**Review Worksheet ANSWERS: Thyroid and Parathyroids**

1: How does the body detect low levels of thyroid hormone in the blood?

(2 marks)

*The hypothalamus senses the low levels of thyroid hormone (1) or signs of low BMI such as decreased body temperature. (1)*

2: What hormone stimulates the thyroid to produce thyroxine, and where is that hormone produced?

(2 marks)

*TSH (Thyroid Stimulating Hormone) (1) produced by the Anterior Pituitary (1)*

3: Propose a reason that TSH only affects the thyroid, but thyroxine affects most body cells?\*

(4 marks)

*Hormone receptors are specific (1) which means that each hormone can only bind to its matching receptor (1). Only the thyroid has receptors for TSH (1), but almost all body cells have receptors for Thyroxine.(1)*

4: How does the body know when to stop producing thyroxine?

(4 marks)

*Rising thyroxine levels (1) inhibit further production of TRF by the hypothalamus (1), and TSH by the anterior pituitary(1). This is known as negative feedback (1)*

5: Where is TRF produced and how does it get to its target organ?

(3 marks)

*TRF is produced by the hypothalamus (1) which secretes it into the blood vessels of the infundibulum (1), which carry the TRF to the anterior pituitary (1)*

6: You are a Doctor, and a patient with suspected thyroid disease comes into the clinic. She says she is tired, feels weak and has a large bulging mass in her throat.

1. What other signs might she show if she had *hyper*thyroidism?

(4 marks)

*She might show protruding eyeballs (1) elevated heart rate (1) weight loss or gain(1) increased appetite (1).*

1. What might be causing the hyperthyroidism?

(6 marks)

*She may have Graves’ Disease (1) where the immune system produces antibodies that attack and stimulate the thyroid (1). She may have iodine deficiency (1), causing overgrowth of the thyroid tissue to try to produce more hormone (1). She may have thyroiditis (1) inflammation of the thyroid that causes overproduction of hormones. (1)*

1. How would you make a diagnosis using a blood test – what would you test for and what result would you expect for hyperthyroidism? Why?

(4 marks)

*Test for TSH levels (1), which would be low (1). This is because the high levels of thyroxine produced inhibit the release of TSH (1) due to negative feedback. (1)*

1. What are some of the available treatment options?

(5 marks)

*Radioactive iodine therapy (1) to destroy thyroid cells (1), medication to prevent use of iodine to make thyroxine (1), surgery (1) to remove all or part of the thyroid.(1)*

7: A different patient comes to your clinic, and when testing comes back, he shows low levels of T4 and high levels of TSH.

1. What disease does he have?

(1 mark)

*Hypothyroidism (1)*

1. Why would the levels of TSH be so high? \*

(6 marks)

*low levels of T4 would be detected by the hypothalamus (1), which would produce TRF (1) to stimulate the anterior pituitary (1) to produce TSH. Because the thyroid levels are persistently low (1), the anterior pituitary would be overstimulated (1), causing high levels of TSH.(1)*

1. What is the common treatment for this disease? (Assume iodine deficiency is not the cause)

(2 marks)

*Supplementation with synthetic thyroxine (1) such as Levothyroxine (1)*