Review for Unit Test: The Digestive System

1. Know the meaning of these terms:

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
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<tbody>
<tr>
<td>heterotrophs</td>
<td>digestion</td>
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<tr>
<td>autotrophs</td>
<td>chemical digestion</td>
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<tr>
<td>intracellular digestion</td>
<td>mechanical (physical) digestion</td>
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<tr>
<td>extracellular digestion</td>
<td>absorption</td>
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<tr>
<td>pouch digestive system</td>
<td>egestion</td>
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<tr>
<td>tube digestive system</td>
<td>bolus</td>
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<tr>
<td>digestion</td>
<td>peristalsis</td>
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<tr>
<td>peristalsis</td>
<td>chyme</td>
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<tr>
<td>microvilli</td>
<td>enzymes</td>
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<td>nutrients</td>
<td>nutrients</td>
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<td>lacteal</td>
<td>sphincter</td>
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<td>macromolecule</td>
<td>enzyme</td>
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<td>nutrients</td>
<td>villi</td>
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<td>substrate</td>
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2. Know the location and function of the following parts of the human digestive system:

<table>
<thead>
<tr>
<th>Part</th>
<th>Location and Function</th>
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<tbody>
<tr>
<td>salivary glands</td>
<td>cardiac sphincter</td>
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<tr>
<td>pharynx</td>
<td>duodenum</td>
</tr>
<tr>
<td>esophagus</td>
<td>caecum</td>
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<tr>
<td>epiglottis</td>
<td>pancreas</td>
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<tr>
<td>stomach</td>
<td>jejunum</td>
</tr>
<tr>
<td>stomach</td>
<td>ileum</td>
</tr>
<tr>
<td>stomach</td>
<td>ileocaecal valve</td>
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<tr>
<td>stomach</td>
<td>anus</td>
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</table>

3. Know the secretions that are involved in digestion, including where they are made, where they act and what each secretion does:

<table>
<thead>
<tr>
<th>Secretion</th>
<th>Made</th>
<th>Acted</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>saliva</td>
<td>hydrochloric acid (HCl)</td>
<td>sodium bicarbonate</td>
<td>bile</td>
</tr>
<tr>
<td>mucus (mucin)</td>
<td>gastric enzymes</td>
<td>pancreatic enzymes</td>
<td>intestinal enzymes</td>
</tr>
</tbody>
</table>

4. Know the macromolecules and their subunits, including:

a) proteins
b) triglycerides (fats and oils)
c) three different polysaccharides and their subunits
d) three different monosaccharides
e) three different disaccharides

5. Review the chemical tests for starch, simple sugars, proteins and fats. What indicators are used for each? Describe the appearance of a positive result.

6. How is the digestive system of an earthworm superior to that of a Cnidaria (jellyfish or sea anemone)?

7. Compare and contrast:

a) intracellular and extracellular digestion
b) mechanical (physical) and chemical digestion
c) the large intestine and the small intestine
d) ingestion and digestion
e) the trachea and the esophagus

8. Be able to label a diagram of an earthworm. Know the function of each of the major parts of the earthworm.

9. Know the six types of nutrients required by the human body. For each nutrient:

a) state whether or not it needs to be digested in order to be absorbed
b) if it is digested, what are its breakdown products (subunits)

10. Fibre is known as the “essential non-nutrient”. Why is fibre important for good health?

11. Review the material from the “Introduction to Nutrients” question page. Some of this material is review from our first unit on macromolecules. Know the function(s) of:

a) two minerals
b) two vitamins
c) proteins (know 4 functions)
d) lipids (know 4 functions of fats and 4 functions of cholesterol) and
e) carbohydrates (know one function in animals)

12. Review the function of enzymes and how they work.

a) What is the role of enzymes in digestion?
b) What factors affect how well an enzyme functions?
13. Mucus has different functions in different parts of the body. What is the function of mucus in the esophagus and the stomach?

14. Pathogens may enter the digestive system along with food and water.
a) What enzyme is found in saliva that kills bacteria in the mouth?
b) What secretion(s) of the stomach kill bacteria?

15. What happens in the following disorders of the digestive system:
 a) gastric ulcers
 b) ‘heartburn’ (acid reflux aka GERD: gastroesophageal reflux disease)
 c) gallstones

16. Many aspects of digestion and absorption involve increasing surface area.
a) Give four specific examples of where/when surface area is increased to improve digestion or absorption.
b) Why is it so important to increase surface area?

17. A student has a plate of nachos for a snack after school. It has tortilla chips (fat and starch), chili (protein), cheese (fat and protein), onions and peppers (fiber).
a) Beginning in the mouth, describe all of the different locations and ways that physical and chemical digestion occur.
b) Describe where/how the subunits of digestion are absorbed and how wastes are eliminated.

18. Label the parts of the digestive system:
1. Autotrophs obtain their energy by:
   a) intracellular digestion of organic material
   b) extracellular digestion of organic material
   c) photosynthesis or metabolizing inorganic molecules
   d) decomposing organic materials

2. What happens to indigestible material after intracellular digestion has taken place?
   a) it passes out of the cell by endocytosis
   b) it is broken down by lysosomes
   c) it is released into the cytoplasm for destruction
   d) it passes out the cell by exocytosis

3. During embryonic development, a blastula forms. This is a:
   a) hollow ball of cells
   b) zygote
   c) miniature person in the head of a sperm cell
   d) folded-in group of cells with endoderm and ectoderm

4. The lining of the digestive system is formed by the:
   a) endoderm
   b) mesoderm
   c) ectoderm
   d) epidermis

5. During intracellular digestion, digestive enzymes are:
   a) secreted outside of the cell by exocytosis
   b) not necessary because the cell is an autotroph
   c) stored in lysosomes and released into food vacuoles
   d) released into the cytoplasm by the ribosomes

6. Which of the following are examples of intracellular digestion?
   I) white blood cells performing phagocytosis and destroying pathogens
   II) amoeba engulfing and digesting food
   III) a jellyfish taking food into its internal cavity for digestion
   IV) an earthworm digesting food in its gizzard
   a) I and II only
   b) III and IV only
   c) II and III only
   d) I, II, III and IV

7. Which of the following are examples of mechanical (physical) digestion?
   I) teeth chewing and grinding food
   II) peristalsis pushing food through the digestive tract
   III) stomach muscles ‘kneading’ and mixing food as it makes it into chyme
   IV) an earthworm’s gizzard grinding food with sand
   a) I and II only
   b) III and IV only
   c) II and III only
   d) I, III and IV only

8. Which combination(s) of enzymes and substrates is/are correct?
   a) pepsin breaks down protein
   b) lipase breaks down triglycerides
   c) amylase breaks down starch
   d) all of the above

9. Which of the following are examples of increasing surface area for digestion?
   I) teeth chewing and grinding food
   II) the stomach lining being folded into rugae
   III) bile emulsifying globules of fat into small droplets
   IV) villi and microvilli protruding into the middle (lumen) of the small intestine
   a) I and II only
   b) III and IV only
   c) I and III only
   d) I, II, III and IV

10. Which secretion(s) is/are correctly matched with their function?
    a) pancreatic juice neutralizes stomach acid
    b) gastric juice emulsifies large fat particles
    c) intestinal enzymes digest cellulose in humans
    d) all of the above are correct

11. Which of the following is/are functions of mucus?
    a) mucus in the nasal cavities traps dirt, bacteria and viruses as a non-specific first line of defense
    b) mucus in the esophagus provides lubrication to help the bolus move to the stomach more easily
    c) mucus in the stomach protects the stomach from being digested by stomach acid and enzymes
    d) all of the above
12. Peristalsis takes place in the:
   a) mouth       b) stomach       c) small intestine       d) all of the above

13. The major site of absorption of nutrients in humans is the:
   a) esophagus       b) stomach       c) duodenum       d) jejunum

14. Bile is made in the:
   a) gall bladder and secreted into the jejunum  
   c) liver and stored in the gall bladder
   b) gall bladder and used in the duodenum  
   d) stomach and activated in the duodenum

15. Which of the following are true about saliva?
   I) saliva contains lysozyme which kills bacteria in the mouth
   II) saliva contains amylase which begins chemical digestion of starch
   III) saliva moistens and lubricates food to make swallowing easier
   IV) saliva contains proteases which begin the chemical digestion of protein
   V) saliva contains lipases which begin the chemical digestion of fats
   a) II and III only  
   b) II, IV and V only  
   c) I, II and III only  
   d) I, II, III, IV and V

16. The finger-like projections that line the small intestine are called:
   a) pili  
   b) villi  
   c) pylori  
   d) lacteals

17. Heartburn is caused when stomach acid:
   a) gets into the blood vessels and damages the heart
   b) gets into the esophagus and damages its lining
   c) escapes from the stomach because the pyloric sphincter is weakened or ineffective
   d) digests the stomach wall when there is insufficient mucus protecting the stomach

18. The main nutrient absorbed in the large intestine is:
   a) water  
   b) fibre  
   c) starch  
   d) minerals

19. The structure which helps to prevent food or water from entering the trachea and lungs is the:
   a) uvula  
   b) epiglottis  
   c) pharynx  
   d) larynx

20. Which of the following is secreted into the stomach?
   a) secretin  
   b) chyme  
   c) pepsinogen (pepsin)  
   d) trypsin

21. Which of the following does NOT enter the duodenum?
   a) insulin  
   b) bile  
   c) lipase  
   d) chyme

22. Which of the following areas is/are NOT lined with mucus?
   a) esophagus  
   b) stomach  
   c) intestine  
   d) all have mucus

23. Which of the following are functions of the liver?
   I) makes vitamins for the whole body
   II) stores vitamins
   III) detoxifies harmful substances
   IV) stores glucose as glycogen
   V) stores bile
   VI) breaks down RBC and hemoglobin
   a) I, III and VI only  
   b) I, II, IV and V only  
   c) II, III, IV and VI only  
   d) I, II, III, IV, V & VI

24. Hydrolysis reactions:
   a) break down macromolecules into their subunits by removing water
   b) break down macromolecules into their subunits by adding water
   c) build up macromolecules from their subunits by removing water
   d) build up macromolecules from their subunits by adding water
25. Carbohydrates are important in living things because they:
   a) store energy
   b) are important building blocks to make enzymes, ribosomes and muscle fibers
   c) are the major structural component of cell membranes
   d) all of the above

26. Which of the following is NOT a function of cholesterol?
   a) it is used to make bile
   b) it is found in cell membranes
   c) it is used to make steroid hormones
   d) it is used to make bone

27. When fats are digested, they are broken down into:
   a) simple sugars
   b) amino acids
   c) glycerol and fatty acids
   d) steroid hormones

28. Which list includes only minerals?
   a) zinc, sodium and potassium
   b) calcium, cobalt and iron
   c) magnesium, iodine and chloride
   d) all of these are minerals

29. Minerals are:
   a) important in nerve transmission, muscle contraction and maintaining osmotic (water) balance
   b) organic molecules that can be absorbed without being digested
   c) required by the body in large amounts
   d) all of the above

30. Vitamins are:
   a) made in the body as needed
   b) required in relatively large amounts
   c) micronutrients
   d) all of the above

31. Proteins are used to make:
   a) enzymes such as lipase
   b) transport molecules such as hemoglobin
   c) structural body parts such as bone, hair and nails
   d) all of the above

32. Which of the following is NOT a part of the digestive system?
   a) intestines
   b) liver
   c) kidneys
   d) pancreas

33. Salivary amylase and pancreatic amylase are enzymes responsible for the chemical breakdown of:
   a) proteins
   b) carbohydrates
   c) lipids
   d) nucleic acids

34. Enzymes from the pancreas enter the digestive system just below the:
   a) cardiac sphincter
   b) pyloric sphincter
   c) ileocaecal valve
   d) epiglottis

35. The movement of digestion products, minerals, vitamins and water from the intestine into the blood and lymphatic vessels is called:
   a) absorption
   b) digestion
   c) egestion
   d) indigestion

36. Contraction of smooth muscle around the small intestine churns and mixes the chyme with intestinal secretions in addition to moving it along. This is called:
   a) rugae
   b) peristalsis
   c) egestion
   d) excretion

37. Which digestive organ mechanically and chemically transforms a food bolus into chyme?
   a) esophagus
   b) stomach
   c) small intestine
   d) large intestine

38. The folds that line the stomach are called:
   a) rugae
   b) pylori
   c) villi
   d) papillae

39. Beginning at the stomach, the correct order for the parts of the small intestine is:
   a) ileum, duodenum and jejunum
   b) duodenum, jejunum and ileum
   c) jejunum, ileum and duodenum
   d) duodenum, ileum and jejunum
40. Beginning at the ileocaecal valve, the correct order for the parts of the large intestine is:
   a) caecum, rectum and colon  c) colon, rectum and caecum
   b) rectum, caecum and colon  d) caecum, colon and rectum

41. The function of the villi in the small intestine is to:
   a) decrease the amount of exposed surface  c) increase the surface area for absorption
   b) help mix the digestive enzymes with chyme  d) move particles along with a sweeping motion

42. When food is swallowed, it moves through or past the:
   a) larynx, epiglottis and down the trachea  c) pharynx, then past the uvula and down the esophagus
   b) uvula, pharynx, epiglottis and then esophagus  d) epiglottis, cardiac sphincter and down the esophagus

43. The function of the tongue is to:
   a) moisten and lubricate food as it is chewed  c) physically digest food in preparation for swallowing
   b) increase the surface area of food  d) push food to the back of the mouth for swallowing

44. If the epiglottis does not function properly, what might happen?
   a) the person might choke  c) the person might vomit
   b) acid reflux will damage the esophagus  d) peristalsis can not take place

45. What macromolecule is used to store glucose in the liver?
   a) starch  b) amylose  c) cellulose  d) glycogen

46. Which standard test and nutrient are correctly paired?
   a) if starch is present, Biuret solution turns purple  c) if glucose is present, Benedict’s solution turns orange
   b) if protein is present, iodine solution turns black  d) if lipids are present, litmus turns red

47. The esophagus:
   a) connects the mouth to the stomach and has no function in chemical digestion
   b) secretes digestive enzymes as food passes from the mouth to the stomach
   c) secretes a thick layer of mucus to protect it from stomach acid and enzymes
   d) is the major site for chemical digestion and absorption of fats

48. The primary digestive function of the stomach is to:
   a) store, digest and absorb food nutrients  c) secrete HCl which is needed in the small intestine
   b) move food along by peristalsis  d) begin the break down of fats and proteins

49. Chemical digestion of food takes place in the:
   I) mouth
   II) esophagus
   III) stomach
   IV) small intestine
   V) large intestine
   a) I, II and III only  b) III, IV and V only  c) I, III and IV only  d) I, II, III, IV & V

50. The primary function of the small intestine is to:
   a) maintain constant levels of nutrients in the blood  c) pass indigestible waste from the body
   b) kill bacteria in food  d) digest and absorb nutrients

51. The pancreas is considered an accessory organ for the digestive system because it:
   a) secretes important digestive enzymes into the small intestine
   b) secretes bile into the small intestine
   c) helps to regulate the amount of water in the small intestine
   d) removes toxins that may have been absorbed from the food

52. The throat divides into the trachea and esophagus. What prevents food from entering the trachea?
   a) the uvula  b) the tongue  c) the larynx  d) the epiglottis
53. Bile is:
   a) produced in the gallbladder       c) an emulsifier to break fat into small droplets
   b) important in the digestion of proteins  d) all of the above

54. Villi, microvilli, and the folds of the small intestine all function to:
   a) prevent the intestine from digesting itself  c) secrete important enzymes
   b) provide crevices where bacteria can live  d) increase the surface area for absorption

55. Which of the following is NOT a function of the liver?
   a) to monitor glucose levels in the blood
   b) to digest food as it passes through the liver on the way to the large intestine
   c) to break down red blood cells when they get too old
   d) to aid in digestion by producing bile

56. The primary role of the large intestine is to:
   a) complete the breakdown of indigestible food
   b) absorb water and some minerals and vitamins
   c) maintain a sterile environment where no bacteria can grow
   d) secrete the enzyme lactose to break down lactase

57. Which of the following is/are function(s) of bacteria in the human digestive system?
   a) a healthy gut flora competes with pathogens to limit their growth
   b) bacteria produce vitamin B12 and vitamin K which are absorbed and used in the body
   c) bacteria help to reabsorb water from the large intestine
   d) all of the above

58. Which is the correct order that food travels through the digestive tract?
   a) mouth, pharynx, stomach, small intestine, large intestine and rectum
   b) mouth, esophagus, stomach, large intestine, small intestine and rectum
   c) mouth, stomach, esophagus, small intestine, large intestine and rectum
   d) mouth, stomach, pharynx, small intestine, large intestine and rectum

59. Which of the following does NOT manufacture digestive juices?
   a) liver  b) kidneys  c) stomach  d) pancreas

60. Which of the following enzymes is secreted by the stomach and what does it digest?
   a) trypsin, which digests protein  c) pepsin, which digests lipids
   b) trypsin, which digests starch  d) pepsin, which digests protein

61. Methanogens live in the human gut. They belong to:
   a) Domain Archaea, Kingdom Bacteria
   b) Domain Bacteria, Kingdom Archaea
   c) Domain Eukarya, Kingdom Protista
   d) Domain Archaea, Kingdom Archaea

62. Which of the following lists includes only disaccharides?
   a) lactase, maltase and sucrase
   b) glucose, fructose and galactose
   c) cellulose, amylose and mannose
   d) sucrose, lactose and maltose

Answers to multiple choice:

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<tbody>
<tr>
<td>1. c</td>
<td>11. d</td>
<td>21. a</td>
<td>31. d</td>
<td>41. c</td>
<td>51. a</td>
<td>61. d</td>
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<td>22. c</td>
<td>32. c</td>
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<td>53. c</td>
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