

1. The diagram below represents the homeostatic control of body temperature. What does the part labelled X represent?

- A. Heart
- B. Kidney
- C. Pituitary
- D. Hypothalamus

(Total 1 mark)

2. What is the sequence of operations during IVF treatment?

- A. egg collection → FSH injections → fertilization
- B. egg collection → fertilization → FSH injections
- C. FSH injections → egg collection → fertilization
- D. FSH injections → fertilization → egg collection

(Total 1 mark)

3. The diagram below shows the male reproductive system.

Which are the epididymis and the seminal vesicle in the diagram?

	Epididymis	Seminal vesicle
A.	IV	I
B.	III	II
C.	I	V
D.	III	I

(Total 1 mark)

4. What is placed into the uterus after the process of *in vitro* fertilization (IVF)?

- A. Eggs
- B. Sperm
- C. Embryos
- D. Fetuses

(Total 1 mark)

5. The following diagram shows the human female reproductive system as seen from the side.

[This article was published in Jones, R and Lopez, K. 2006. *Human Reproductive Biology*. Third Edition. Academic Press. P. 52. Copyright Elsevier 2006.]

What are the names of the organs labelled I and II?

	I	II
A.	uterus	vagina
B.	bladder	ovary
C.	urethra	oviduct
D.	clitoris	cervix

(Total 1 mark)

6. What is a difference between human sperm and human egg cells?

- A. Sperm have more chromosomes.
- B. Sperm have a larger surface area to volume ratio.
- C. Eggs have an acrosome.
- D. The division of the cytoplasm in sperm production is uneven.

(Total 1 mark)

7. A number of different proteins are involved in nerve function. Which of the following does **not** require a membrane protein?

- A. Active transport of sodium
- B. Diffusion of K^+ into the cell
- C. Diffusion of the neurotransmitter across the synapse
- D. Binding of the neurotransmitter to the post-synaptic membrane

(Total 1 mark)

8. Which words from the table below complete the sentence correctly?

In the pancreas, ____I____ secrete glucagon, which ____II____ blood glucose levels.

	I	II
A.	α cells	raises
B.	β cells	raises
C.	α cells	lowers
D.	β cells	lowers

(Total 1 mark)

9. What are causes of type I and type II diabetes?

	Type I	Type II
A.	autoimmune disease leading to reduced insulin secretion	decreased responsiveness of the body to insulin
B.	decreased responsiveness of the body to insulin	autoimmune disease leading to reduced insulin secretion
C.	increased responsiveness of the body to insulin	autoimmune disease leading to increased insulin secretion
D.	autoimmune disease leading to increased insulin secretion	increased responsiveness of the body to insulin

(Total 1 mark)

10. What is a role of the hypothalamus in homeostasis?

- A. Monitoring body temperature
- B. Monitoring blood glucose concentration
- C. Secretion of glucagon
- D. Secretion of sweat

(Total 1 mark)

11. On the diagram of the motor neurone shown below, which label identifies a dendrite?

(Total 1 mark)

12. Between which structures do sensory neurons carry nerve impulses?

- A. From receptors to muscles
- B. From effectors to the central nervous system (CNS)
- C. From the central nervous system (CNS) to receptors
- D. From receptors to the central nervous system (CNS)

(Total 1 mark)

13. A process occurs in which the inside of a neuron develops a net positive charge compared with the outside. What is the name of this process?

- A. Resting potential
- B. Repolarization
- C. Depolarization
- D. Hyperpolarization

(Total 1 mark)

14. In the diagram of synaptic transmission below, what is indicated by the letters X and Y?

[Source: http://en.wikipedia.org/wiki/File:Synapse_Illustration2_tweaked.svg. Image by Nrets.]

	X	Y
A.	neurotransmitter enters synaptic knob	Ca ²⁺ ions
B.	Ca ²⁺ ions diffuse into the synaptic knob	neurotransmitter
C.	K ⁺ ions diffuse into the synaptic knob	neurotransmitter
D.	Na ⁺ ions diffuse into the synaptic knob	Ca ²⁺ ions

(Total 1 mark)

15. The diagram below shows the changes in membrane potential during an action potential. What occurs at the stages labelled 1 and 2?

	1	2
A.	Na ⁺ ions diffuse in; inside becomes more positive	K ⁺ ions diffuse out; inside becomes more negative
B.	K ⁺ ions diffuse out; inside becomes more negative	Na ⁺ ions diffuse in; inside becomes more positive
C.	Na ⁺ ions diffuse out; inside becomes more negative	K ⁺ ions diffuse out; inside becomes more positive
D.	Na ⁺ ions diffuse in; inside becomes more positive	K ⁺ ions diffuse in; inside becomes more negative

(Total 1 mark)

16. The graph below shows the levels of hormones during the menstrual cycle.

(a) Identify hormones I and II.

I:

II:

(2)

(b) Outline the roles of FSH in the menstrual cycle.

.....

(2)

(c) FSH is secreted by the pituitary gland. During pregnancy, FSH secretion is inhibited. Suggest how FSH secretion could be inhibited during pregnancy.

.....

(1)

(Total 5 marks)

17. The diagram below shows the female reproductive system.

(a) Label the diagram above with the letter U to show the uterus. (1)

(b) Outline the role of luteinizing hormone (LH) **after** ovulation.
.....
..... (1)

(c) Explain how sexual reproduction can lead to variation in a species.
.....
.....
.....
.....
.....
..... (3)
(Total 5 marks)

18. *Up to two additional marks are available for the construction of your answers.* (2)

(a) Draw a labelled diagram showing the structure of a motor neurone. (4)

(b) Outline how heartbeat is controlled as the body goes from rest to hard exercise. (6)

(c) Explain how skeletal muscle contracts. (8)
(Total 20 marks)