

**Biology Paper 2:
Foundation**

Practice Questions - Set 2

Name: _____

Class: _____

Date: _____

Time: **41 minutes**

Marks: **40 marks**

Comments:

Q1.

Type 1 diabetes develops when the body does not produce enough insulin.

- (a) Which organ produces insulin?

(1)

- (b) One treatment for diabetes is to inject insulin.

The table gives the properties of four different types of insulin, **A**, **B**, **C** and **D**.

Type of insulin	Time taken for the insulin to begin to work in minutes	Time taken for insulin to reach maximum concentration in the blood in minutes	Time when insulin is no longer effective in hours
A	15-20	30-90	3-4
B	30-60	80-120	4-6
C	120-240	360-600	14-16
D	240-360	600-960	18-20

- (i) Some people with diabetes need to inject insulin just before a meal to stop a big increase in blood sugar concentration.

Which type of insulin, **A**, **B**, **C** or **D**, should these people with diabetes inject just before a meal?

Give the reason for your answer.

(2)

- (ii) A person with diabetes is told to inject type **B** insulin immediately after breakfast at 09.00.

The person with diabetes is told to then inject a second type of insulin at lunchtime at 12.00.

The second type of insulin should keep the blood sugar level under control for the rest of the 24 hours.

Which type of insulin, **A**, **C** or **D**, should this person with diabetes inject at lunchtime?

Give the reason for your answer.

(2)

- (iii) Apart from injecting insulin, give **one** other way in which Type 1 diabetes can be controlled.

(1)

(Total 6 marks)

Q2.

The human body produces many hormones.

- (a) (i) What is a *hormone*?

(1)

- (ii) Name an organ that produces a hormone.

(1)

- (iii) How are hormones transported to their target organs?

(1)

- (b) Describe how the hormones FSH, oestrogen and LH are involved in the control of the menstrual cycle.

(3)

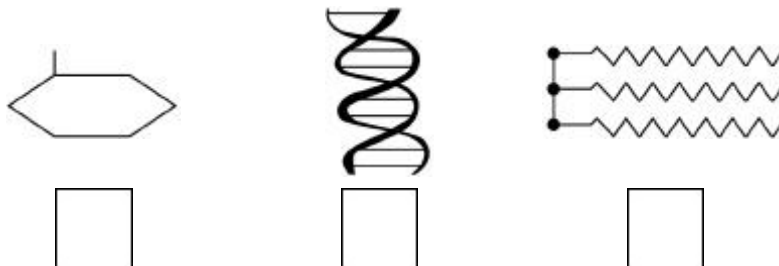
(Total 6 marks)

Q3.

This question is about DNA and genes.

(a) Which diagram represents a DNA molecule?

Tick (✓) **one** box.



(1)

(b) Describe the structure of a DNA molecule.

(1)

(c) A gene is a small section of DNA on a chromosome.

Complete the sentences.

A gene codes for a particular sequence of _____.

This sequence makes a specific _____.

(2)

(d) What is meant by the term genome?

(1)

(e) The complete human genome is now known.

Which important scientific advance was made using knowledge of the human genome?

Tick (✓) **one** box.

Discovering antibiotic resistant bacteria

Finding more foods to eat from tropical forests

Tracing how aboriginal people spread across Australia

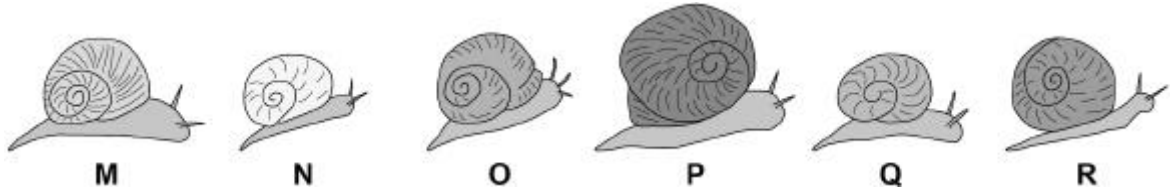
Working out when the last ice age ended



(1)

A student found six different snails of one species in his garden.

The diagram below shows the snails.



(f) All the snails are different.

What scientific term describes differences in characteristics between individuals of a species?

(1)

(g) A change in DNA has caused snail **P** to be very different from the other five snails.

Suggest why there might be an increasing number of snails similar to snail **P** in each future generation.

(2)

(Total 9 marks)

Q4.

Animals and plants are adapted in different ways in order to survive.

(a) Plants may have to compete with other plants.

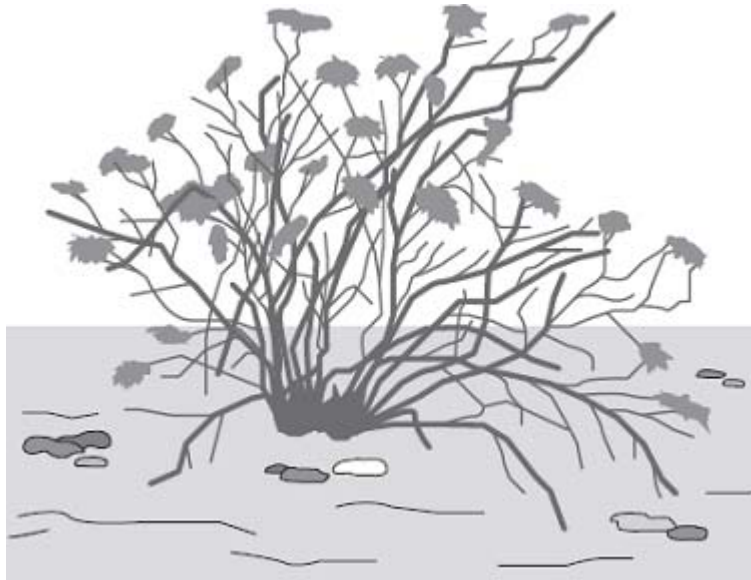
(i) Name **two** things for which plants compete.

1. _____

2. _____

(2)

(ii) The drawing shows a creosote bush.



This bush lives in a desert.

The creosote bush produces a poison that kills the roots of other plants.

How does this poison help the creosote bush to survive in the desert?

(1)

(b) The photograph shows an insect called a katydid.



By Ltshears (Own work) [Public domain], via Wikimedia Commons

The katydid is preyed on by birds.

How does the appearance of the katydid help it to survive?

(1)
(Total 4 marks)

Q5.

All living organisms are classified into groups.

Table 1 shows the classification of one species of wheat.

Table 1

Kingdom	Plant
Phylum	Angiosperms
Class	Monocotyledons
Order	Commelinids
Family	Poaceae
Genus	Triticum
Species	spelta

(a) What is the binomial name for the wheat in **Table 1**?

Tick **one** box.

Angiosperm monocotyledons

Poaceae triticum

Species spelta

Triticum spelta

(1)

Modern classification systems compare the similarity between the DNA of organisms.

The more similar the DNA code, the more closely the organisms are related.

Table 2 shows DNA codes in five different organisms.

Table 2

	DNA Codes										Number of differences in DNA code compared with the human sequence
Human	A	B	C	D	E	F	G	H	I		
Pig	J	F	C	D	E	F	G	H	I		
Wheat	C	I	K	D	M	F	G	H	I		
Yeast	C	I	K	D	L	M	G	H	I		5
Chicken	J	F	C	D	M	F	G	H	I		3



(b) Complete the final column of **Table 2** for Pig and for Wheat. (1)

(c) Which organism in **Table 2** appears to be most closely related to humans? (1)

(d) Give **one** reason why conclusions about the similarities between organisms should not be made using **only** the DNA codes in **Table 2**. (1)

Chickens can be bred either for meat or for laying eggs.

The diagram below gives some information about different types of chicken.

	Chicken bred for meat	Chicken bred for laying eggs
		
Average weight in kg	1.8	0.7
Average number of eggs laid per week	2	6

(e) Describe how selective breeding has been used to produce chickens bred for meat.

(3)

(f) Give **one** advantage of selective breeding to the farmer.

(1)

(g) Selective breeding can lead to disadvantages for the chickens.

What is a possible disadvantage of selective breeding for the chickens bred for meat in the diagram above?

Tick **one** box.

The chickens will be genetically identical

There will be less food to feed people

The chickens may weigh too much to be able to stand

The chickens will be kept in better conditions

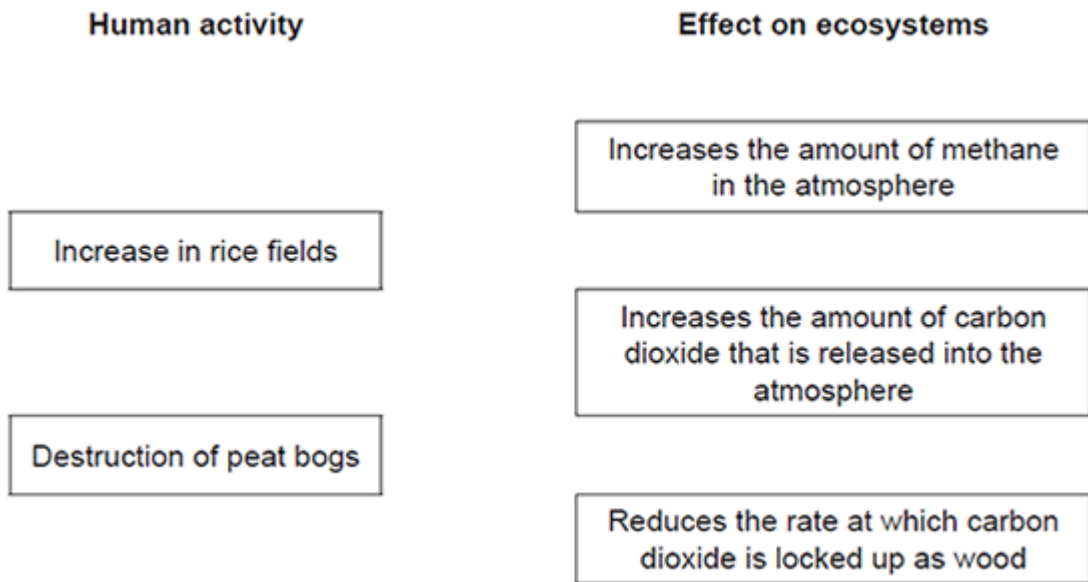
(1)

(Total 9 marks)

Q6.

Human activity affects ecosystems.

(a) Draw **one** line from each human activity to the effect on ecosystems.



(2)

(b) (i) Deforestation also affects the atmosphere.

Give **two** reasons why deforestation takes place.

1. _____

2. _____

(2)

(ii) Changes in the gases in our atmosphere can cause global warming.

Give **two** possible effects of a rise in the Earth's temperature.

1. _____

2. _____

(2)

(Total 6 marks)

Mark schemes

Q1.

(a) pancreas

allow phonetic spelling

1

(b) (i) A

1

shortest / quicker time (to work)

1

(ii) D

1

acts for longest time

mark dependent on D

allow D will last until 09.00 / breakfast / 24 hours

1

(iii) diet / exercise

*if 'diet' is qualified, then will need correct qualification, e.g.
'less carbohydrate / sugar'*

accept pancreas transplant / stem cell treatment

1

[6]

Q2.

(a) (i) any **one** from:

- chemical messenger / message

allow substance / material which is a messenger

- chemical / substance produced by a gland

allow material produced by a gland

- chemical / substance transported to / acting on a target organ

- chemical / substance that controls body functions

1

(ii) gland / named endocrine gland

brain alone is insufficient

allow phonetic spelling

1

(iii) in blood / plasma **or** circulatory system **or** bloodstream

accept blood vessels / named

*do **not** accept blood cells / named*

1

(b) *each hormone must be linked to correct action*

apply list principle
ignore the gland producing hormone

FSH stimulates oestrogen (production) / egg maturation / egg ripening
ignore production / development of egg

1

oestrogen inhibits FSH

allow oestrogen stimulates LH / build up of uterine lining

1

LH stimulates egg / ovum release / ovulation

accept LH inhibits oestrogen
accept LH controls / stimulates
growth of corpus luteum
ignore production of egg

1

[6]

Q3.

(a)



1

(b) any **one** from:

- 2 strands / chains that are twisted / coiled / spiralled
- double helix
- (long) polymer

allow cross links between 2 strands / chains
allow reference to nucleotides or sugars,
phosphates and bases

1

(c)

in this order only

amino acids

1

protein

allow polypeptide

1

(d) all the genetic material (of an organism)

allow DNA / genes for genetic material
ignore chromosomes

1

(e) tracing how aboriginal people spread across Australia

1

(f) variation

ignore genetic/environmental

1

(g) stronger / larger (shell)

1

(so) more likely to (survive and) breed

or

(so) more likely to (survive and) pass on genes

OR

(better) camouflaged (1)

(so) less likely to be eaten and will breed more (1)

1

[9]

Q4.

(a) (i) any **two** from:

ignore oxygen / food / sun / carbon dioxide

- light
 - water
 - space
 - nutrients / ions / minerals / named
- accept two named minerals / ions for 2 marks*

2

(ii) less competition for water

ignore space / light / food

or

more water / nutrients / minerals available

1

(b) camouflage / same shape as leaf / looks like a leaf

allow 'blends in'

ignore colour

1

[4]

Q5.

(a) *Triticum spelta*

1

(b) (pig) 2
and
(wheat) 4

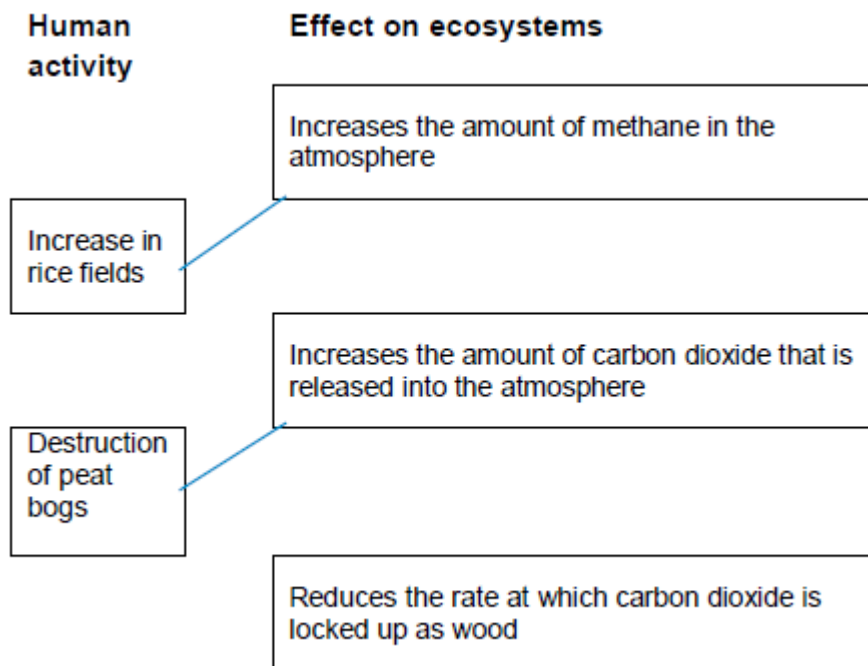
both needed for 1 mark

1

- (c) pig
allow ecf from part (b) 1
- (d) only a small sample (of DNA)
ignore references to structure and appearance 1
- (e) any **three** from:
 - (farmer) selects heaviest / largest chickens / parents
allow (farmer) selects chickens with the best / most meat
 - (cross) breeds these chickens together
 - (farmer) selects the heaviest / largest offspring (to breed)
 - repeats this many times (until you have the desired chicken)
 3
- (f) high(er) income / profit 1
- (g) the chickens may weigh too much to be able to stand 1

[9]

Q6.



- (a) *extra lines from left cancels mark* 2
- (b) (i) any **two** from:
 - (to provide land) for farming / agriculture
 - (to provide land) for quarrying
 - (to provide land) for building
 - to provide wood for building materials
 - to provide fuel

- to provide paper

2

(ii) any **two** from:

- changes in earth's climate, ie droughts, flooding, hurricanes
ignore temperature rise
allow ice caps melt
- rise in sea levels
- reduce biodiversity
- change in migration patterns
- may change distribution of species
*ignore acid rain **and** the ozone layer **and** forest fires*

2

[6]