmosphere

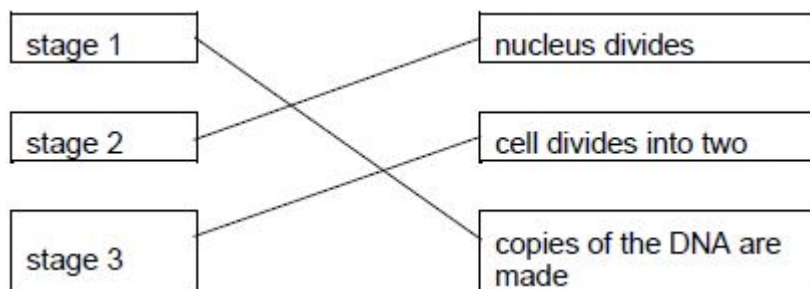
Level 2 answers must consider photosynthesis and at least one other process in the carbon cycle.

Level 2 answers must include some accurate detail.

[9]

Q5.

(a)



*allow 1 mark for 1 or 2 correct
credit can be given where students have
matched the boxes correctly, for example*

numbering the boxes

- 2
- (b) 6 picograms 1
- (c) meristem cells in plants can differentiate throughout the life of the plant 1
- (d) any **two** from:
- may cure / treat diseases
or
cure medical conditions
or
produce replacement cells / tissues / organs
allow example e.g. diabetes / paralysis
allow cells can be stored for future use
ignore used in medical treatments
ignore patient makes / grows cells / tissues / organs
 - cells unlikely to be **rejected** by patient)
ignore same genetic information
 - cells / tissues of any type can be produced
ignore differentiated into most types of cells
 - many cells produced
 - cells produced could be used for research
 - would reduce waiting time for transplants
- 2
- ignore references to cost*
ignore all reference to producing babies / IVF
- (e) any **two** from:
- (potential) life is killed / destroyed
allow embryo is killed
ignore embryo is destroyed
ignore embryo is a life / becomes a baby
 - shortage of donors / eggs
 - egg donation / collection has risks
 - do not yet know risks / side effects of the procedure on the patient
ignore long term effects are not well understood
allow may cause tumours / cancer
 - may transfer (viral) infection
 - poor success rate
allow in terms of viable egg / embryo / cell / tissue / organ production
- 2
- ignore references to cost*

ignore unethical unqualified
Ignore reference to religion / beliefs

[8]