PEARSON EDEXCEL GCSE BIOLOGY (HIGHER) · 1BI0

BIOLOGY



EXAM QUESTION PACK

TOPIC 7: ANIMAL COORDINATION, CONTROL AND HOMEOSTASIS (PACK 3)

SCORE	PERCENTAGE
/96	%

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Q1.

Hormones can also be used to treat infertility.

Explain how clomifene therapy and IVF can improve female fertility.

(4)

clomifene therapy .....

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IVF .....

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(Total for question = 4 marks)

Q2.

*Explain how hormones control the menstrual cycle.

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(Total for question = 6 marks)

Q3.

Explain how negative feedback, involving the thyroid gland, controls metabolic rate.

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(Total for question = 4 marks)

Q4.

*The nephrons in the kidney remove unwanted substances from the blood.

Figure 16 shows the structure of a nephron.

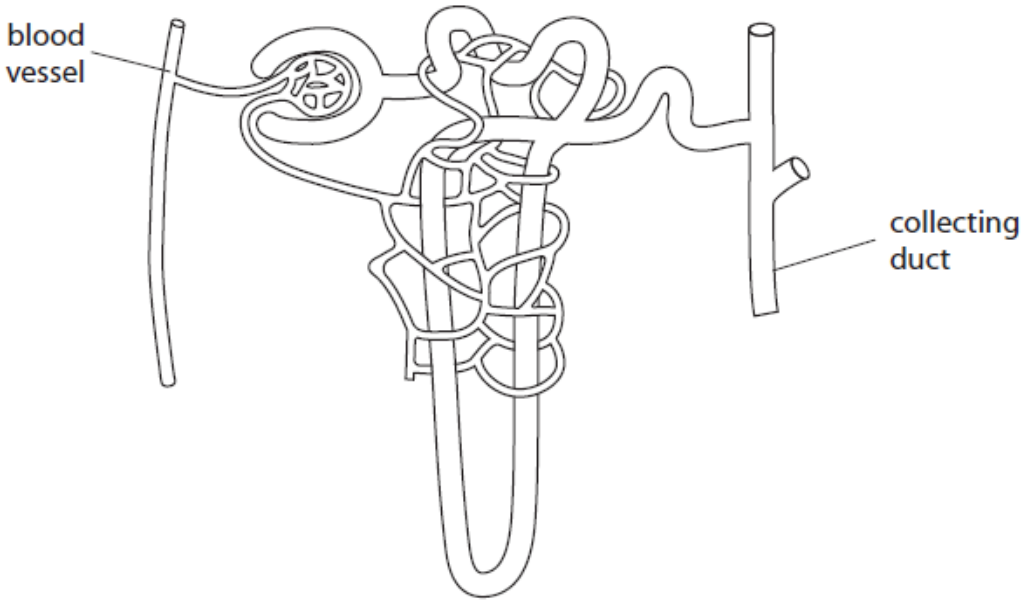


Figure 16

Explain how substances are exchanged between the blood entering the nephron and the filtrate leaving the collecting duct.

Include reference to named structures of the nephron in your answer.

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(Total for question = 6 marks)

Q5.

Explain how sweating helps to cool the body.

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(Total for question = 2 marks)

Q6.

Explain how the release of adrenalin can result in the improved performance of an athlete.

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(Total for question = 4 marks)

Q7.

Figure 17 shows the concentration of the hormones oestrogen and progesterone in the blood of women of different ages.

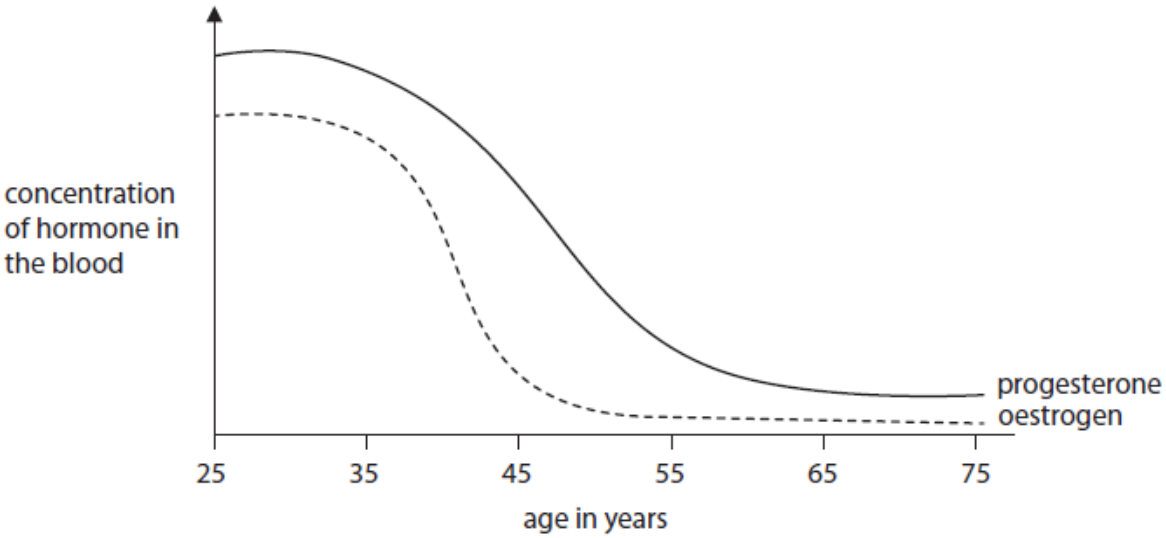


Figure 17

(i) Use information from Figure 17 to explain why women over the age of 50 are less likely to ovulate.

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(ii) Use information from Figure 17 to explain why women are less likely to menstruate after the age of 60.

(2)

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(iii) Explain how clomifene therapy may increase the chance of a woman over the age of 50 becoming pregnant.

(2)

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(iv) The hormone progesterone is produced by the

(1)

- ☒ **A** corpus luteum
- ☒ **B** pituitary
- ☒ **C** thyroid
- ☒ **D** uterus

(Total for question = 7 marks)

Q8.

Excessive weight gain and obesity increase the likelihood of developing type 2 diabetes.

Explain the effect of type 2 diabetes on the body.

(3)

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(Total for question = 3 marks)

Q9.

The kangaroo rat is a mammal that can survive in desert environments and can tolerate much higher concentrations of sodium ions in their bloodstream than humans.

Figure 16 shows an image of the kangaroo rat.



(Source: Richard R. Hansen/Science Photo Library)

Figure 16

(a) The name of the process that controls water levels in the body is

(1)

☒ **A** diffusion

☒ **B** osmosis

☒ **C** osmoregulation

☒ **D** thermoregulation

(b) (i) Explain how the blood entering the nephron of the kangaroo rat is filtered to remove excess sodium ions and water.

(3)

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The kangaroo rat has a longer loop of Henle than most mammals.

(ii) Explain why this adaptation is beneficial to the kangaroo rat.

(2)

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The volume of ADH stored in the pituitary gland of the kangaroo rat was measured.

Figure 17 shows the average results for 500 kangaroo rats.

concentration of sodium chloride fed to kangaroo rats (mol dm^{-3})	volume of ADH stored in the pituitary gland (arbitrary units)
0.00	45
0.25	40
0.50	10
0.75	8
1.00	8

Figure 17

*(iii) Explain how ADH helps to control the levels of water and sodium ions in the bloodstream.

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(Total for question = 12 marks)

Q10.

Explain why it is important to control the internal temperature of the human body.

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(Total for question = 2 marks)

Q11.

Hormones are also used as a method of contraception.

Explain why taking high levels of oestrogen and progesterone in the combined contraceptive pill reduces the chance of pregnancy.

(2)

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(Total for question = 2 marks)

Q12.

A person had symptoms including difficulty passing urine, aching in the lower abdomen, constant thirst and fainting.

A sample of their urine was tested.
The results are shown in Figure 8.

test	result	acceptable range
Glucose	200 mg per dl	0 to 130 mg per dl
Albumin (protein)	16 mg per dl	0 to 3 mg per dl
pH	3	5 to 7
Leukocytes (white blood cells)	40	2 to 5

Figure 8

(i) A doctor analysed the results and asked the person to have further tests for type 2 diabetes.

Give a reason why the doctor came to this conclusion.

(1)

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(ii) Explain why the doctor also concluded that the person had a kidney infection.

(2)

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(Total for question = 3 marks)

Q13.

* Explain how glucose is reabsorbed into the blood of a person and why glucose can be found in the urine of a person with diabetes.

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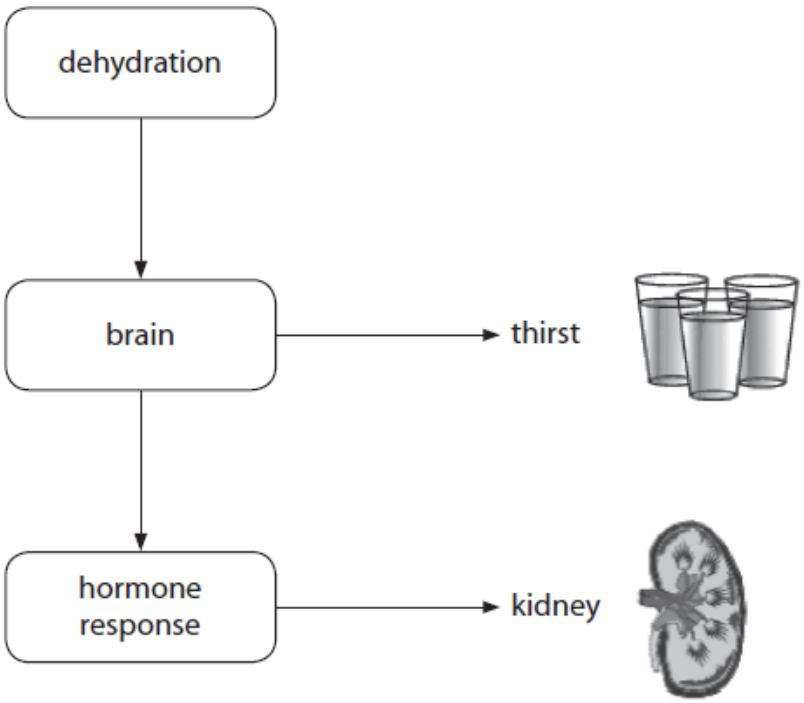
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(Total for question = 6 marks)

Q14.

Hormonal control

The diagram shows the body's response to dehydration.



(a) Use the diagram to help explain the body's hormonal response to dehydration.

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(b) The menstrual cycle is also controlled by hormones including progesterone.

(i) Complete the sentence by putting a cross (☒) in the box next to your answer.

Progesterone is produced by the

(1)

☒ **A** corpus luteum

☒ **B** glomerulus

☒ **C** hypothalamus

☒ **D** pituitary gland

(ii) Describe the effect of high levels of progesterone on the uterus lining during pregnancy.

(1)

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*(b) (iii) Explain how the menstrual cycle is controlled by hormones and negative feedback.

(6)

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(Total for question = 12 marks)

Q15.

Hormones control the menstrual cycle.

(i) Which row of the table shows where the hormones LH and oestrogen are produced?

(1)

	LH	oestrogen
☒ **A**	pituitary	ovaries
☒ **B**	ovaries	pituitary
☒ **C**	ovaries	ovaries
☒ **D**	pituitary	pituitary

(ii) Figure 12 shows the body temperature and oestrogen level for a fertile woman during a 30 day menstrual cycle.

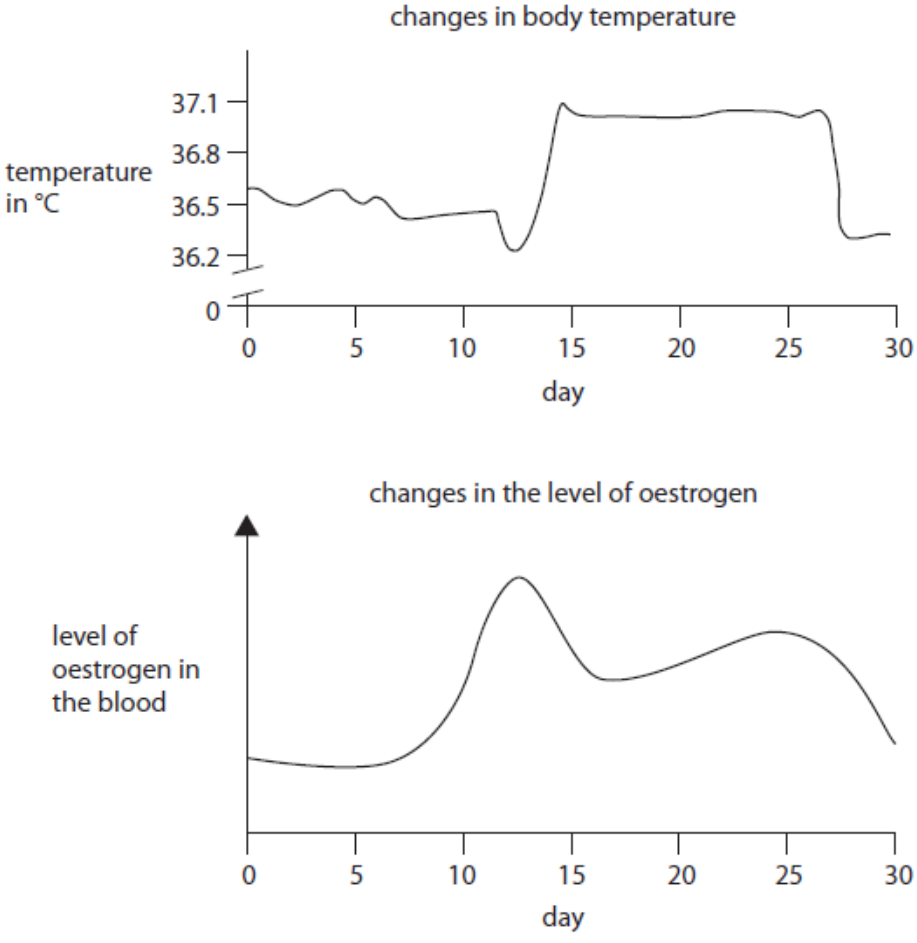


Figure 12

Describe the correlation between body temperature and oestrogen levels from day 5 to day 25.

(2)

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(iii) Explain how monitoring a woman's body temperature can be used to increase her chance of becoming pregnant.

(2)

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(Total for question = 5 marks)

Q16.

Explain how high levels of amino acids in the blood cause a high concentration of urea in urine.

(4)

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(Total for question = 4 marks)

Q17.

Hormones control the menstrual cycle.

* Explain how hormones control the menstrual cycle.

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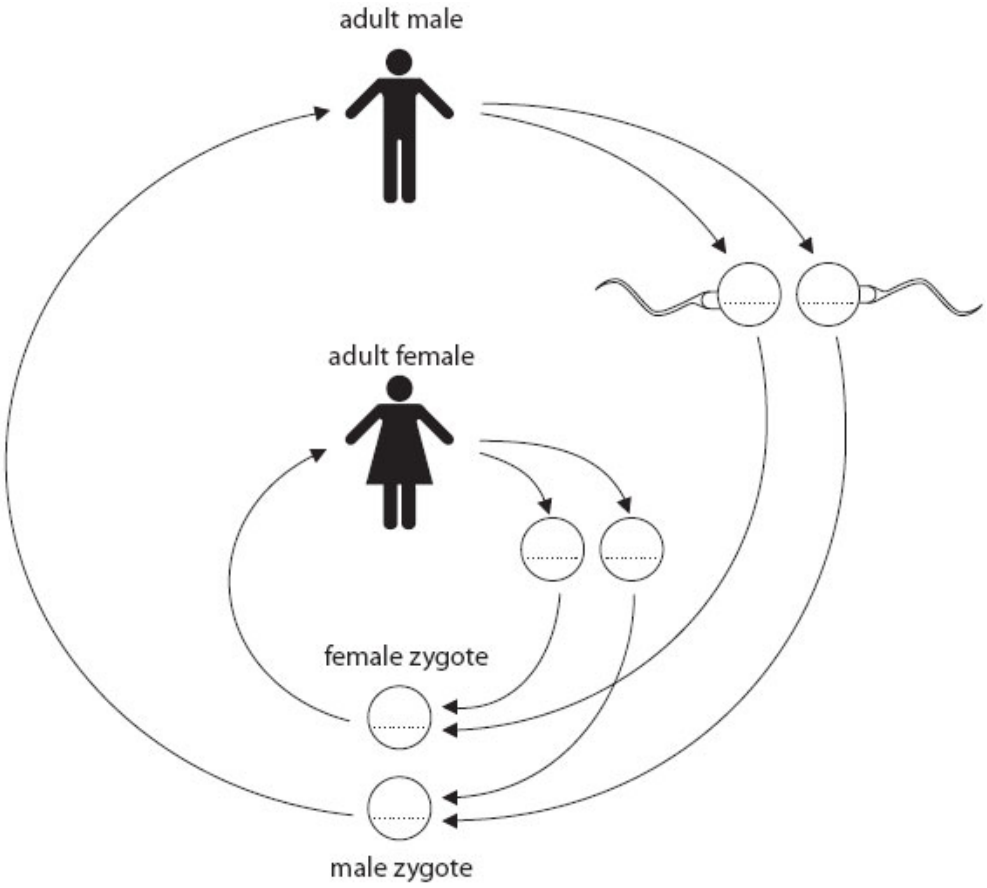
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(Total for question = 6 marks)

Q18.

The diagram shows the human life cycle.

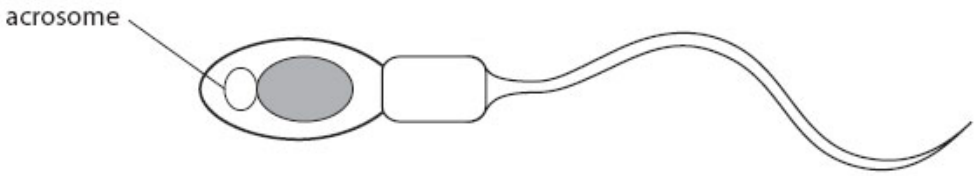
When a sperm cell fertilises an egg cell, a zygote is formed.



(a) Complete the diagram by writing the sex chromosomes in the egg cells, sperm cells, male zygote and female zygote.

(2)

(b) The diagram shows a sperm cell.



Complete the sentence by putting a cross (☒) in the box next to your answer.

The acrosome contains

(1)

- ☒ **A** enzymes to help get through the membrane of the egg cell
- ☒ **B** mitochondria to supply energy to swim
- ☒ **C** muscle fibres to swim
- ☒ **D** 23 chromosomes

(c) State why egg cells have a large amount of cytoplasm.

(1)

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(d) During ovulation an egg cell is released from the ovary.

Explain how changes in the levels of hormones result in ovulation.

(2)

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(e) Explain what happens to the uterus lining if the egg cell is fertilised.

(2)

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(Total for Question = 8 marks)

Q19.

Answer the question with a cross in the box you think is correct ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

Methods of contraception include use of hormones and barrier methods.

(i) Which form of contraception is a barrier method?

(1)

☒ **A** oral contraception

☒ **B** female condom

☒ **C** rhythm (calendar) method

☒ **D** contraceptive implant

(ii) State why a barrier method of contraception may be used in addition to a hormonal method.

(1)

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(Total for question = 2 marks)

Q20.

(i) Women with the condition known as polycystic ovary syndrome (PCOS) do not ovulate regularly.

Women with PCOS can be treated using clomifene therapy.

Clomifene therapy stimulates the production of FSH.

Name the endocrine gland that produces FSH.

(1)

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(ii) During this therapy, a woman takes a clomifene tablet each day for the first five days of her menstrual cycle.

Describe the changes that would happen inside the ovaries during the first five days of this treatment.

(2)

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(iii) Which hormone causes ovulation?

(1)

☒ **A** LH

☒ **B** FSH

☒ **C** testosterone

☒ **D** progesterone

(iv) During clomifene therapy, the woman has a blood test on day 20 of the menstrual cycle.

The blood test shows a high level of progesterone.

Explain the cause of this high level of progesterone on day 20 of the menstrual cycle.

(2)

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(Total for question = 6 marks)