1) In an animal with type I diabetes describe the levels of pancreatic hormones in circulation

  A. Insulin low, glucagon low
* B. Insulin low, glucagon high (high glucagon:insulin ratio)
  C. Insulin high, glucagon low (low glucagon:insulin ratio)
  D. Insulin high, glucagon high

2) In an animal with type I diabetes, how do pancreatic hormones in the blood stream impact adipocytes

  A. No impact. Insulin is low, so glucagon will also be low.
* B. The elevated glucagon:insulin ratio would activate hormone-sensitive lipase to break down triglycerides into LCFA and glycerol
  C. The elevated glucagon:insulin ratio would de-activate hormone-sensitive lipase inhibiting break down of triglycerides into LCFA and glycerol
  D. The elevated glucagon:insulin ratio would activate hormone-sensitive lipase inhibiting the creation of ketone bodies

3) The following are some of the molecules absorbed by ruminants following carbohydrate digestion (multiple answers)

* A. Acetate
* B. Butyrate
  C. LCFA
* D. Propionate
  E. Glucose

4) When propionate is absorbed by the ruminant, it gets used for

  A. creation of ketones
* B. gluconeogenesis
  C. creation of LCFAs
  D. glycogenolysis
  E. glycolysis

5) When butyrate is absorbed by the ruminant, it gets used for

  A. creation of LCFAs
  B. gluconeogenesis
  C. glycolysis
  D. glycogenolysis
* E. creation of ketones

6) When acetate is absorbed by the ruminant, it gets used for

* A. creation of LCFAs
  B. gluconeogenesis
  C. glycolysis
  D. glycogenolysis
  E. creation of ketones

7) Cytokine release from macrophages/monocytes initiate the acute phase protein response?

* A. True
  B. False

8) Where are acute phase proteins produced

  A. Kidney
  B. Spleen
  C. Blood stream, by Monocytes
* D. Liver
  E. Blood stream, by Macrophages

9) Gluconeogenesis is the creation of glucose from glycogen

  A. True
* B. False

10) Glycogenolysis primarily occurs in tissue cells of the body

* A. False
  B. True

11) What function(s) can albumin/globulin ratio represent (single answer)?

  A. Immune activity
  B. Renal function
  C. Protein metabolism
  D. Inflammation
* E. All of the above

12) What effect does dehydration have on the A/G ratio

  A. Hyperglobulinemia
  B. Decreases concentration of albumin and globulin equally
* C. No effect
  D. Hypoalbuminemia

13) Transamination is a process in which

  A. Alpha-ketoglutarate donates its amine group to an amino acid, like glutamate
  B. An amine group is removed from a molecule and sent to the urea cycle
* C. An amine group is transferred from an amino-acid to an alpha-keto acid
  D. A protein is broken down into its amino-acids
  E. An amine group is transferred from an alpha-keto acid to an amino-acid

14) Deamination is a process in which

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15) Aspartate aminotransferase is an enzyme that catalyzes

  A. Deamination
  B. Transamination or Deamination, depending on the amino acid
* C. Transamination
  D. The Urea cycle

16) Ammonia can be recycled into protein

  A. through transamination
  B. through deamination
* C. by microorganisms
  D. in the urea cycle
  E. by oxidative phosphorylation

17) Transamination and deamination of proteins in the liver is

  A. The first step in the creation of plasma proteins
  B. To get rid of toxins (like ammonia) through the urea cycle
  C. To conjugate Bilirubin
* D. To catabolize excess amino acids

18) When protein is catabolized in muscle, toxic ammonia is removed as follows

  A. Transamination or Deamination, depending on the amino acid
* B. Ammonia reacts with glutamate to produce glutamine. This is broken down in the kidney, where ammonia is excreted in urine.
  C. Deamination of ammonia
  D. Ammonia diffuses into the blood and is taken to the liver where it is converted into urea

19) A high BUN (Blood Urea Nitrogen) points to a malfunction in :

  A. Spleen
  B. TCA cycle
* C. Kidney
  D. Gall bladder (obstruction)
  E. Liver

20) Birds excrete ammonia using uric acid while animals always excrete ammonia as urea or ammonia dissolved in urea.

  A. True
* B. False

21) The liver is believed to have over 500 functions. In most healthy animals the liver is operating at approximately what percentage of its maximum potential?

  A. 120 (like most crocodiles)
  B. 10
  C. 50
* D. 30
  E. 75

22) The parenchymal cell of the liver is the hepatocyte. Along with endothelial cells that line sinusoids, they constitute approximately what % of cells belonging to the liver?

* A. 95-98%
  B. less than 50%
  C. 60%
  D. 80%

23) Periportal hepatocytes

  A. Tend to have anaerobic functions because they reside close to the central venule
* B. Tend to have aerobic functions as they reside close to the hepatic arteriole and portal venule
  C. Tend to have anaerobic functions as they contain a biliary pole
  D. Tend to have aerobic functions as they contain a vascular pole

24) Cholestrol is present in every animal cell. It also is required for the production of bile salts, steroid hormone synthesis, cell membranes, myelin and lipoproteins. Its production is regulated by which enzyme

  A. HMG-COA dehydrogenase
  B. Cholestrol aminotransferase
* C. HMG-COA reductase
  D. Cholestro-transferase

25) Regulation of cholestrol synthesis is carried out by

* A. By controlling both the activity and levels of HMG CoA Reductase
  B. By controlling the levels of HMG Coa Reductase
  C. By controlling the activity of HMG Coa Reductase
  D. Synthesis isn't regulated. Instead, excess is excreted by the kidney

26) Most of the cholestrol used to create bile

  A. Facilitates the digestion of protein
  B. Is lost in the feces
  C. Is used to facilitate the excretion of bilirubin
* D. Is reabsorbed in the ileum

27) A portosystemic shunt

  A. Is a bile duct blockage
* B. Occurs when part of the portal system bypasses the liver
  C. Results in reduced bile secretion into the intestine
  D. Is usually the result of severe trauma to the abdomen

28) Cholestasis is

  A. Reduced production of bile due to liver failure
* B. Blockage of the flow of bile from the liver to the intestine
  C. Excessive production of cholestrol
  D. Reduced synthesis of cholestrol

29) Bilirubin is formed by the breakdown of senescent RBCs in the

  A. Spleen, Liver and Kidney
  B. Liver only
  C. Spleen only
* D. Reticuloendothelial system

30) Diazo dye detects

* A. Conjugated bilirubin because it is soluble
  B. Unconjugated bilirubin because it is insoluble
  C. Unconjugated bilirubin because it is soluble
  D. Conjugated bilirubin because it is insoluble

31) Bilirubin, in a healthy animal

  A. Is normally present in small quantities in urine
* B. Is not normally present in urine
  C. Is never present in blood serum
  D. If unconjugated, being a smaller molecule, will pass through the glomerulus
  E. If conjugated, will not pass through the glomerulus

32) The brownish color of feces is due to

* A. Stercobilin
  B. Unconjugated bilirubin
  C. Conjugated bilirubin
  D. Urobilinogen

33) Under conditions of hepatic lipidosis, a blood test could show the following

  A. AST, ALT, Albumin normal; Bile acids higher than normal; Bilirubin lower than normal
* B. AST, ALT, Bilirubin and bile acids higher than normal; Albumin lower than normal
  C. AST, ALT normal; Bile acids, Bilirubin higher than normal; Albumin lower than normal
  D. AST, ALT, Albumin and bile acids higher than normal; Bilirubin lower than normal

34) Peptides are broken down into free amino acids and di/tripeptides at the level of the

* A. membrane of the small intestine
  B. lumen of the small intestine
  C. membrane of the stomach
  D. lumen of the stomach

35) Proteins can only be taken up by enterocytes in the form of amino acids

* A. False
  B. True

36) Which of the following statements is true”

A. The stomach is the main site of protein digestion, gastric enzymes work at high pH
B. The stomach is the main site of protein digestion, gastric enzymes work in neutral pH
C. The small intestine is the main site of protein digestion, pancreatic proteolytic enzymes work at low pH
* D. The small intestine is the main site of protein digestion, pancreatic proteolytic enzymes work at neutral pH

37) Which of the following enzymes are found only in the small intestine?

A. pepsin
B. chymosin (rennin)
* C. trypsin
D. intestinogen

38) Which of the following is true concerning di/tripeptides and amino acids in the adult gut lumen-enterocyte interface

A. they are actively transported by chloride transporters
B. they are cotransported with bicarbonate
* C. they are cotransported with sodium
D. they are absorbed by pinocytosis

39) Which of the following is true regarding carbohydrate and protein digestion in the intestine?

A. Carbohydrates can be taken up as di/trisaccharides and broken down into glucose within the enterocyte
B. Both carbohydrates and proteins must be broken down to their basic building blocks (glucose and amino acid respectively) before they can be absorbed
C. Proteins must be absorbed only as amino acids whereas carbohydrates can be taken up as disaccharides or glucose
* D. Carbohydrates must be absorbed only as simple sugars whereas proteins can be taken up as di/tripeptides and amino acids

40) Mammals can never absorb large peptides through the gut

A. True
* B. False

41) The acute phase responder protein in horse and cows during an inflammation is:

* A. Fibrinogen
B. Globulin
C. Enterokinase
D. Albumin

42) Relative hyperproteinemia refers to

  A. increase in albumin only
  B. increase in fibrinogen only
  C. increase in globulin only
  D. increase in the A/G ratio
* E. none of the above