B11- Hormonal Coordination Exam Practice 1

Name:

Score:

Q1.

This question is about hormones.

(a) Draw **one** line from each hormone to the function of that hormone.

Hormone	Function
Follicle stimulating hormone (FSH)	Matures an egg
Testosterone	Reduces blood glucose concentration
	Stimulates sperm production

(2)

(b) In one menstrual cycle, an egg is released on day 13.

Which chemical causes the egg to be released?

Tick (✓) **one** box.

- Cholesterol ☐
- Insulin ☐
- Lipase ☐
- Luteinising hormone ☐

(1)

(c) Hormones are used in some methods of contraception.

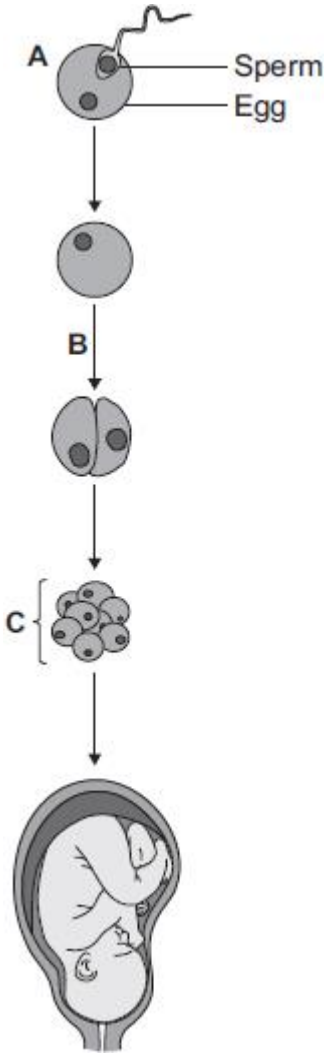
Which **two** types of contraception use hormones?

Tick (✓) **two** boxes.

Condom	☐
Diaphragm	☐
Oral contraceptive pill	☐
Skin patch	☐
Surgical sterilisation	☐

(2)

The figure below shows how a baby is formed.



Use the figure above to answer parts (d) to (f).

(d) Name the process happening at **A**.

_____

(1)

(e) The sperm and egg were formed by meiosis.

Meiosis is a type of cell division.

Name the type of cell division happening at **B**.

_____

(1)

(f) At **C** the cells are stem cells.

Explain how the stem cells become cells that can carry nervous impulses.

_____

_____

_____

_____

(2)

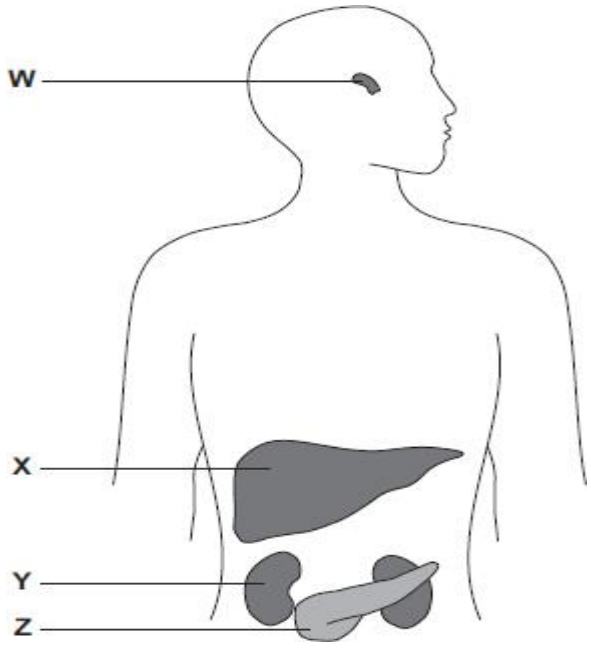
(Total 9 marks)

Q2.

The endocrine system releases hormones into the blood.

Figure 1 shows some endocrine glands and some target organs.

Figure 1



(a) Which structure is the pituitary gland?

Tick (✓) **one** box.

W ☐ **X** ☐ **Y** ☐ **Z** ☐

(1)

(b) Which is the main **target** organ of the hormone insulin?

Tick (✓) **one** box.

Kidney ☐ Liver ☐ Pancreas ☐

(1)

(c) The endocrine system sends hormones to target organs.

The nervous system sends impulses to target organs.

How does the speed of movement of hormones compare with the speed of transmission of impulses?

Tick (✓) **one** box.

Hormones travel more slowly than impulses. ☐

Hormones travel at the same speed as impulses. ☐

Hormones travel more quickly than impulses. ☐

(1)

(d) The pituitary gland releases hormones, which results in widespread effects on the body.

Explain why the pituitary gland is sometimes called the 'master gland'.

_____

_____

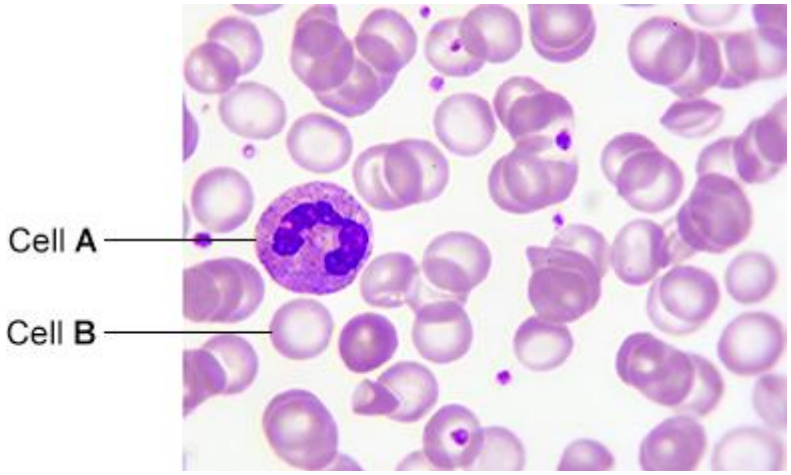
_____

_____

(2)

Figure 2 shows human blood viewed through a light microscope.

Figure 2



(e) Name cell **A** and cell **B**.

A _____

B _____

(2)

(f) The image of a cell has a diameter of 3.5 millimetres.

The magnification of the image is ×500.

Calculate the diameter of the real cell.

Give your answer in micrometres.

Use the equation:

$$\text{magnification} = \frac{\text{diameter of image}}{\text{diameter of real cell}}$$

1 millimetre = 1000 micrometres

_____

_____

_____

_____

_____

_____

_____

Diameter of the real cell = _____ micrometres

(4)

(Total 11 marks)

Higher Tier Questions

Q3.

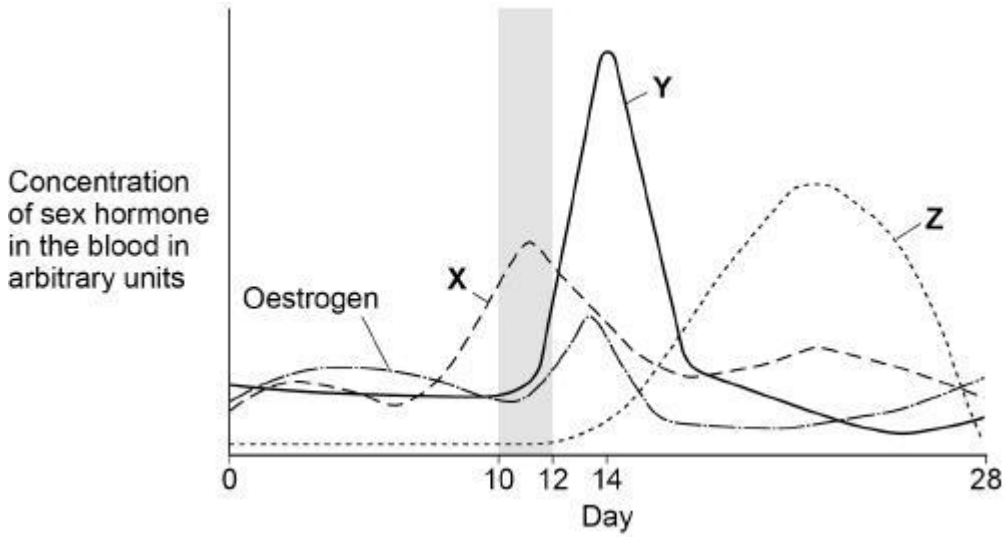
Endocrine glands produce hormones.

(a) Which hormone stimulates basal metabolic rate?

_____

(1)

The diagram below shows how concentrations of sex hormones in the blood vary during a 28-day menstrual cycle.



(b) Which hormone does **X** represent?

Tick (✓) **one** box.

FSH ☐

LH ☐

Progesterone ☐

Testosterone ☐

(1)

(c) Which hormone does **Z** represent?

Tick (✓) **one** box.

FSH ☐

LH ☐

Progesterone ☐

Testosterone ☐

(1)

(d) Describe **two** effects of oestrogen between day 10 and day 12 of the menstrual cycle.

1. _____

_____

2. _____

_____

(2)

In vitro fertilisation (IVF) is a fertility treatment.

(e) Hormones are used in IVF treatment.

Explain how different hormones are used to help a woman become pregnant.

_____

_____

_____

_____

_____

_____

(3)

(f) The table below shows information about IVF success rates.

Age of woman in years	Percentage (%) of IVF treatments resulting in pregnancy
<35	29
35–37	23
38–39	15
40–42	9
43–44	3
>44	2

A 35-year-old woman with fertility problems wants a child.

Suggest why she should start IVF treatment as soon as possible.

You **must** include data from table above in your answer.

_____

_____

_____

(1)

(Total 9 marks)

Q4.

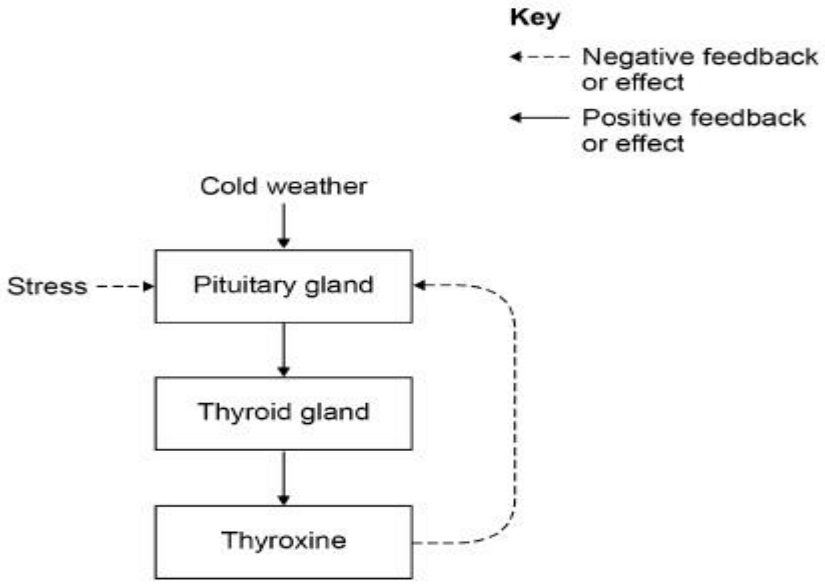
Thyroxine is produced by the thyroid gland and released into the blood.

(a) What type of chemical is thyroxine?

_____

(1)

The diagram shows how the release of thyroxine is controlled.



(b) Explain how the body regulates the amount of thyroxine that is produced if the body is **not** stressed or cold.

Use information shown in the diagram.

_____

_____

_____

_____

(2)

Thyroxine stimulates basal metabolic rate.

One important chemical reaction of metabolism is respiration.

(c) Explain how the feedback mechanism in the diagram maintains normal body temperature in cold weather.

Use the information in the diagram and your own knowledge.

_____

_____

_____

(3)

(d) People in stressful situations produce a chemical that reduces the activity of the pituitary gland.

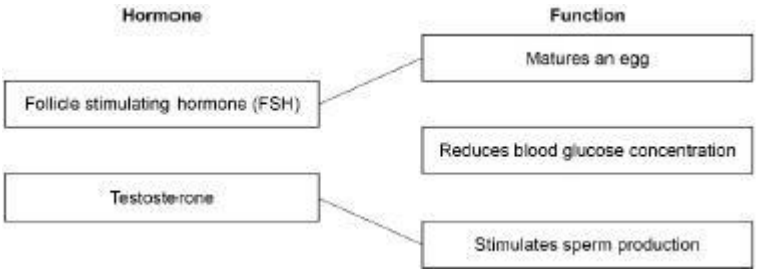
Explain how this can cause people to gain weight.

(3)

(Total 9 marks)

Q1.

(a)



do not accept more than one line from a box on the left

1
1

(b) luteinising hormone

1

(c) oral contraceptive pill

1

skin patch

1

(d) fertilisation

ignore description of fertilisation

1

(e) mitosis

allow phonetic spelling

1

(f) differentiation

allow specialisation

1

into (sensory / motor / relay) neurone(s)

allow into (sensory / motor / relay) nerve cells

1

[9]

Q2.

(a) W

1

(b) liver

1

(c) hormones travel more slowly than impulses

1

(d) (the hormones) act on other glands

1

to (stimulate / cause) release of other hormone(s)

1

(e) (**A**) white blood cell

this order only

ignore WBC

allow named white blood cell

1

(**B**) red blood cell

ignore RBC

1

(f) $500 = \frac{3.5}{\text{diameter of real cell}}$

allow conversion of unit at any point in the calculation

1

diameter of real cell = $\frac{3.5}{500}$

1

diameter of real cell = 0.007

1

(diameter of real cell = 0.007 × 1000 =) 7 (micrometres)

1

[11]

Higher Tier Mark Scheme

Q3.

(a) thyroxine

allow phonetic spelling

1

(b) FSH

1

(c) progesterone

1

(d) any **two** from:

- stimulates growth of the uterus lining

  allow builds up the uterus lining
  allow maintains the uterus lining
  *do **not** accept reference to the uterus wall*
- stimulates the release of LH / **Y**
- inhibits FSH / **X**

2

(e) FSH is given to stimulate the maturation of (many) eggs / ova

1

(then) LH is given to stimulate ovulation / egg release

1

(so) more eggs / ova are released which increases the chance / probability of fertilisation

1

(f) success rates fall as age increases giving correct data

examples of correct data:
- *the success rate falls from 23% to 2% when a women is over 44*
- *success rates drop by 8% to only 15% when she reaches the age of 38 years*
- *drops by 14% to only 9% when she reaches the age of 40 years*
- *drops by 20% to only 3% when she reaches the age of 43 years*

1

[9]

Q4.

(a) hormone

ignore protein

1

(b) (once a certain amount of thyroxine has been produced)

(thyroxine) inhibits / prevents / stops (pituitary gland from) stimulation of the thyroid gland

1

so less thyroxine is produced

1

(c) cold weather stimulates the pituitary gland, which stimulates the thyroid gland to produce <u>more</u> thyroxine

1

increased / more thyroxine raises basal metabolic rate

1

which increases rate of respiration, which increases body temperature

1

(d) less stimulation of thyroid gland, so less thyroxine produced / released

1

so basal metabolic rate decreases

1

therefore reduced respiration rate, so more food stored as fat

1

[9]