

PRELIM PAPER 1 QUESTIONS

15 OCTOBER 2014



Lesson Description

In this lesson we:

- Revise various questions related to topics in tested in the various Preparatory Exams in Paper 1



Test Yourself

Select the most correct answer from the options given. Write down only the correct letter

Question 1

Food security is NOT threatened by ...

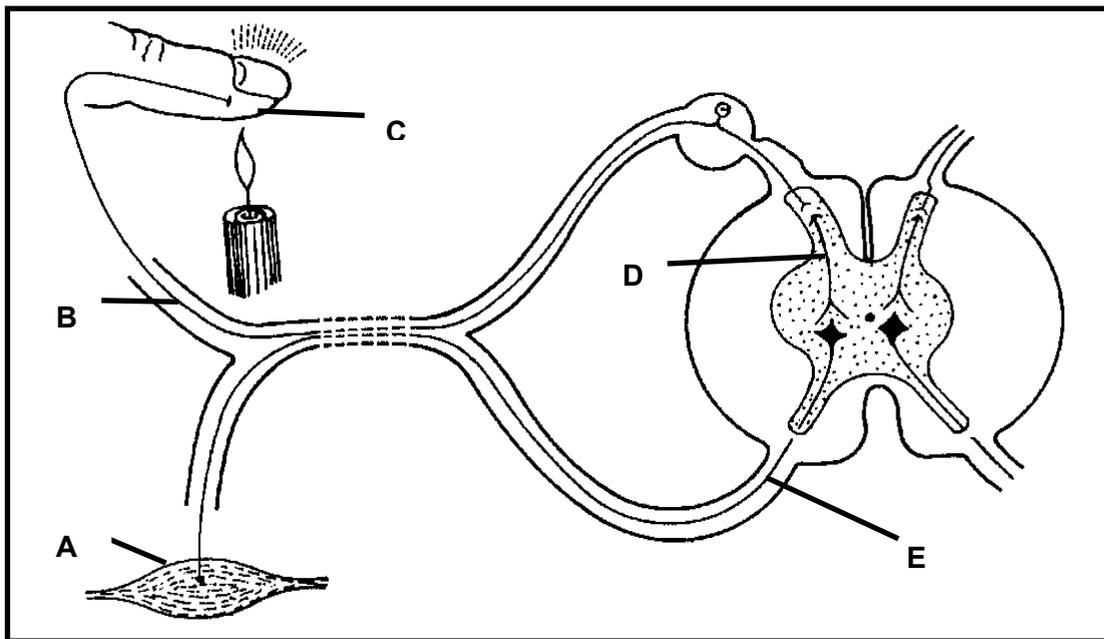
- A human exponential population growth.
- B wastage.
- C climate change.
- D birth control.

Question 2

Which ONE of the following combinations contains a factor that increases the greenhouse effect and a consequence of it respectively?

	Factor contributing to increases in the greenhouse effect	Consequence of the increased greenhouse effect
A	Increasing global temperatures	Rising sea levels
B	Rising sea levels	Increasing global temperatures
C	Increasing global temperatures	Burning fossil fuels to run air conditioning
D	Increasing global temperatures	Increases in air travel

Questions 3 and 4 are based on the following diagram.



Question 3

Which of the following regarding part **E** is CORRECT?

- A It transfers impulses to receptors.
- B It transfers impulses to effectors.
- C It transfers impulses from receptors.
- D It transfers impulses from effectors.

Question 4

The correct sequence in which impulses move from the receptor to the effector in the reflex arc above, is ...

- A A → B → C → E → D
- B C → A → B → D → E
- C C → B → D → E → A
- D A → E → D → B → C

Question 5

Ovovipary and vivipary are similar in that ...

- A internal fertilisation is a pre-requisite for both.
- B external fertilisation is a pre-requisite for both.
- C in both cases the egg is protected by a shell.
- D in both cases the egg has no covering.

Question 6

Menstruation starts when the production of ...

- A progesterone is at its maximum.
- B oestrogen is at its maximum.
- C oestrogen and progesterone decreases.
- D luteinising hormone is at its maximum.

Question 7

In an amniotic egg, the role of the allantois is to ...

- A produce oxygen for the growing embryo.
- B store waste products produced by the embryo.
- C serve as food for the embryo.
- D act as a shock absorber to prevent possible mechanical damage.

Question 8

The following statements describe the functions of placenta:

- (i) Serves as an attachment of the embryo to the mother
- (ii) Allows for the diffusion of dissolved nutrients from the mother to the foetus
- (iii) Allows for the diffusion of excretory wastes from the mother to the foetus
- (iv) Allows for the diffusion of oxygen from the mother to the foetus

Which ONE of the following combinations correctly describe the functions of placenta?

- A (i), (ii), and (iii)
- B (ii) only
- C (i), (ii) and (iv)
- D (ii) and (iii)

Question 9

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
1	The development in birds where the hatchlings can move soon after being born	A: Ovoviviparity B: Altricial
2	Having access to food, on a regular basis, so as to ensure healthy living	A: Water availability B: Food security
3	The cells that secretes testosterone in males	A: Cells of Sertoli B: Stem cells
4.	The removal of trees and other plants	A: Aforestation B: Deforestation
5.	A visual defect that can be corrected with biconcave lenses	A: Myopia B: Hypermetropia

Question 10

Give the correct **biological term** for each of the following descriptions. Write only the **term** next to the relevant question number.

1. Growth movements of parts of plants in response to gravity
2. The first bone in the middle ear of humans
3. The blood vessel that carries oxygenated blood to the foetus
4. A disorder that occurs when one's own immune system surrounds, attacks and destroys the myelin sheath that envelops the axons
5. The receptor in the ear that converts vibrations into a nervous impulse
6. Manufacturing products from waste materials
7. The membrane that forms finger-like projections which grows into the uterine wall
8. A layer of gas in the stratosphere which absorbs harmful UV rays
9. Type of reproduction where the foetus develops inside the mother's uterus
10. Organisms that occupy an area they do not normally inhabit and where they outcompete the natural species of that area

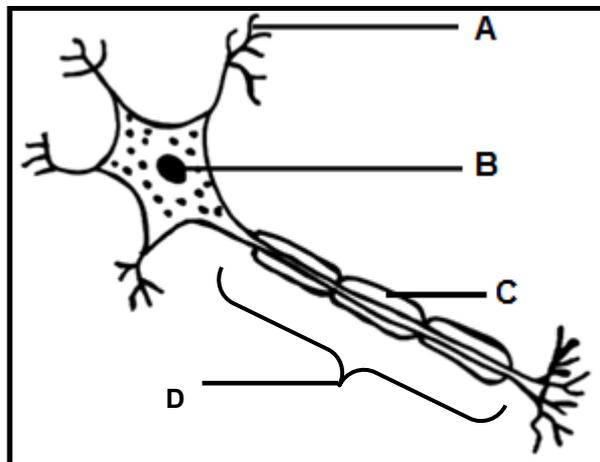


Improve your Skills

Question 1

(Adapted from paper 1 Gauteng prep 2014)

Study the diagram illustrating a neuron and answer the questions that follow.



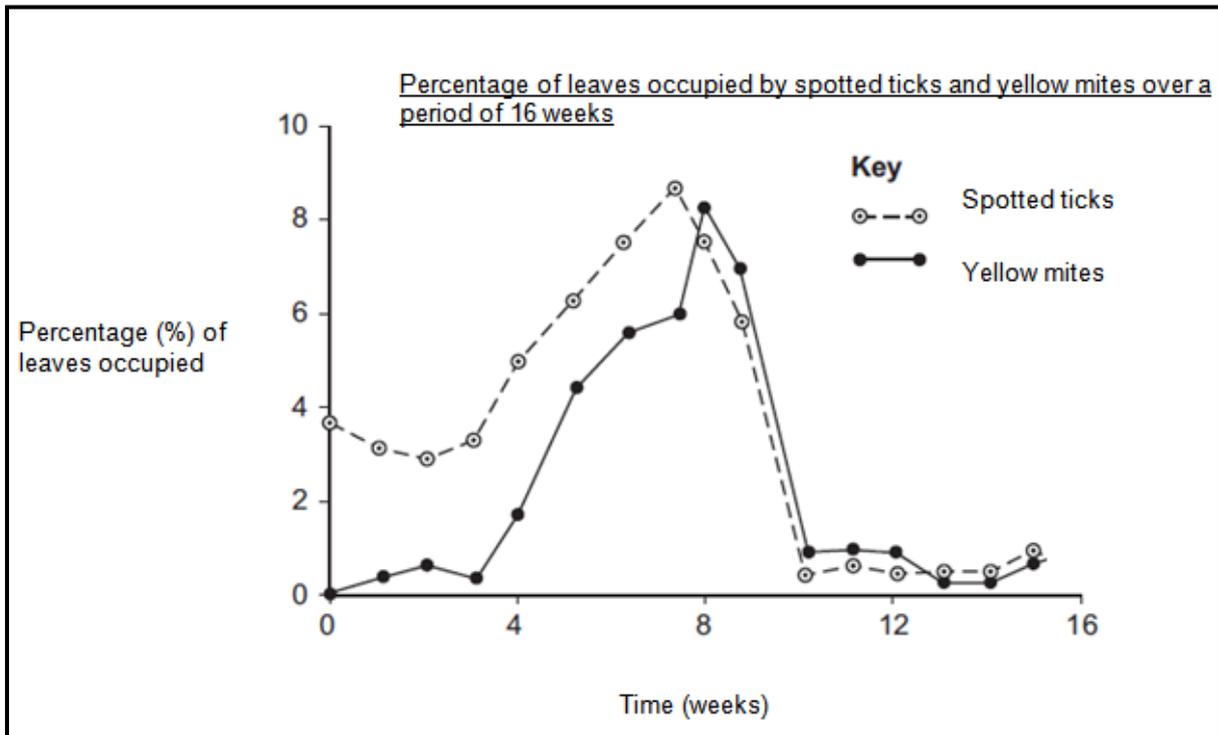
- 1.1 What type of neuron is represented here? (1)
- 1.2 Provide labels for structures A, B and D. (3)
- 1.3 Provide the LETTER and NAME of the structure that :
 - (a) transmits the impulse to the cell body.
 - (b) transmits the impulse away from the cell body
 - (c) degenerates when a person has multiple sclerosis (6)

Question 2

(Adapted P1 Gauteng Prep 2014)

Spotted ticks are pests of strawberry plants. Yellow mites feed on the spotted ticks. Ecologists investigated the use of yellow mites to control the spotted tick population.

- They released yellow mites on strawberry plants infested with the spotted ticks
- They then recorded the percentage of strawberry leaves occupied by the spotted ticks and by yellow mites over a 16-week period.
- The results are shown on the graph below.



- 2.1 Name the method of controlling pests used in this investigation. (1)
- 2.2 Give TWO advantages of using the method of pest control mentioned in Question 1 above. (2)
- 2.3 Identify the dependent variable in this investigation. (1)
- 2.4 What is the percentage of leaves occupied by the spotted ticks at two weeks? (2)
- 2.5 Describe how the percentage of leaves occupied by yellow mites changed between weeks 3 and 12 of this investigation. (3)
- 2.6 The ecologists concluded that the method of pest control used in this investigation was effective. Explain how the results support this conclusion. (2)
- 2.7 Suggest TWO reasons why farmers who grow strawberry plants and read about this investigation might decide not to use these yellow mites. (2)

Question 3

(Adapted from paper 1 exemplar 2014)

The cartoon below shows the plight of the rhinoceros population in South Africa. Study the cartoon and answer the questions that follow.



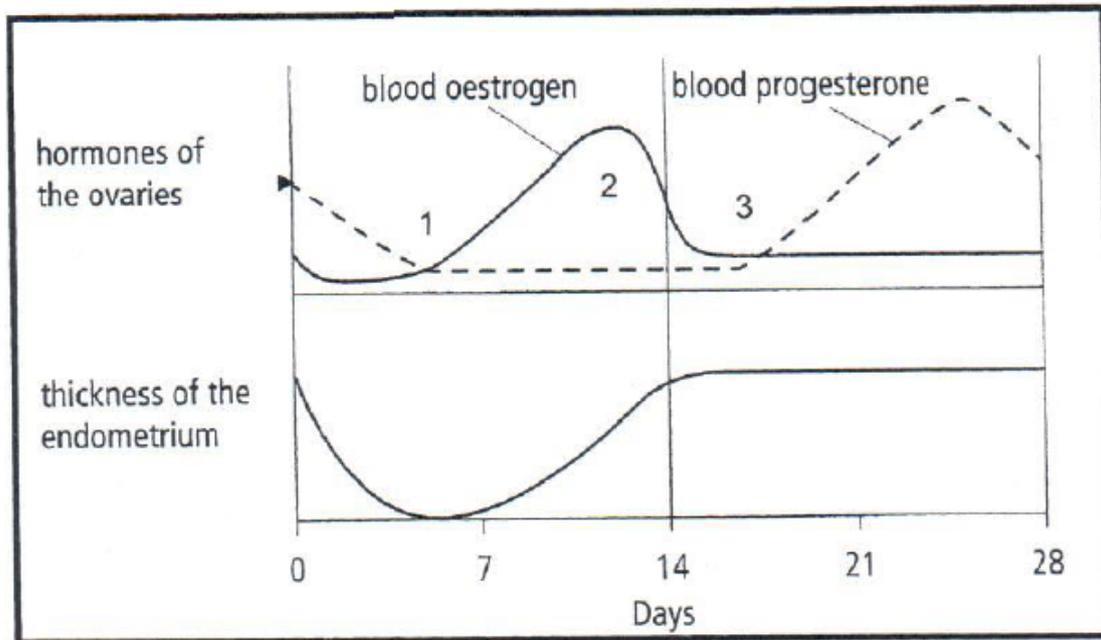
[Mark Wiggett's cartoon published in *The Herald Newspaper*. 25/09/2012]

- 3.1 What is the main cause of a drastic decrease of the rhinoceros population in South Africa? (1)
- 3.2 Explain the future chances of survival of the rhinoceros population in South Africa as depicted in the above cartoon. (3)
- 3.3 Which body part of rhinoceros is targeted by the criminals? (1)
- 3.4 Suggest TWO ways to stop rhinoceros population being killed in South Africa. (2)

Question 4

(Adapted from Prep P1 Limpopo 2014)

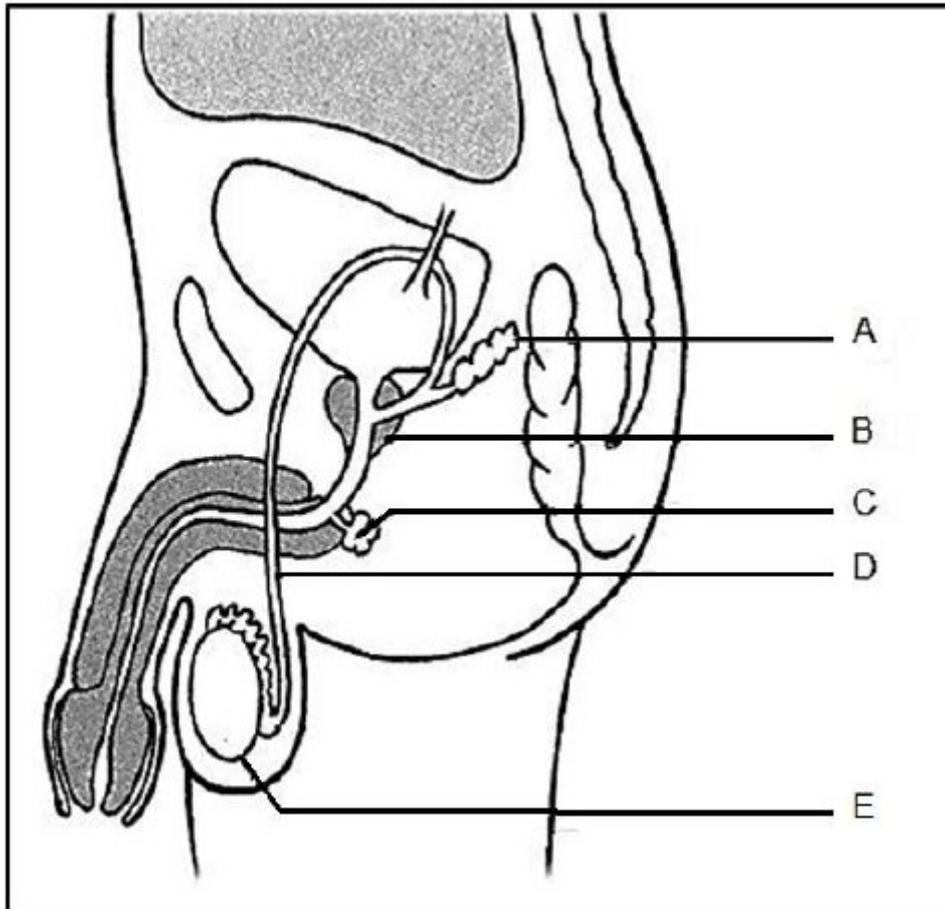
- 4.1 The graph below shows the approximate concentration of progesterone and oestrogen in the blood of a mature woman and the thickening of the endometrium over a 28-day period. Use the graph to answer the following questions.



- 4.1.1 From the graph, give the cause of the monthly bleeding known as menstruation. (2)
- 4.1.2 Predict how these cycles are going to be influenced if a woman only has one ovary. (2)
- 4.1.3 Differentiate between the various stages of development of the follicles at numbers 1 and 2 on the graph respectively, by giving their names and functions. (4)
- 4.1.4 Discuss the importance of the ovarian and uterine cycles synchronised exactly for fertilization and implantation to take place. (4)
- 4.1.5 Explain why, if the corpus luteum remains after fertilization has occurred, no new follicles will be produced. (4)

notes for...

4.2 The diagram below shows the structure of a male reproductive system of human. Study the diagram and answer the questions that follow.



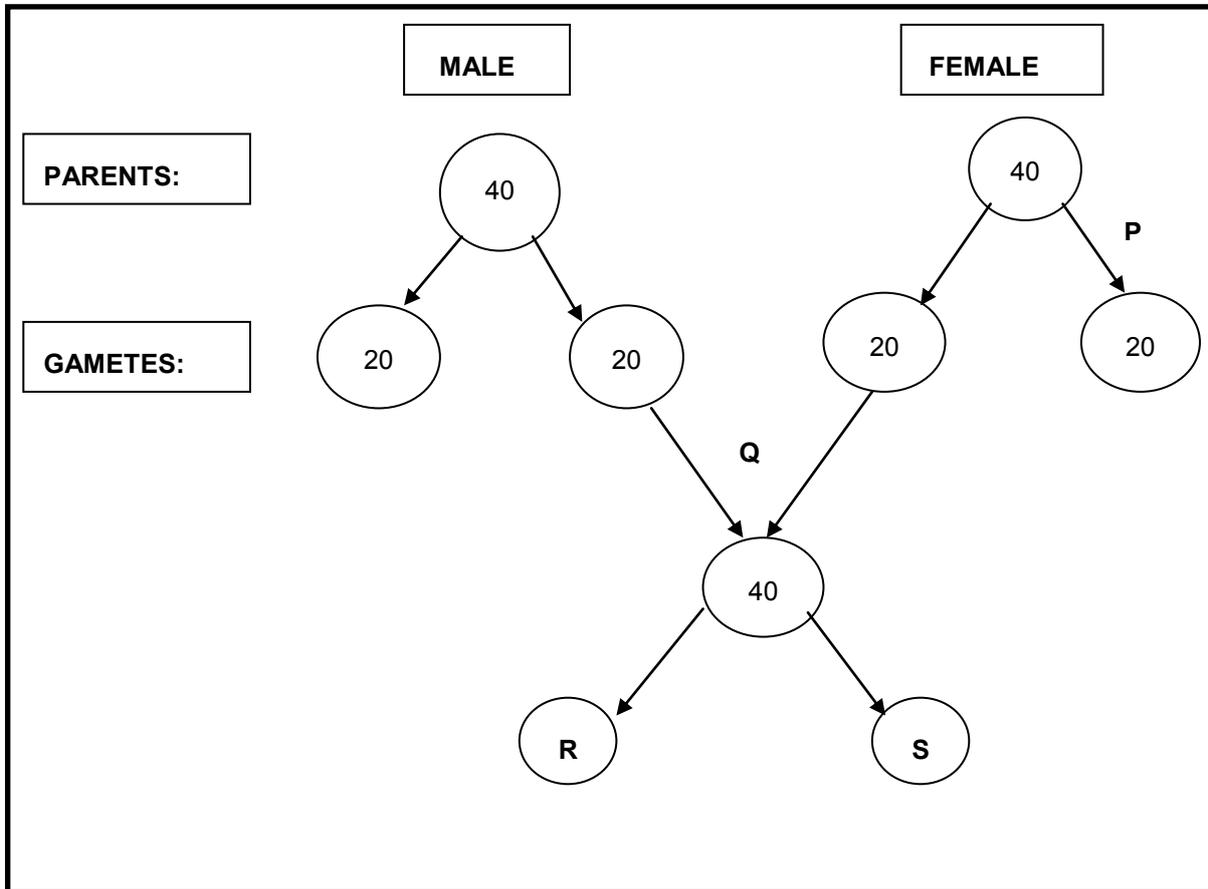
- 4.2.1 Give labels for A and C. (2)
- 4.2.2 State ONE function of the secretion from part labelled B. (1)
- 4.2.3 State the letter of the part that:
- (a) Transports sperms from the epididymis (1)
 - (b) Produces male hormone (1)
- 4.2.4 Name the structure where meiosis takes place. (1)

Question 5

(Adapted from paper 1 prep Gauteng 2014)

The following diagram represents the stages in the life cycle of a mammal.

5.1 The numbers of chromosomes in cells at different stages in the life cycle are shown. Study the diagram and answer the questions that follow.



- 5.1.1 Identify the type of cell division represented by P in the diagram. (1)
- 5.1.2 Name the process represented by Q in the diagram. (1)
- 5.1.3 How many autosomes would usually be present in one of the male gametes in this mammal? (1)
- 5.1.4 During gamete formation, homologous chromosomes pair up and exchange genetic material. Name this process where there is exchange of genetic material and explain its significance in gametogenesis. (3)
- 5.1.5 Draw and label a homologous pair of chromosomes, showing the process mentioned in Question 5.4. (HINT: The chromosomes are similar to that of humans) (5)
- 5.1.6 Provide the number of chromosomes found in the cell labelled R that is produced during growth. (1)
- 5.1.7 Name and describe the phase that leads to the chromosome number changing from the parent cells to the gametes. (3)

- 5.2 The photograph shown below was taken while a person was chased by a hippopotamus in the wild. Study the photograph and answer the following questions.



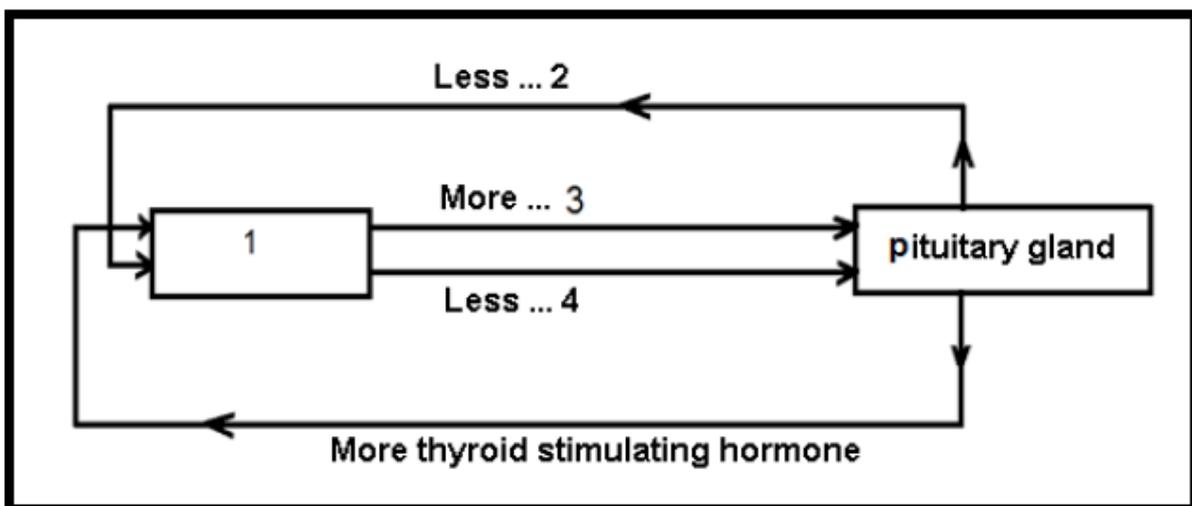
[www.dailymail.co.uk/news/article-1208479. Saturday, 19 October, 2013]

- 5.2.1 Name the hormone released by the person, to deal with the dangerous situation shown in the above photograph. (1)
- 5.2.2 Which gland in the human body is responsible for the secretion of the hormone mentioned in the QUESTION 5.2.1? (1)
- 5.2.3 State whether the gland mentioned in QUESTION 5.2.2 is an exocrine or endocrine gland. (1)
- 5.2.4 Explain any TWO effects of the hormone named in QUESTION 5.2.1 above. (4)

Question 6

(Adapted from Eastern Cape Prep 2014)

The diagram below illustrates the homeostatic control of the pituitary gland (hypophysis) over the functioning of another endocrine gland in the human body. Study the diagram and answer the questions that follow.



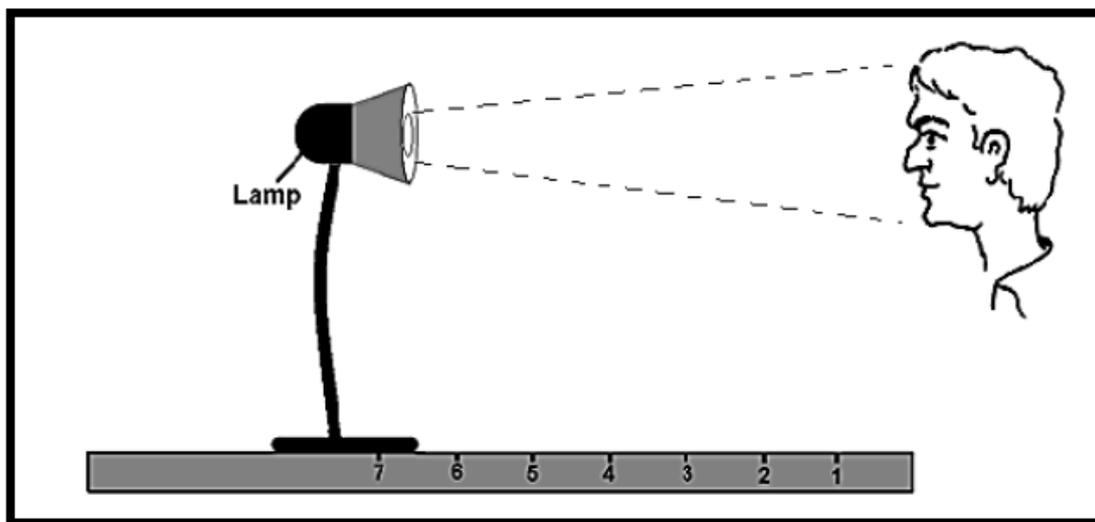
- 6.1 By which mechanism is homeostatic control achieved in the above process? (1)

- 6.2 Give labels for the following:
- Gland labelled 1
 - Hormone labelled 2
 - Hormone labelled 3
 - Hormone labelled 4
- 6.3 Name the nutrient required for the proper functioning of part labelled 1. (1)
- 6.4 Which physiological defect can be attributed to the absence of the mineral mentioned in QUESTION 6.3 in our daily diet? (1)

Question 7

(Adapted from Prep 1 Eastern Cape 2014)

An experiment was conducted to investigate the diameter of the pupil to change in light intensity. An electric lamp was placed at various distances from the face of a person as displayed in the diagram below. Study the diagram and the table of data below to answer the questions.



- 7.1 Suggest a possible hypothesis at the start of the investigation. (2)
- 7.2 Which TWO factors should be kept constant during this investigation? (2)
- 7.3 Identify the:
- independent factor (1)
 - dependent factor (1)

The table below shows the diameter of the pupil when the light was placed at various distances from the person's face.

Position of the lamp	Diameter of the pupil (mm)
1	1,2
2	1,8
3	2,4
4	3,0
5	3,6
6	4,2
7	4,8

- 7.4 Based on the available data would you accept, or reject the initial hypothesis? (1)
- 7.5 What conclusion can be deduced from the available data? (2)

- 7.6 Suppose the lamp was moved from position 7 to position 2. Describe the mechanism that caused the change in the diameter of the pupil. (4)
- 7.7 Name the process mentioned in QUESTION 7.6. (1)
- 7.8 Plot a bar graph to represent the data gathered during this investigation. (8)

Question 8

(Adapted from Prep 1 eastern Cape 2014)

Describe the role of the ear in hearing and the maintenance of balance.

Question 9

(Adapted from Prep 1 Gauteng 2014)

“Homeostasis is the maintenance of a constant internal environment, within narrow limits, despite a changing external environment.”

Nomsa is sitting in class on a particular day and looks at the wall thermometer. What she sees is shown in the diagram of part of the thermometer below.

Discuss the processes and mechanisms that are involved in thermoregulation and osmoregulation in her body on that particular day.

Content: (17)

Synthesis: (3)