6.6 Hormones, Homeostasis & Reproduction

Question Paper

Course	DP IB Biology
Section	6. Human Physiology
Topic	6.6 Hormones, Homeostasis & Reproduction
Difficulty	Easy

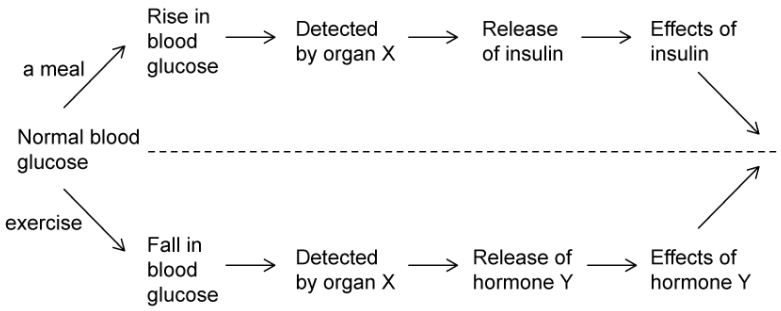
Time allowed: 50

Score: /40

Percentage: /100

Question 1a

a)
The diagram below shows some of the events that take place during the regulation of blood glucose.



Identify organ **X**.

[1 mark]

[1 mark]

Question 1b

b)
Insulin is released when organ **X** detects a rise in blood glucose levels.

Describe the effects of insulin that restore blood glucose to normal levels.

[2 marks]

[2 marks]

Question 1c

c)
When blood glucose levels fall after exercise organ **X** releases another hormone, hormone **Y**.

i)
Name hormone **Y**.

[1 mark]

ii)
State one mechanism by which hormone **Y** causes blood glucose levels to return to normal.

[1 mark]

[2 marks]

Question 1d

d)
The table below shows some doctor's notes for a patient with diabetes.

Patient age:	9
Patient symptoms:	More thirsty than usual Increased urine production Weight loss Fatigue
White blood cell activity:	High
Suggested treatment:	Monitoring blood glucose levels Insulin injections

Identify, with a reason, whether the patient is likely to have type I or type II diabetes.

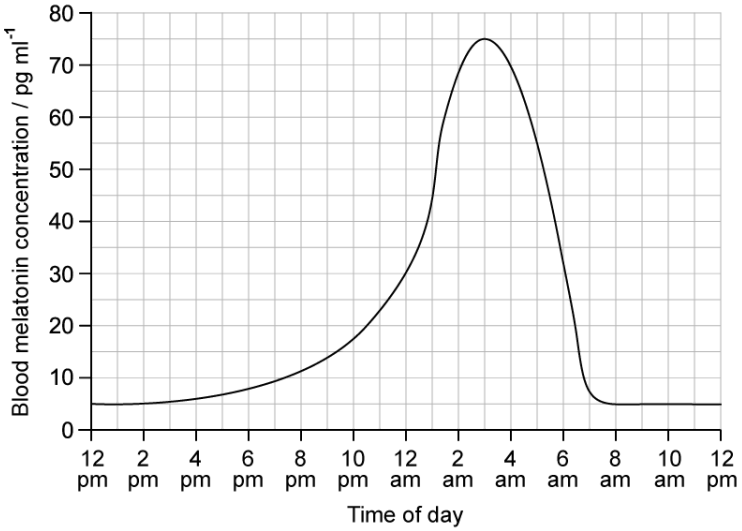
[2 marks]

[2 marks]

Question 2a

a)

The graph below shows changes in levels of the hormone melatonin over a 24–hour period. Blood melatonin concentration is measured in picograms per ml.



Calculate the percentage increase in melatonin concentration between 2 pm and 12 am.

[2 marks]

[2 marks]

Question 2b

b)

Identify **one** physiological changes that would occur between 2 pm and 3 am in the body of an individual with the melatonin levels shown in part a).

[1 mark]

[1 mark]

Question 2c

c)
Another hormone is thyroxin.

Identify the gland that secretes thyroxin.

[1 mark]

[1 mark]

Question 2d

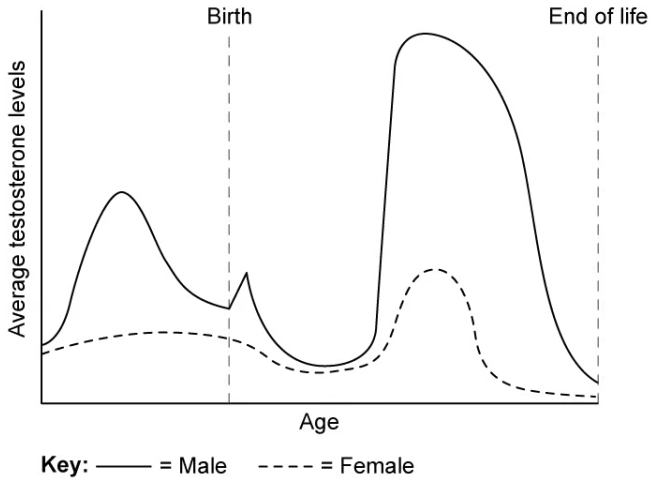
d)
Outline the part played by thyroxin in regulating body temperature.

[2 marks]

[2 marks]

Question 3a

a)
The graph below shows changing testosterone levels in male and female humans from before birth until old-age. Note that the scale on the x-axis is not evenly distributed.



Compare and contrast the changes in testosterone levels for males and females.

[3 marks]

[3 marks]

Question 3b

b)
Outline the reason for the difference in testosterone levels between males and females.

[3 marks]

[3 marks]

Question 3c

c)
Label the graph in part a) with an **X** at roughly the point at which puberty begins in males.

[1 mark]

[1 mark]

Question 3d

d)
State **two** physiological changes that would occur in males at the point you have marked **X** on the graph in part a).

[2 marks]

[2 marks]

Question 4a

a)

Explain why William Harvey's 17th Century attempts to observe the events surrounding fertilisation were unsuccessful.

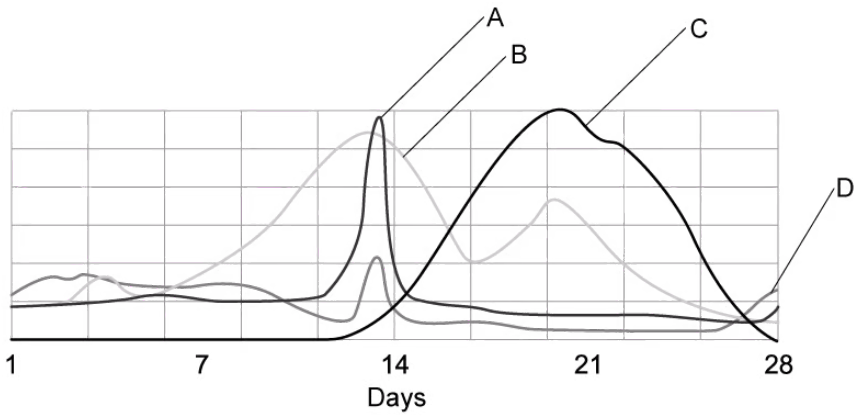
[2 marks]

[2 marks]

Question 4b

b)

The process of reproduction is controlled by a series of hormones. The graph below shows changes in the levels of reproductive hormones **A-D** in females during a single menstrual cycle.



Identify, with a reason, the hormone represented by line **A**.

[2 marks]

[1 mark]

Question 4c

c)
Line **C** represents the hormone progesterone.

i)
Identify the source of the hormone progesterone during the regular menstrual cycle.

[1 mark]

ii)
State **one** role of progesterone.

[1 mark]

[2 marks]

Question 4d

d)
A common treatment for fertility problems is *in vitro* fertilisation, or IVF. During IVF a woman will be given medication containing the hormone FSH.

Explain why medication containing FSH is administered during IVF.

[2 marks]

[2 marks]

Question 5a

One mark is available for clarity of communication throughout this question.

a)
Draw a labelled diagram of the female reproductive system.

[4 marks]

[4 marks]

Question 5b

b)
Outline the role of the hormone leptin.

[3 marks]

[3 marks]

Question 5c

c)
Compare and contrast type 1 and type 2 diabetes.

[4 marks]

[4 marks]