1. Which of the following is an exocrine example?
   1. **Sweat glands**
   2. Pituitary glands
   3. Insulin secretion
   4. Neurohypophysial secretion
   5. All of the above
2. Which hornone is the result of direct neurosecretion?
   1. **Vasopressin**
   2. GH
   3. TSH
   4. Cortisol
   5. Insulin
3. Which of these hormones are steroid hormones?
   1. T4
   2. Vasopressin
   3. **Aldosterone**
   4. Noradrenaline
   5. Growth hormone
4. What chemical type is adrenaline?
   1. Peptide Hormone
   2. Protein Hormone
   3. Steroid Hormone
   4. **Biogenic Amine**
   5. None of the above
5. Which of these processes **does not** regulate the levels of a hormone in circulation?
   1. Synthesis
   2. Negative feedback loops
   3. **Receptor desensitization**
   4. Endocrine secretion
   5. Degradation
6. How are cortisol levels induced?
   1. CRH receptors on the adrenal stimulate synthesis of cortisol
   2. CRH receptors on the adrenal stimulate secretion of cortisol
   3. **ACTH receptors on the adrenal stimulate synthesis of cortisol**
   4. ACTH receptors on the adrenal stimulate secretion of cortisol
   5. None of the above
7. Which hormone causes slower, but longer lasting changes in metabolism?
   1. Adrenaline
   2. Angiotensin II
   3. Insulin
   4. **Cortisol**
   5. Glucagon
8. Nuclear hormone receptors tend to have responses that are…
   1. Slower and shorter in duration
   2. Faster and shorter in duration
   3. **Slower and longer in duration**
   4. Faster and longer in duration
   5. All of the above
9. Oxytocin levels during delivery are **not** regulated by which of these processes?
   1. **A negative feedback loop**
   2. A positive feedback loop
   3. Hypothalamic integretion
   4. Neuroendocrine secretion
   5. Mechanosensation
10. The primary site of hormonal and neural interaction is which part of the brain?
    1. Prefrontal cortex
    2. Anterior pituitary
    3. Posterior pituitary
    4. **Hypothalamus**
    5. Adrenal gland
11. Which gland is connected to the hypothalamus by the neurohypophysial portal system?
    1. Amygdala
    2. **Posterior Pituitary**
    3. Anterior Pituitary
    4. Prefontal Cortex
    5. Adrenal
12. Blood-brain barrier transport is **not** required for which hormone to affect the brain?
    1. Insulin
    2. Leptin
    3. FSH
    4. Growth Hormone
    5. **Adrenaline**
13. Which hormone can freely cross the blood brain barrier?
    1. Insulin because it is a peptide hormone
    2. Cortisol because it is a peptide hormone
    3. Insulin because it is a steroid hormone
    4. **Cortisol because it is a steroid hormone**
    5. None of these can cross an intact blood brain barrier
14. How do other parts of the brain signal to the hypothalamus?
    1. Electrical conductance
    2. Neuroendocrine secretion of factors into the blood
    3. **Synaptic contacts with the hypothalamus**
    4. All of the above
    5. None of the above
15. In the case of a hormone that causes a behavioral change such as food seeking behavior…
    1. The hormone is sensed at the hypothalamus which then signals to the pituitary to change behavior
    2. **The hormone is sensed at the hypothalamus which then signals to the cortex to change behavior**
    3. The hormone is sensed at the pituitary, which then signals to the hypothalamus to change behavior
    4. The hormone is sensed at the pituitary, which then signals to cortex to change behavior.
    5. None of the above
16. Which of these hormones are secreted into the neurohypophysial portal system?
    1. Insulin
    2. ACTH
    3. **GHRH**
    4. Vasopressin
    5. Growth Hormone
17. Disruption of the infundibulum would affect the secretion of which hormone?
    1. Adrenaline
    2. **Oxytocin**
    3. Cortisol
    4. Insulin
    5. All of the above
18. Which hormone is **not** released from the anterior pituitary
    1. **GHRH**
    2. TSH
    3. ACTH
    4. Prolactin
    5. Growth Hormone
19. Which hormone(s) negatively regulate growth hormone secretion?
    1. GHRH
    2. **Somatostatin**
    3. Thyroid Hormone
    4. Testosterone
    5. All of the above
20. What chemical type is oxytocin?
    1. **Peptide hormone**
    2. Protein hormone
    3. Steroid hormone
    4. Biogenic amine
    5. None of the above
21. Can vasopressin cross the plasma membrane?
    1. Yes because it is secreted from the posterior pituitary
    2. Yes because it is a steroid hormone
    3. Yes because it is a peptide hormone
    4. No because it is a steroid hormone
    5. **No because it is a peptide hormone**
22. How is vasopressin released into the blood?
    1. Exocrine secretion
    2. Passive diffusion across the plasma membrane
    3. Secretion into the neurohypophysial portal system
    4. **Direct secretion into the normal circulatory system**
    5. All of the above
23. What is the major target tissue of vasopressin?
    1. Heart
    2. Adipose Tissue
    3. **Kidney**
    4. Brain
    5. Muscle
24. How does vasopressin acutely regulate water reuptake?
    1. Synthesis of new water transporters
    2. **Movement of water transporters to the plasma membrane**
    3. Synthesis of new salt transporters
    4. Movement of salt transporters to the plasma membrane
    5. All of the above
25. A patient has an inherited deficiency in vasopressin receptors, rendering them unable to respond to the hormone. We would expect that this patient would.
    1. Have elevated blood volume
    2. Exhibit hyponatria
    3. **Urinate excessively**
    4. Drink less water
    5. All of the above
26. Vasopressin release is induced by which stimuli?
    1. Elevated salt concentrations, sensed in the carotid sinus
    2. Elevated blood volume, sensed in the carotid sinus
    3. Reduced salt concentrations, sensed in the carotid sinus
    4. **Reduced blood volume, sensed in the carotid sinus**
    5. All of the above
27. Which hormonal deficiency would cause diabetes insipidus?
    1. Growth hormone deficiency
    2. Somatostatin deficiency
    3. Aldosterone deficiency
    4. **Vasopressin deficiency**
    5. None of the above
28. How does oxytocin modulate lactation?
    1. Promotes the synthesis of milk in the mammary glands
    2. Inhibits the synthesis of milk in the mammary glands
    3. **Promotes the vasoconstriction of mammary gland blood vessels**
    4. Inhibits the vasoconstriction of mammary gland blood vessels
    5. All of the above
29. What is the mechanism by which oxytocin results in fetal delivery?
    1. Induces the let-down reflex in the mammary gland
    2. **Causes uterine contractions**
    3. Uterine contractions reduce oxytocin levels
    4. Negative feedback from the uterus to the hypothalamus
    5. All of the above
30. Which hormone is the most important for growth during the first year?
    1. **Insulin**
    2. Growth Hormone
    3. Sex Hormones
    4. Vitamin D
    5. Thyroid Hormones
31. Which factors **do not** induce growth hormone secretion?
    1. GHRH Levels
    2. Thyroid Hormones
    3. Testosterone
    4. Estrogen
    5. **IGF-1**
32. Which function of GH **can not** be restored by IGF-1
    1. Induction of bone growth
    2. Induction of muscle growth
    3. **Induction of lipolysis**
    4. Negative feedback to GH production
    5. All of the above can be restored by IGF-1
33. A patient that has mutations in the IGF-1 receptor would be expected to have which phenotype?
    1. **Increased lipolysis**
    2. Reduced GH levels
    3. Reduced IGF-1
    4. Accelerated muscle growth
    5. All of the above
34. The pubertal growth spurt requires which hormonal signaling events?
    1. Sex hormones
    2. Growth hormone
    3. Thyroid hormones
    4. Vitamin D
    5. **All of the above**
35. GH levels are highest at what time?
    1. Daytime, in young people
    2. **Nighttime, in young people**
    3. Daytime, in older people
    4. Nighttime, in older people
    5. Growth hormone levels do not change with age or time of day
36. Which hormone is released from the adrenal medulla?
    1. **Adrenaline**
    2. Cortisol
    3. Parathyroid hormone
    4. Testosterone
    5. Aldosterone
37. Cortisol is released from which part of the adrenal gland?
    1. Adrenal medulla
    2. **Zona Fasciculata**
    3. Zona Glomerulosa
    4. L-Cells
    5. Beta Cells
38. What is the primary role of aldosterone?
    1. **Accelerate salt reuptake in the kidney**
    2. Reduce salt reuptake in the kidney
    3. Accelerate water reuptake in the kidney
    4. Reduce water reuptake in the kidney
    5. Provide blood glucose for the brain
39. What hormone induces the synthesis of aldosterone?
    1. **Angiotensin II**
    2. Renin
    3. ACTH
    4. Vasopressin
    5. Epinephrine
40. Where is aldosterone synthesized?
    1. Juxtaglomerular cells
    2. Adrenal medulla
    3. **Adrenal cortex**
    4. Liver
    5. Collecting ducts of the kidney
41. What is the primary goal of glucocorticoid function?
    1. **Make blood glucose available for the brain**
    2. Make blood glucose available for the muscles
    3. Make amino acids available for the brain
    4. Make amino acids available for the muscle
    5. None of the above
42. How do glucocorticoids regulate blood glucose levels?
    1. Promoting glucose uptake into muscle
    2. **Induce liver gluconeogenesis**
    3. Inhibiting lipolysis
    4. Inhibit glycogenolysis in the liver
    5. Inhibiting liver gluconeogenesis
43. Which of the following is a factor in why Cushing’s patients often have hyperglycemia
    1. Accelerated insulin-stimulated glucose uptake
    2. **Elevated gluconeogenesis**
    3. Reduced glycogenolysis
    4. Increased salt reuptake
    5. All of the above
44. What is the major mechanism by which glucocorticoids regulate gluconeogenesis?
    1. Intracellular trafficking of GLUT4
    2. **Synthesis of proteins involved in gluconeogenesis**
    3. Post-translational activation of proteins involved in gluconeogenesis
    4. Stimulated glucose uptake in the liver
    5. All of the above
45. What is the functional purpose of glucocorticoid-induced muscle degeneration?
    1. To improve muscle strength
    2. **To provide substrates for hepatic gluconeogenesis**
    3. To provide amino acids to the brain
    4. To utilize glucose in the muscle
    5. All of the above
46. Congenital adrenal hyperplasia is characterized by the following and why:
    1. Larger adrenal gland, due to enhanced upstream signaling but impaired hormone production
    2. **Larger adrenal gland due to decreased upstream signaling but impaired hormone production**
    3. Larger adrenal gland due to enhanced upstream signaling but accelerated hormone production
    4. Larger adrenal gland due to decreased upstream signaling but accelerated hormone production
    5. None of the above
47. What is an Addisonian crisis?
    1. The destruction of an adrenal gland, resulting in impaired aldosterone release, characterized by hypoglycemia
    2. **The destruction of an adrenal gland, resulting in impaired stress-induced glucocorticoid release, characterized by hypoglycemia**
    3. The destruction of an adrenal gland, resulting in impaired stress-induced glucocorticoid release, characterized by hyper
    4. The destruction of pancreatic islets, characterized by hyperglycemia
    5. None of the above
48. What is the cause of Cushing’s disease?
    1. **A tumor of pituitary which causes elevated secretion of ACTH**
    2. A tumor of the adrenal gland which causes elevated production of aldosterone
    3. A lack of sensitivity to glucocorticoids
    4. Immune destruction of the adrenal medulla
    5. A hereditary loss of the glucocorticoid receptor
49. Hypersecretion of aldosterone would lead to which phenotypes:
    1. Hypopigmentation
    2. **Hypernatria**
    3. Decreased blood pressure
    4. Upregulation of Angiotensin II levels
    5. Hypoglycemia
50. With respect to noradrenaline and adrenaline, which statement is true
    1. Both function peripherally under normal physiological conditions
    2. Only noradrenaline functions peripherally under normal conditions
    3. **Only adrenaline functions peripherally under normal conditions**
    4. Pheochromocytomas typically cause release of only adrenaline
    5. Neither are functional under normal conditions
51. In what ways are adrenaline and cortisol similar?
    1. Both promote glucose utilization in muscle
    2. **Both induce gluconeogenesis in the liver**
    3. Both cause peripheral insulin resistance
    4. Both are released from the adrenal medulla
    5. Both are steroid hormones
52. What is the major kinase that mediates adrenaline action?
    1. **PKA**
    2. Akt
    3. Insulin Receptor
    4. PFK-2
    5. ACTH
53. Pheochromocytomas would do what to insulin release
    1. Increase it, due to increased synthesis of cortisol
    2. Decrease it, due to increased synthesis of cortisol
    3. Increase it, due to increased release of adrenaline
    4. **Decrease it, due to increased release of adrenaline**
    5. A pheochromocytoma would have no effects on insulin release
54. What **is not** characteristic of a pheochromocytoma?
    1. Elevated heart rate
    2. **Decreased gluconeogenesis**
    3. Increased glycogenolysis
    4. Increased GI tract vasoconstriction
    5. Suppressed insulin secretion
55. What role does Ghrelin play in appetite?
    1. It is released when the gut is empty, increasing appetite
    2. It is released when the gut is full, decreasing appetite
    3. **It is released when the gut is empty, increasing appetite**
    4. It is released when the gut is full, decreasing appetite
    5. Ghrelin does not regulate appetite
56. Which hormone would be a useful potential therapy for an anorexic patient?
    1. Leptin
    2. Insulin
    3. Aldosterone
    4. **Ghrelin**
    5. PYY
57. Which hormone increases appetite?
    1. Leptin
    2. Insulin
    3. Vasopressin
    4. **Ghrelin**
    5. PYY
58. What is **not a** role of the POMC/AgRP circuit in feeding?
    1. Integrate higher order brain signals with peripheral hormone levels
    2. Respond to peripheral signals and pass information to higher order centers of the brain
    3. **Secrete appetite-modulating hormones**
    4. Respond to circadian neural circuits to modulate appetite
    5. The POMC/AgRP circuit does not regulate feeding
59. If AgRP neuronal firing is inhibited what would happen?
    1. Appetite would be increased
    2. **Appetite would be decreased**
    3. Appetite would be unaffected
    4. All of the above
    5. None of a-c
60. What causes elevated leptin release?
    1. Hypoglycemia
    2. Hyperglycemia
    3. Increased blood pressure
    4. **Elevated fat mass**
    5. Increased appetite
61. Why is leptin ineffective for most obese patients?
    1. Patients are insulin resistant
    2. **Patients are hyperleptinemic and leptin resistant**
    3. Patients are hypoleptinemic and leptin resistant
    4. Obese patients have reduced fat mass
    5. Obese patients are hyperglycemic
62. What hormone released from the hyphalamus mediates the hedonistic response to food?
    1. Alpha-MSH
    2. ACTH
    3. **Beta-endorphin**
    4. Gamma-MSH
    5. Insulin
63. How would a leptin mutant patient be treated differently than a “normal” obese patient?
    1. **Leptin would be effective, in contrast to most obese patients**
    2. Leptin would be effective, consistent with most obese patients
    3. Insulin would be effective, in contrast to most obese patients
    4. Insulin would be effective, consistent with most obese patients
    5. They would respond to treatment identically
64. How could a patient develop obesity due to PYY deficiencies?
    1. Impaired mechanosensation at the colon
    2. Increased appetite
    3. Congenic mutations in the gene which encodes for PYY
    4. Negative feedback to the PYY receptor
    5. **All of the above**
65. Which hormone(s) are released from pancreatic alpha cells?
    1. **Glucagon**
    2. Insulin
    3. Somatostatin
    4. Vasopressin
    5. All of the above
66. How does the parasympathetic nervous system affect insulin release?
    1. **Induces insulin release via acetylcholine release**
    2. Prevents insulin release via acetylcholine release
    3. Induces insulin release via noradrenaline/adrenaline release
    4. Prevents insulin release via noradrenaline/adrenaline release
    5. They do not regulate insulin release
67. What is the major target tissue of glucagaon?
    1. **Liver**
    2. Adipose
    3. GI Tract
    4. Muscle
    5. Brain
68. What factor **is not** elevated in response to prolonged hypoglycemia
    1. Glucagon
    2. Aldosterone
    3. Growth Hormone
    4. **Insulin**
    5. Cortisol
69. Under what conditions are **both** insulin and glucagon release inhibited
    1. Hypoglycemia
    2. Exercise
    3. **Somatostatin release**
    4. Stress
    5. Hypertension
70. Which tissue(s) have insulin stimulated glucose uptake?
    1. Liver
    2. Kidneys
    3. **Adipose**
    4. Brain
    5. All of the above
71. When glucose enters a liver, adipose or muscle cell what is the mechanism?
    1. Active transport
    2. **Passive transport**
    3. Co-transport
    4. Antiporters
    5. Neurosecretion
72. What is the primary protein kinase that mediates insulin action?
    1. **Akt**
    2. PKA
    3. Glucagon
    4. GRK
    5. ACTH
73. During an oral glucose tolerance test, at peak glucose what is happening?
    1. Insulin levels are low, glucagon levels are low
    2. Insulin levels are low, glucagon levels are high
    3. **Insulin levels are high, glucagon levels are low**
    4. Insulin levels are high, glucagon levels are high
    5. Insulin levels are high, glucagon levels are unchanged
74. What would be an appropriate treatment for a patient who is hypoglycemic
    1. Adrenaline
    2. Aldosterone
    3. **Glucagon**
    4. Insulin
    5. All of the above
75. Under starvation conditions, what order are nutrients consumed?
    1. Fat then glucose then glycogen
    2. Glycogen then fat then glucose
    3. Fat then glycogen then glucose
    4. Glycogen then glucose then fat
    5. **Glucose then glycogen then fat**
76. The induction of glucose production in the liver by epinephrine and glucagon…
    1. Uses the same receptors and the same downstream signaling mechanisms
    2. **Uses different receptors but the same downstream signaling mechanisms**
    3. Uses the same receptors but different downstream signaling mechanisms
    4. Uses different receptors and different downstream signaling mechanisms
    5. Glucose production is not regulated by epinephrine and glucagon
77. Insulin promotes which of the following?
    1. **Glucose uptake into muscle and fat**
    2. Elevated Gluconeogenesis
    3. Glycogen breakdown
    4. Lipolysis
    5. All of the above
78. Type II diabetes is characterized by?
    1. **Obesity and insulin resistance**
    2. Obesity and insulin sensitivity
    3. Lean body and insulin resistance
    4. Lean body and insulin sensitivity
    5. Immune destruction of pancreatic beta cells
79. Why is insulin an ineffective therapy for type II diabetics?
    1. **It will alleviate hyperglycemia but not obesity**
    2. It will alleviate obesity but not hyperglycemia
    3. It will cause hyperglycemia
    4. It will reduce weight gain
    5. It will cause increased appetite
80. If a patient had a glucagon deficiency what would **not be** expected?
    1. Risk of hypoglycemia
    2. Elevated insulin levels
    3. Hypertension
    4. Increased gluconeogenesis
    5. **Hypernatria**
81. Which hormone responds fastest to hypoglycemia?
    1. Insulin
    2. Thyroid hormone
    3. Cortisol
    4. **Glucagon**
    5. Growth hormone