PAPER 1 QUESTIONS (LIVE)

Lesson Description

In this lesson we:

- Work through selected examination questions adapted from 2014 Exemplar Paper covering:
  - The Human Nervous System
  - The Human Eye and Ear
  - The Endocrine system
  - Plant responses to the Environment
  - Human Impact on the Environment

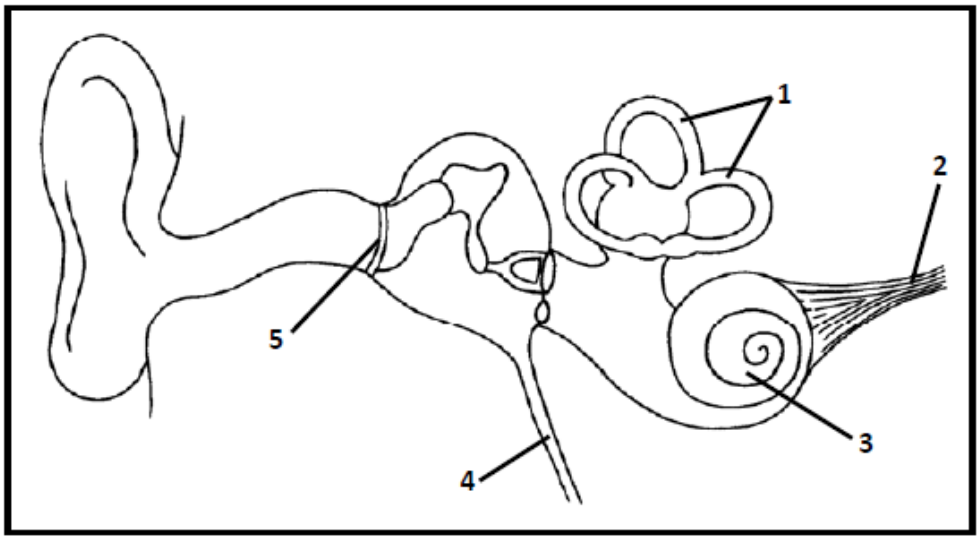
Improve your Skills

Question 1

(Adapted from DBE 2014 Exemplar P1, Question 1.1)

Select the most correct option and write down only the letter next to the number of the question.

Questions 1.1 and 1.2 refer to the diagram below showing the structure of the human ear.



1.1 Which part sends vibrations to the ossicles?

A 3
B 1
C 4
D 5

1.2 Which part maintains equal pressure on either side of the tympanic membrane?

A 4

B 3

C 2

D 1

1.3 The following are effects of the secretion of different hormones:

1. An increase in the blood glucose level
2. An increase in the heart rate
3. An increase in the amount of digestive enzymes
4. An increase in blood flow to the skeletal muscles

Which ONE of the following combinations of the above effects is due to adrenalin?

A 1, 3 and 4

B 2, 3 and 4

C 1, 2 and 4

D 1, 2, 3 and 4

1.4 The control centre in the body that will be activated when an athlete is dehydrated is the …

A cerebellum

B cerebrum.

C corpus callosum.

D pituitary gland.

Question 2

(Adapted from DBE 2014 Exemplar P1, Question 1.2)

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

2.1 The period of development of an embryo in the uterus between fertilisation and birth

2.2 Disease characterised by a lack of insulin production

2.3 Tube that connects the pharynx and the middle ear

2.4 A process by which nutrients become highly concentrated in a body of water, leading to increased growth of organisms such as algae

Question 3

(Adapted from DBE 2014 Exemplar P1, Question 1.3)

Indicate whether each of the statements in COLUMN I applies to A only, B only, both A and B or none of the items in COLUMN II. Write A only, B only, both A and B, or none next to the question number.

COLUMN I	COLUMN II
3.1 Type of development resulting in offspring that are capable of moving around soon after hatching	A Precocial B Altricial
3.2 Converts glucose to glycogen	A Glucagon B Adrenalin
3.3 Factors affecting water availability	A Destruction of wetlands B Poor farming practices
3.4 Provides greater chances for the fusion of sperm and egg	A External fertilisation B Internal fertilisation
3.5 Characteristic of vivipary	A Placenta is formed B Live offspring is born
3.6 Examples of greenhouse gases	A Carbon dioxide B Methane

Question 4

(Adapted from DBE 2014 Exemplar P1, Question 1.4)

Refer to the diagram on the next page which represents a portion of the central nervous system of humans.

Write down the LETTER ONLY of the part which:

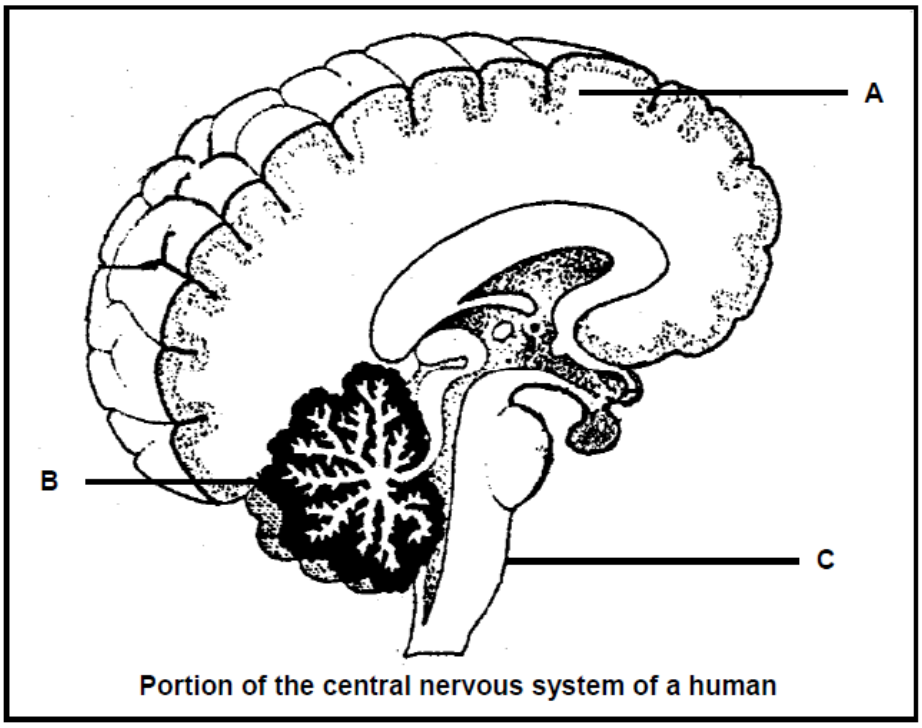
4.1 Regulates heartbeat and breathing rate

4.2 Coordinates movement while walking

4.3 Interprets what you see

4.4 Has its hemispheres connected by the corpus callosum

4.5 Controls balance and equilibrium

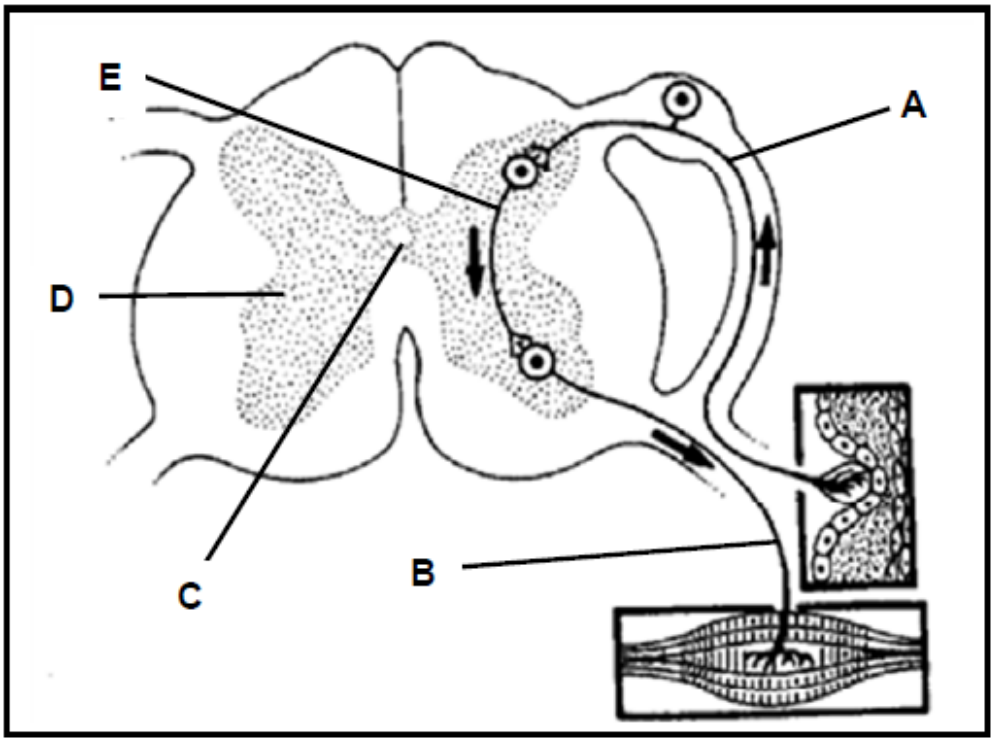


Portion of the central nervous system of a human

Question 5

(Adapted from DBE 2014 Exemplar P1, Question 2.1)

Study the diagram below, which shows a reflex arc.



5.1 Give labels for each of the following:

5.1.1 Region D

5.1.2 Neuron E

5.2 Write down the LETTER of the part which:

5.2.1 Transmits impulses to the central nervous system

5.2.2 Contains cerebrospinal fluid

5.3 Explain the effect on the reflex action if part B was damaged.

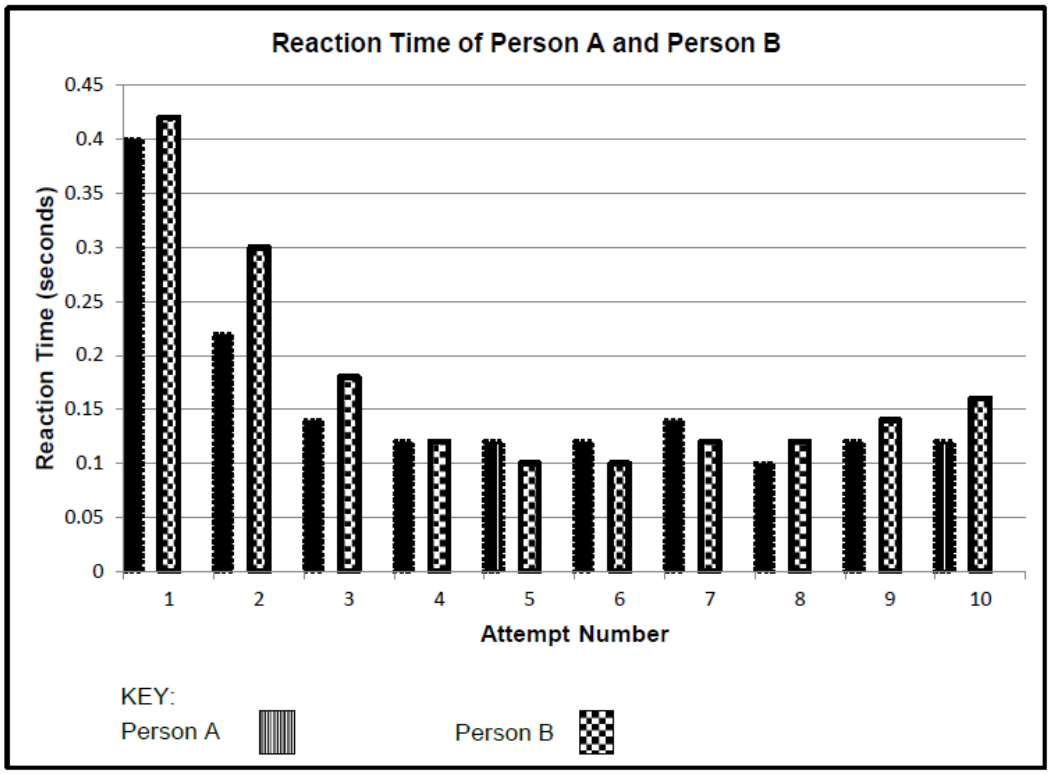
5.4 The nerve pathway in the above response is about 1,5 metres in length. A nerve impulse travels at 75 m s^{-1}. Use this information to calculate the time taken for this reflex action to occur. Show all working.

5.5 Explain the significance of a reflex action.

Question 6

(Adapted from DBE 2014 Exemplar P1, Question 2.2)

A learner carried out an investigation to measure the reaction time of two people (A and B). Each person had to ring a bell when a light flashed on. The time taken for each person to react was recorded and plotted on the bar graph below. The test was carried out 10 times.



6.1 What was the slowest reaction time?

6.2 Describe how the reaction time of Person B changed over the 10 attempts.

6.3 Suggest a possible reason for the trend described in QUESTION 6.2.

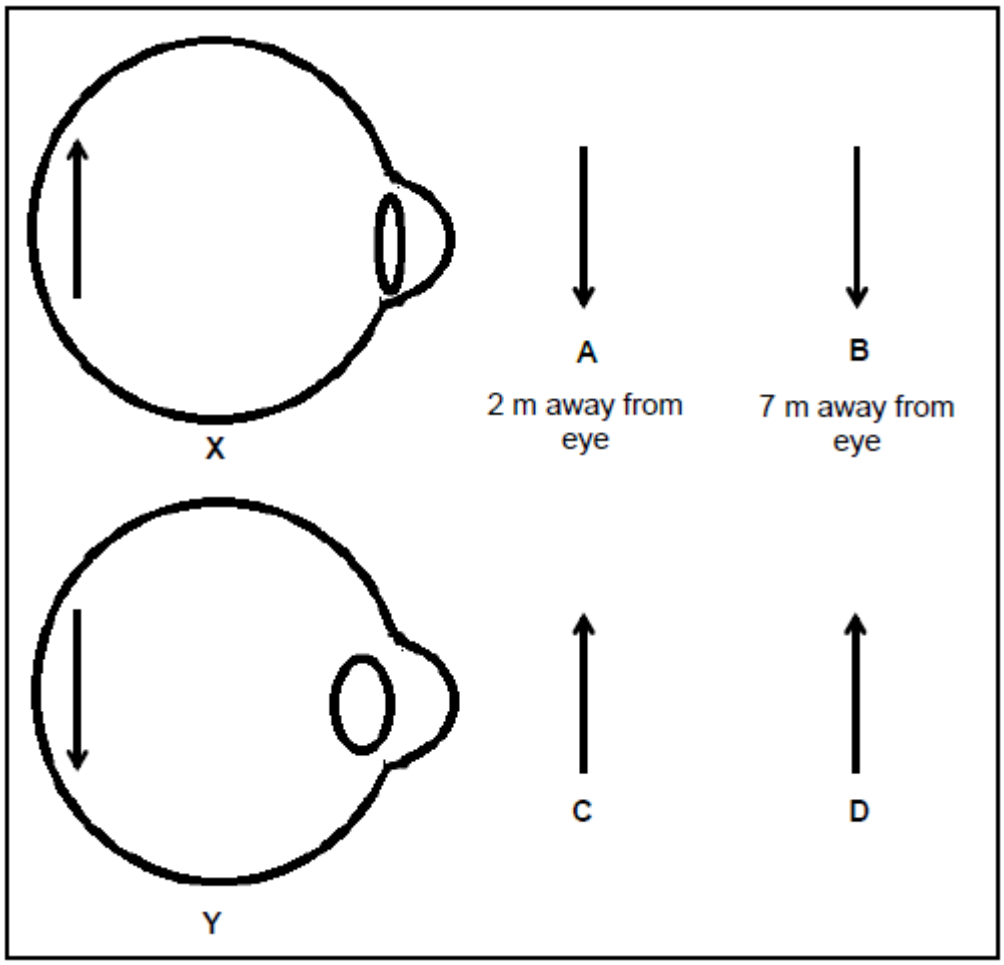
6.4 What was the stimulus in this investigation?

6.5 How would the reaction time of Person A have differed if he/she had been under the influence of drugs during the experiment?

Question 7

(Adapted from DBE 2014 Exemplar P1, Question 2.3)

The diagram shows two eyes (X and Y) focused on objects (represented by arrows) at different distances from the eye. Objects A and C were 2 metres away from the eye. Objects B and D were 7 metres away from the eye.



7.1 Write down the LETTER ONLY of the object that:

7.1.1 Eye X is focused on

7.1.2 Eye Y is focused on

7.2 Name and describe the process that allows eye Y to form a clear image on the retina.

Question 8

(Adapted from DBE 2014 Exemplar P1, Question 2.4)

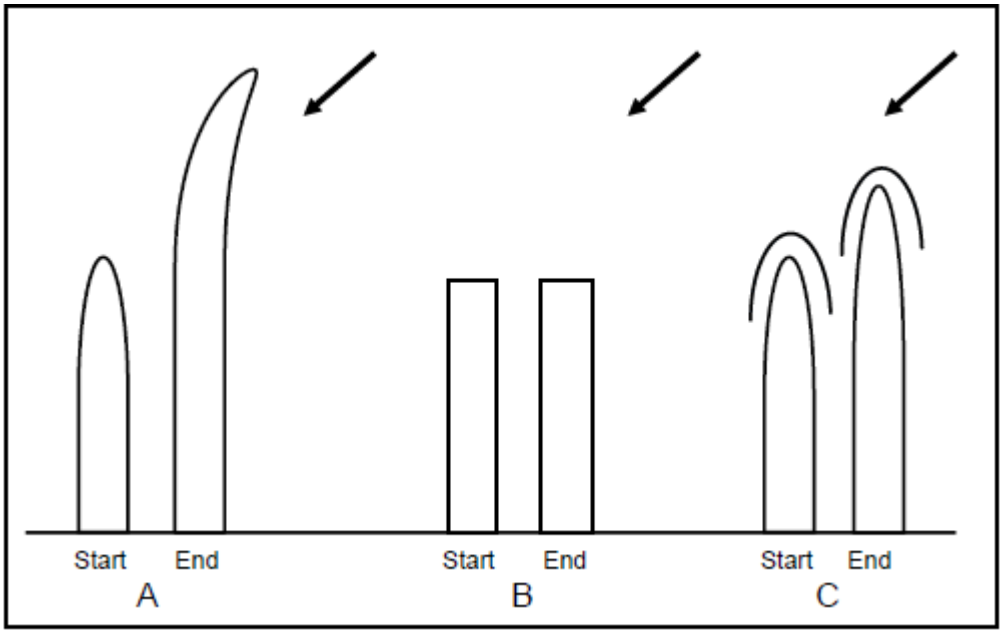
A Grade 12 learner performed an investigation to determine the effect of light on the growth of plant shoots. The learner divided the plants that were used into three groups as follows:

Group A – The tip of the shoot was intact.

Group B – The tip of the shoot was removed.

Group C – The tip of the shoot was covered by a cap that does not allow light to pass through.

The diagram below shows each shoot at the start of the investigation and next to each, the same shoot at the end of the investigation. The arrows indicate the direction of light in each investigation.



8.1 Name the dependent variable in this investigation.

8.2 State TWO factors that must be kept constant in this investigation.

8.3 The influence of which plant hormone is being investigated?

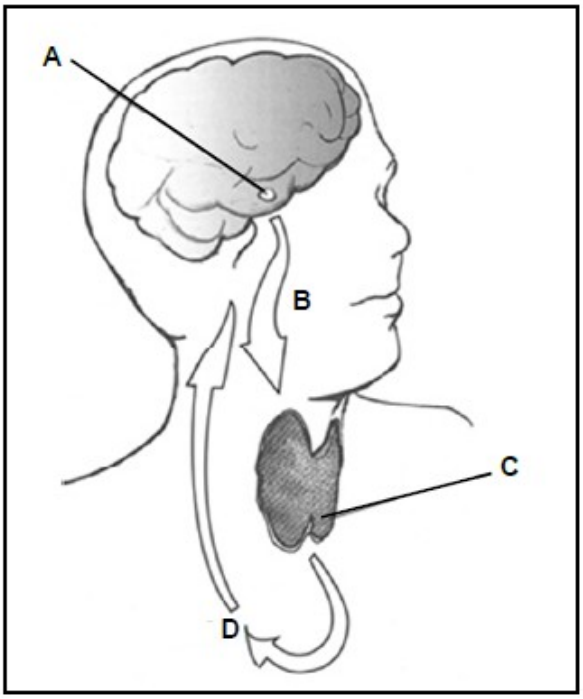
8.4 Explain the results observed in investigations A and C, as illustrated in the diagram above.

8.5 State TWO ways in which the learner could improve the reliability of this investigation.

Question 9

(Adapted from DBE 2014 Exemplar P1, Question 3.1)

The diagram below represents the interaction between two important endocrine glands. The gland labelled A is found at the base of the brain, while the gland labelled C is present towards the front of the neck.



9.1 Give a label for gland A.

9.2 Name hormone B.

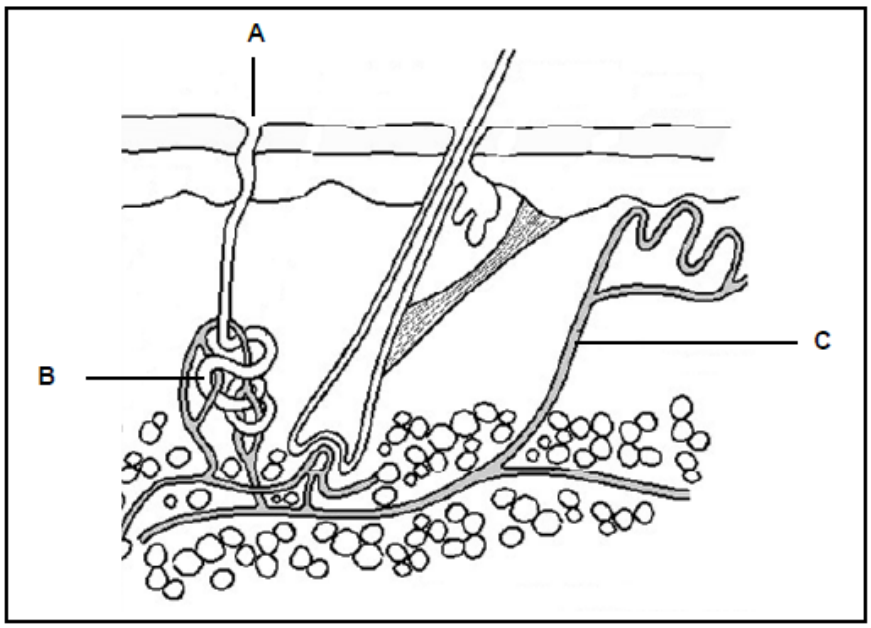
9.3 State TWO functions of hormone D.

9.4 Describe the negative feedback mechanism that operates when the level of hormone D is higher than normal in the blood.

Question 10

(Adapted from DBE 2014 Exemplar P1, Question 3.2)

The diagram below shows a section through the mammalian skin.



10.1 Give labels for parts A, B and C.

10.2 Describe how parts B and C play a role in reducing the body temperature back to normal when it increases above the normal level.

Question 11

(Adapted from DBE 2014 Exemplar P1, Question 3.3)

The Human Sciences Research Council (HSRC) conducted a survey on food security across the provinces. The results showed that the overall percentage of food-secure households in South Africa is 45,6% as opposed to 48% in 2008.

The results, indicating the percentage of food-insecure households in each province according to the latest survey, are shown in the table below.

PROVINCE	FOOD-INSECURE HOUSEHOLDS (%)
Eastern Cape	36
Limpopo	31
Mpumalanga	30
Free State	29
KwaZulu-Natal	28
Northern Cape	21
Gauteng	19
Western Cape	16

11.1 What is meant by food security?

11.2 Use the data in the table to draw a bar graph for the four provinces that have the highest percentage of food-insecure households.

11.3 State how the use of fertilisers by farmers can:

11.3.1 Increase food security for a country

11.3.2 Decrease food security for a country

11.4 State how the use of pesticides by farmers can:

11.4.1 Increase food security for a country

11.4.2 Decrease food security for a country

11.5 State TWO factors, other than the use of fertilisers and pesticides, which may have led to a decrease in the percentage of food-secure households in South Africa since 2008.

Question 12

(Adapted from DBE 2014 Exemplar P1, Question 3.4)

The carbon dioxide concentration in the atmosphere was recorded at 400 parts per million (ppm) in May 2013 compared to 316 parts per million (ppm) in 1958. This change is due to an increase in the use of fossil fuels as well as an increase in deforestation.

12.1 Describe how deforestation contributes to the high carbon dioxide concentration in the atmosphere.

12.2 State ONE other impact of deforestation on the environment.

12.3 Explain why we should be concerned about the rising carbon dioxide levels.

12.4 Suggest ONE way in which the government can reduce carbon emissions caused by the generation of electricity.

SOLUTIONS TO PAPER 1 QUESTIONS (LIVE)

Question 1

(Adapted from DBE 2014 Exemplar P1, Question 1.1)

1.1 D

1.2 A

1.3 A

1.4 C

Question 2

(Adapted from DBE 2014 Exemplar P1, Question 1.2)

2.1 Gestation

2.2 Diabetes mellitus

2.3 Eustachian tube

2.4 Eutrophication

Question 3

(Adapted from DBE 2014 Exemplar P1, Question 1.3)

3.1 A only

3.2 None

3.3 Both A and B

3.4 B only

3.5 Both A and B

3.6 Both A and B

Question 4

(Adapted from DBE 2014 Exemplar P1, Question 1.4)

4.1 C

4.2 B

4.3 A

4.4 A

4.5 B

Question 5

(Adapted from DBE 2014 Exemplar P1, Question 2.1)

5.1.1 (a) Grey matter

(b) Interneuron/connector neuron

5.1.2 (a) A

(b) C

5.3 Sensation would be felt but there would be no response

5.4 1,5 m ÷ 75 $m.s^{-1}$

= 0,02 s

5.5 Helps to protect the body by reacting quickly

Question 6

(Adapted from DBE 2014 Exemplar P1, Question 2.2)

6.1 0,42 seconds

6.2 − It decreased first

− then levelled off

− and finally increased again.

6.3 Practice makes reaction time faster but later, tiredness slows down the reaction time.

6.4 Light

6.5 Reaction time would probably increase

Question 7

(Adapted from DBE 2014 Exemplar P1, Question 2.3)

7.1.1 (a) B

(b) C

7.2 Accommodation

− Ciliary muscles contract

− Suspensory ligaments slacken

− Tension on lens decreases

− Lens becomes more convex

− Refractive power of lens increases

− A clear image now forms on the retina

Question 8

(Adapted from DBE 2014 Exemplar P1, Question 2.4)

8.1 Growth of plant shoots

8.2 − Same environment in which the shoots are placed

− Same type of shoot used

8.3 Auxins

8.4 **In investigation A:**

− Light from the right

− caused auxins to move to shaded side of the shoot

− leading to increased cell elongation and division

− There was therefore greater growth on the shaded side
− thus bending the shoot in the direction of the source of light

In investigation C:

− Light has no influence on the distribution of auxins
− therefore the shoot grew upright

8.5 − Repeat the investigation
− Use more than one plant for each treatment

Question 9

(Adapted from DBE 2014 Exemplar P1, Question 3.1)

9.1 Pituitary gland/hypophysis

9.2 B – TSH/thyroid-stimulating hormone

9.3 − Controls metabolism
− Influences heart rate
− Influences functioning of central nervous system

9.4 − High levels of thyroxin is detected by the hypophysis
− which leads to a decrease
− in the secretion of TSH
− Activity of thyroid is slowed down /less thyroxin produced
− Thyroxin level drops to normal

Question 10

(Adapted from DBE 2014 Exemplar P1, Question 3.2)

10.1 A – Sweat pore
B – Sweat gland
C – Blood vessel

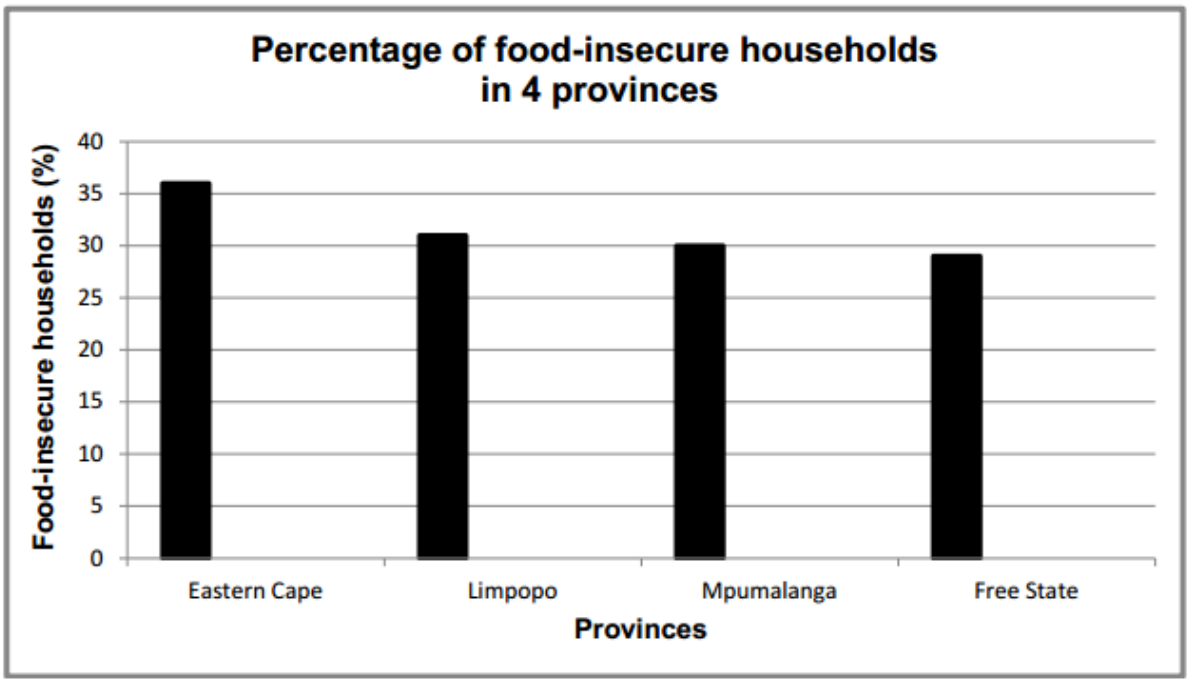
10.2 − Impulses sent from hypothalamus to C (blood vessels)
− Blood vessels dilate /vasodilation occurs
− More blood carrying heat comes to the skin surface
− and therefore more heat is lost from the body
− B (Sweat glands) produce more sweat
− When sweat evaporates from the skin surface
− More heat is lost from the skin
− leading to a drop in the body temperature

Question 11

(Adapted from DBE 2014 Exemplar P1, Question 3.3)

11.1 Having access to enough food on a daily basis, so as to ensure healthy living

11.2



11.3.1 Fertilisers provide nutrients that increase crop growth

11.3.2 Fertilisers are expensive – causes food prices to increase/ over-use of fertilisers can cause oxygen deprivation in soil which will eventually reduce crop production

11.4.1 Pesticides ensure that pests do not cause large-scale damage to crops

11.4.2 Pesticides could kill pests as well as their predators – hence more pesticides would have to be used, raising the cost of food

11.5
- Massive unemployment in the country
- Increase in the size of the human population
- Farms destroyed for development
- Decrease in subsistence farming
- Prolonged unfavourable environmental conditions

Question 12

(Adapted from DBE 2014 Exemplar P1, Question 3.4)

12.1 − There will be less trees

− so less carbon dioxide will be used from the atmosphere for photosynthesis

12.2 − Can lead to the loss of biodiversity/habitat destruction/soil erosion

12.3 − Increased carbon dioxide levels lead to the enhanced greenhouse effect

− which causes an increase in the global temperatures

− This could lead to rise in sea levels because of melting ice/ floods/change in climate

− which can lead to the extinction of some organisms.

12.4 Use alternate sources of energy