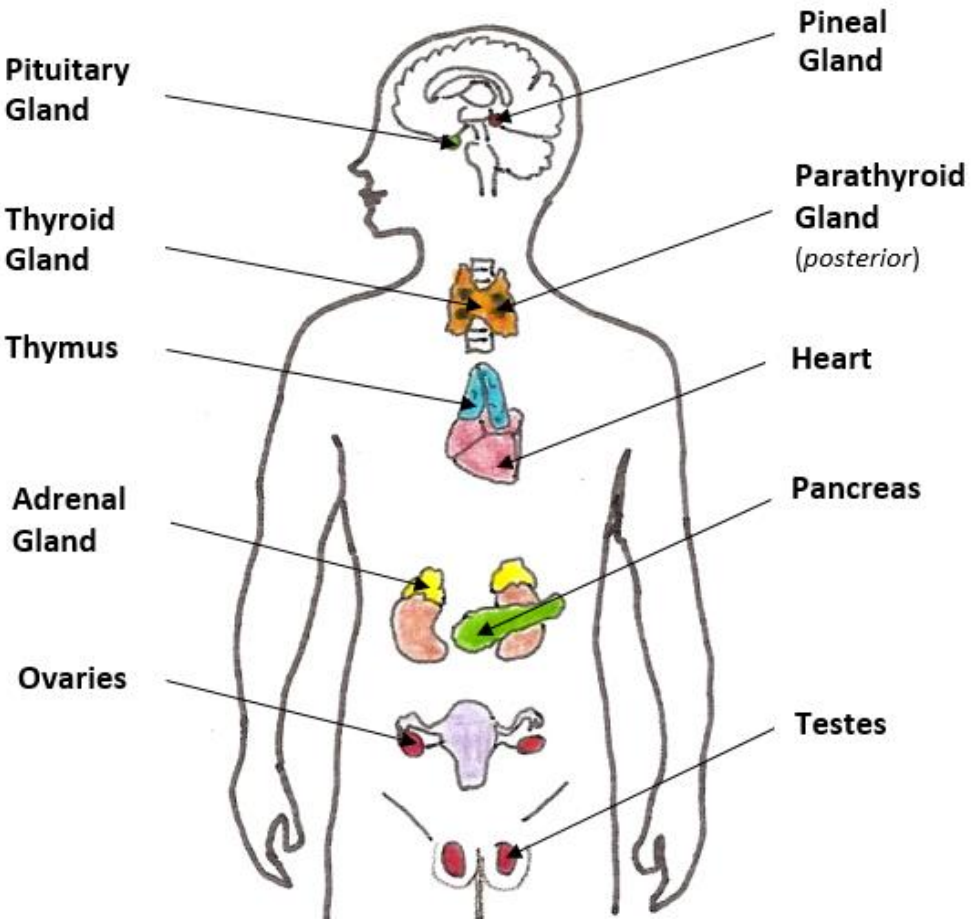
Name: _____

Physiology: Endocrine System Worksheet

Directions: Write in and circle best answer on this sheet.

Use this diagram to identify the various endocrine glands and structures and link them to each of the basic descriptive statements below:



A. _____ located in the throat; bi-lobed gland connected by an isthmus.

B. _____ found sitting on top of the kidneys.

C. _____ connected to the hypothalamus, it has a front and back portion.

D. _____ paired glands suspended in the scrotum outside of the body.

E. _____ small structures sitting on the posterior surface of the thyroid gland.

F. _____ found in the pelvic cavity of females, concerned with ova and estrogen.

G. _____ sits in the upper thorax overlying the heart.

H. _____ found in the center of the brain and shaped like a tiny pine cone.

I. _____ a mixed gland, located close to the stomach and small intestine.

J. _____ although not a primary endocrine gland, it releases ANP hormone.

1. The etymology of 'endocrine' comes from endo = _____, and -crine = _____, thus it loosely means _____.

2. What is the difference between **primary** and **secondary** endocrine glands?

1°:

2°:

3. What makes a cell a target for a specific hormone?

4. Why is it necessary for hormone action to be terminated? How is hormone action terminated?

5. Define *half-life* as it applies to hormones. _____.

6. Hormones are _____ signals released into the _____ by endocrine glands.

7. What are the **3 main types of hormones**? (Based on what they are *derived* from):

A) B) C)

8. Of the above 3 categories, the majority of hormones in the body are _____ hormones.

9. Can you think of a hormone that may take months to have its affects? _____.

10. Can you think of a hormone that only takes seconds to have its affects? _____.

11. Target tissue is defined as: _____.

12. If hormones travel where ever blood goes, why don't all cells respond to all hormones?

13. Hormones belong to **2 groups** based on **solubility**: **1)** _____ and **2)** _____.

14. The _____ hormones often change DNA transcription in the nucleus.

15. The _____ hormones are not lipid soluble and so must bind to the plasma membrane.

16. For cells to respond to any hormone, they must have _____ for that hormone.

17. If one hormone has an opposing action to another, this interaction is termed _____.

Negative Feedback Loop Inhibition

Almost all hormones secreted are controlled by **negative feedback loops**. When a hormone level becomes elevated, persistently high levels will inhibit the production of it, resulting in a decline in its levels. The **hypothalamus** and **pituitary gland** are good examples of this type of control.

18. Another name for the anterior pituitary gland is _____.

19. What does this name mean and imply? _____.

20. Another name for the posterior pituitary gland is _____.

21. What does this name mean and imply? _____.

22. What are the **6 hormones** released by the **anterior pituitary** gland? (No abbreviations here!)

1)

2)

3)

4)

5)

6)

23. What are the **2 hormones** released by the posterior pituitary gland? (No abbreviations here!)

1)

2)

Table 1. Fill in the information about the hormone, gland or action that is compatible.

Hormone	**Secreted by**	**Actions**
Luteinizing Hormone (LH)		
	Posterior Pituitary (for water regulation)	
		Stimulates cortisol release. +
Melatonin		
		Stimulates follicular growth in females; required for sperm production in males.
	Pancreas (α cells)	
Cortisol		
		Stimulates release of T_3 and T_4 and helps regulate metabolic rate.

Based on the information provided about these endocrine glands and their function, for each hormone in **Column A**, select the appropriate endocrine gland that makes it from **Column B**. The various endocrine glands in Column B may be used more than once or not at all.

Column A

___ 1. LH
___ 2. oxytocin
___ 3. DMT
___ 4. prolactin
___ 5. PTH
___ 6. renin
___ 7. T_4/T_3
___ 8. FSH
___ 9. thymosine
___ 10. TSH
___ 11. melatonin
___ 12. somatostatin
___ 13. Calcitonin
___ 14. Vasopressin
___ 15. hGH
___ 16. ANP
___ 17. T-cell differentiation
___ 18. cortisol

Column B

A. Parathyroid glands
B. Pineal gland
C. Neurohypophysis
D. Thymus
E. Thyroid gland
F. Heart
G. Pineal gland
H. Adenohypophysis
I. Adrenal cortex
J. Kidneys
K. Pancreas
L. Adrenal medulla

24. Identify three types of hormone interactions.

1)

2)

3)

25. Describe **synergism** as it pertains to hormone interactions. Give an example of a synergistic hormone interaction.

26. Describe **permissiveness** as it pertains to hormone interactions. Give an example of a permissive hormone interaction.

27. Describe **antagonism** as it pertains to hormone interactions. Give an example of an antagonistic hormone interaction.

28. How many hormones are produced by the posterior pituitary? _____.

29. The pituitary hormone that controls hormone synthesis and release from the thyroid gland is: _____.

30. The actual site of vasopressin synthesis occurs in the _____.

Suggest which hormone is either over or under-produced and what cells, tissues or glands are responsible.

31. If too much bones growth occurs after the growth plates have fused together, then bones can no longer grow in length but instead widen & thicken. This happens when _____ is released in _____ amounts. In adults this disorder is called _____.

32. Results in increased metabolic rate, elevated heart rate, weight loss, sweating, high BP, and protruding eyeballs. This is due to _____ amounts of the hormone _____ released from the _____. The common name for this condition is _____ disease.

33. If too little of _____ is released or if its actions are blocked by alcohol, then it will result in large volumes of dilute urine being voided from the body, this is called _____.

34. A '*primary adrenal insufficiency*' is when an insufficient amount of the hormone _____ is released. It can also cause not enough of the hormone _____ to be released. This occurs despite the presence of an adequate amount of _____ from the anterior pituitary gland. It results in low blood pressure, hypoglycemia and fatigue, and is called _____disease.

Table 2. Fill in the table below with relevant information about **Diabetes Mellitus** Type 1 and 2.

Characteristic	Type 1 Diabetes	Type 2 Diabetes
Typical age of onset		
Onset of symptoms fast/slow?		
Percentage of diabetics with this type of diabetes:		
Fasting blood glucose levels		
Natural insulin levels		
Beta cells of pancreatic islets		
Pancreatic islet cell antibodies		
Risk factors for getting disease		
Typical treatments		

List 4 symptoms that would indicate **Diabetes Mellitus**. *Also include a symptom that is different in the two types.	1) 2) 3) 4) 5)*	1) 2) 3) 4) 5)*

35. Cells cannot take up glucose due to lack of the hormone _____. It results in hyperglycemia, glycosuria, polyuria and excessive thirst. Endocrine structure is the _____.

36. A disease that occurs as the result of too much cortisol in the blood for an extended period of time. Cortisol is released from the zona _____ of the _____. The hormone that signals the release of cortisol is _____, released from the _____. The common name for this disease is _____. It results in high blood pressure, hyperglycemia and loss of muscle mass.

37. The islets of Langerhans are structures in the _____ gland. The hormone made by the alpha cells there is _____, while the hormone made by the beta cells is _____.

38. Parathyroid hormone (PTH) is triggered to be released if _____ in the blood become too low. Primarily, the PTH acts on bone cells called _____. The activity of this sell is (increased/ decreased). This change then causes a(n) _____ in _____ of the blood.

39. The _____ are the primary reproductive organs. In general, the primary reproductive structure makes the _____, these are also known as the _____ cells for reproduction. Females have _____ and these make _____ cells. The males have _____ and these make _____ cells. The female sex hormones are _____ and _____, they are made by the _____. The male sex hormone is _____ and is made by the _____.

<u>Multiple Choice and fill-in Questions – Select the best answer</u>.

40. The majority of hormones in the body are
a) peptide hormones **b)** amino acid-derived hormones **c)** steroid hormones
d) neurohormones **e)** all of the hormones are present in equal amounts in the body

41. Somatotrophs, gonadotrophs, and corticotrophs are associated with the
a) thyroid gland **b)** adenohypophysis **c)** parathyroid glands **d)** adrenal glands **e)** neurohypophysis

42. For ***adrenocorticotropic*** hormone, *cortico* means _____, and *tropic* means _____.
a) middle, and top **b)** inner (medulla), and growth **c)** outer (cortex), and growth
d) outer (cortex), and shrink **e)** inner (medulla), and growth

43. The hormone **cortisol** has which of the following effects on the body?
a) vasodilation **b)** suppresses the immune system **c)** stimulates vitamin D production
d) stimulates gluconeogenesis **e)** b and d

44. The two **antagonistic** hormones that regulate blood calcium level are:
a) growth hormone, and thyroid stimulating hormone (TSH) **b)** insulin, and glucagon
c) aldosterone, and cortisone **d)** calcitonin (CT), and parathyroid hormone (PTH)
e) estrogen, and progesterone

45. The **thymus** can be considered an endocrine gland because
1) it is in the thoracic cavity **2)** it makes ANP **3)** it is where T cells differentiate
4) it is connected to all other glands by the lymphatic system **5)** it makes thymosine
a) 1 only **b)** 5 and 2 **c)** 3, 4 and 2 **d)** 1, 2 and 4 **e)** 5 only

46. When the heart releases the hormone **Atrial Natriuretic Peptide** (ANP) its effects are:
1) vasodilation **2)** to reduce heart rate **3)** vasoconstriction **4)** stimulation of renin
5) inhibition of renin **6)** to increase sodium excretion
a) 5, 6 and 1 **b)** 1 and 5 **c)** 6, 4 and 2 **d)** 2 and 4 **e)** 5, 3 and 6

47. In terms of solubility, hormones fall into two basic categories: _____ and _____.
a) stimulator and receptor hormones **b)** proteins and sugars **c)** growth and metabolic hormones
d) male hormones and female hormones **e)** water soluble and lipid soluble (steroid) hormones

48. Typically a female is born with about _____ potential egg cells and only releases about _____.
a) 60; 40 **b)** 60,000; 40,000 **c)** 1,000; 500 **d)** 60,000; 400 **e)** 100,000; 500,000

49. The hormone that aids in sodium conservation and potassium excretion is
a) aldosterone **b)** calcitonin (CT) **c)** ADH **d)** hydrocortisone **e)** calcitonin

50. Which of the following produce testosterone?
1) the adrenal medulla **2)** interstitial cells of Leydig **3)** the adrenal cortex **4)** the hypothalamus
5) the posterior pituitary gland **6)** the anterior pituitary gland
a) 2 only **b)** 2 and 4 **c)** 4, 3 and 6 **d)** 3 and 2 **e)** 2, 6 and 3

51. If the **thyroid gland** is over-stimulated with _____, typically _____ will result.
a) TSH, a goiter
b) TSH, hypothyroidism
c) LH, hyperthyroidism
d) ACTH, hyperthyroidism
e) hGH, a goiter

52. Which of the following hormones can elevate blood glucose levels?
1) epinephrine **2)** glucagon **3)** insulin **4)** cortisol **5)** thyroxine **6)** calcitonin
a) 1, 3 and 5 **b)** 2 and 4 **c)** 1, 2 and 4 **d)** 4, 6 and 5 **e)** 2 and 3