

Modesto Junior College
FDNTR 219 - NUTRITION
EXAM 4

Identify the selection which best answers each of the following statements. Record your response on the answer sheet.

1. Most of the digestive and absorptive processes occur in the:
 - a. mouth
 - b. stomach
 - c. small intestine
 - d. colon

2. If the carbohydrate content of the diet is insufficient to meet the body's needs for glucose, which of the following **can** be converted to glucose? (think of the carbon units)
 - a. Fatty acids
 - b. Acetyl CoA
 - c. Amino acids
 - d. Carbon dioxide

3. Glucose is stored in muscle tissue as:
 - a. triglycerides
 - b. glycogen
 - c. protein
 - d. phosphocreatine

4. Which of the following is the only substrate that can directly obtain energy in the **absence** of oxygen?
 - a. fatty acids
 - b. glucose
 - c. ketones
 - d. alcohol
 - e. amino acids

5. Short term storage of glucose occurs:
 - a. in the liver
 - b. in the muscle
 - c. in adipose tissues
 - d. nowhere in the body. We can't store glucose
 - e. both a and b

6. "Active" absorption:
 - a. allows nutrients to flow from a higher concentration to a lower concentration
 - b. involves a carrier molecule to move nutrients from outside to inside a cell
 - c. is a process involving phagocytosis or pinocytosis
 - d. requires the input of energy (ATP) and a carrier protein to move nutrients across a concentration gradient.

7. Which of the following dietary components **cannot** be used to synthesize and store glycogen? (think of carbon units)
 - a. Lactose
 - b. Animal fats
 - c. Wheat starch
 - d. Plant protein

8. The common pathway for the oxidation (metabolism) of products of glucose and fatty acid catabolism (breakdown) is:
 - a. glycolysis
 - b. gluconeogenesis
 - c. the TCA cycle or Krebs cycle or Citric Acid Cycle

9. After a period of prolonged fasting (starving), brain and nerve tissue changes its fuel requirements:
- and uses amino acids directly
 - so that glycerol becomes the primary source of energy
 - so that ketone bodies provide energy
 - and glycogen becomes the primary source of energy
10. The energy in our food is released by metabolic pathways and transferred to _____ for future use.
- ATP
 - oxygen
 - NH₃ (ammonia)
 - hydrogen
11. The energy of ATP may be derived from:
- carbohydrates
 - proteins
 - fats
 - all of the above
12. Anaerobic glycolysis is:
- the breakdown of glucose to pyruvate
 - the transfer of hydrogen to NAD
 - the formation of acetyl-CoA
13. Peristalsis refers to:
- mastication and dentation
 - the opening and closing of the ileocecal valve
 - contraction and relaxation of digestive tract muscles
 - the action of bile on dietary fat
14. A severe deficiency of all the B vitamins contributes to fatigue by:
- inability to provide co-enzymes for metabolic functions
 - decreased level of NAD and FAD to carry electrons for synthesis of ATP
 - limiting calories
 - a and b
 - b and c
15. Interference with the digestion of sugars (maltose, lactose and sucrose):
- prevents their absorption
 - allows their entry into the colon
 - promotes the production of gas by intestinal bacteria
 - causes abdominal discomfort
 - all of the above
16. Individuals who have their gallbladder removed can still digest fat because:
- a thick layer of mucus coats the lining of the stomach
 - pancreatic juices break down the fat
 - the liver continuously secretes bile
17. The only fuel that can be used in anaerobic glycolysis is:
- fatty acids
 - amino acids
 - alcohol
 - glucose
18. Villi:
- are finger like projections in the small intestine which facilitates absorption
 - are one of several kinds of lipoproteins
 - are formed in the walls of the small intestine
 - facilitate the release of the hormone gastrin

19. The lymphatic system:
- is like blood, since it contains mostly red blood cells
 - is a fluid containing white blood cells
 - recycles nutrients between the liver and the small intestine
 - transports fat soluble particles from the intestinal tract to the general circulation
20. What is MEOS?
- An advanced liver disorder
 - A drug that inhibits alcohol absorption
 - A waste product of alcohol metabolism
 - A system of enzymes that oxidizes alcohol and drugs
21. Which of the following plays a major role in regulating the elimination of alcohol from the body?
- Lung respiratory rate
 - Kidney antidiuretic hormone
 - Liver alcohol dehydrogenase enzyme
 - Brain acetaldehyde dehydrogenase enzyme
22. The portal vein delivers nutrients from the digestive tract to the:
- heart
 - liver
 - kidneys
 - lungs
 - lymphatic system
23. An important form of energy used by most cells is:
- NAD
 - FAD
 - TCA
 - ATP
24. Metabolism is regulated by:
- hormones such as insulin
 - presence and activity of enzymes
 - ATP levels in individual cells
 - all of the above
25. When glucose is split in half, it yield two molecules of:
- acetate
 - glycerol
 - pyruvate
 - water
 - monosaccharides
26. The part (s) of triglycerides that can be made into glucose is (are):
- short chain fatty acids
 - medium chain fatty acids
 - long chain fatty acids
 - all fatty acids
 - glycerol
27. Three carbon glucose units are able to form glucose:
- true
 - false
28. Which of the following dietary nutrients would most **rapidly** reverse a state of ketosis in a starving person?
- Fat
 - Protein
 - Amino acids
 - Carbohydrate

29. The stomach is protected from digesting itself by producing:
- a thick layer of mucus to coat the lining of the stomach
 - hydroxyl ions to neutralize the acid
 - antipepsin that destroys digestive substances
 - a and b
30. All blood leaving the GI tract travels first to the:
- heart
 - liver
 - kidneys
 - pancreas
31. Maltase, sucrase, and lactase are produced:
- in the pancreas
 - in the lumen of the small intestine
 - from bile and pancreatic juice
32. Before protein becomes an energy source, the _____ must be removed from the molecule.
- H₂O (water)
 - NH₂ (amino groups; nitrogen)
 - CO₂ (carbon dioxide)
33. Excess consumption of protein causes:
- increase in muscle mass
 - fats to burn more efficiently
 - weight gain as amino acids are repackaged as triglycerides and stored in adipose tissue
34. Fatty acids **cannot** be converted to glucose because:
- they lack sufficient energy
 - as acetyl-CoA they enter the Krebs cycle and can never reform pyruvate
 - acetyl-CoA can be synthesized only from amino acid skeletons, not fatty acid skeletons
 - they contain 2 carbon units
35. Which of the following outlines the overall **sequence of events** in the complete **oxidation of glucose**?
- Cori cycle, TCA cycle, glycolysis
 - Glycolysis, TCA cycle, electron transport chain
 - Electron transport chain, TCA cycle, Cori cycle
 - TCA cycle, electron transport chain, glycolysis
36. Lillie has been losing weight by following a very-low-carbohydrate diet for 2 months. Her primary care physician just diagnosed ketosis through a urine sample. Which of the following symptoms would be another way the physician might have suspected **ketosis** in Lillie?
- Thinning hair
 - Irritable temper
 - Fishy body odor
 - Fruity odor on breath
37. In addition to ATP, the **end products** of the complete oxidation (breakdown) of fatty acids are:
- carbon and hydrogen
 - water and carbon dioxide
 - urea and water
 - acetyl CoA
38. Red blood cells have no mitochondria, therefore they must rely on _____ as their only energy yielding substrate
- amino acids
 - glycogen
 - fatty acids
 - glucose

39. In the average healthy person, about how much time is required by the liver to process the alcohol in a typical drink?
- 15 minutes
 - 30 minutes
 - 1 hour
 - 2 hours
40. Digestion and absorption are coordinated by:
- hormones, enzymes and nervous system
 - pancreas and kidney
 - liver and gallbladder
 - vascular and lymphatic system
41. Describe the metabolic adaptations and consequences that occur during periods of fasting/starvation. Remember to discuss the effects of a decrease of **all** the macronutrients along with alternate energy sources, etc. (6 points)
42. In reference to the metabolism of the macronutrients, state an example of both a catabolic reaction and an anabolic reaction (2 points)
43. Describe what is meant by the U-shaped curve in regards to the consumption of alcohol and name 2 benefits of moderate alcohol consumption (2 point)

Bonus Questions (5 points)

Describe the digestion, absorption, and metabolism of Dillon O'Malley's typical St. Patrick's day feast: corned beef, cabbage, potatoes, and 1 pint of Guinness.