1. Some bloodsucking insects insert their mouthparts directly into a blood vessel and withdraw blood. Other bloodsucking insects have mouthparts that cut through the skin and blood vessels and produce a small pool of blood from which they feed. Both mouthpart types are specialized for

A) autotrophic nutrition
B) heterotrophic nutrition
C) regulation
D) excretion

2. Base your answer to the following question on The series of diagrams below represents a process carried out by a unicellular organism.

![Diagrams](image)

This process is known as

A) autotrophic nutrition  B) replication
C) sporulation  D) phagocytosis

3. All of the cell shapes shown in the diagrams below have the same volume. Which form could absorb nutrients most efficiently and quickly?

A)  
B)  
C)  
D)  

4. Two organisms are shown in the diagrams below.

![Diagrams](image)

In the diagram, what do the structures indicated by arrows help these organisms do?

A) carry out respiration
B) carry out photosynthesis
C) obtain food
D) excrete wastes
5. In the grasshopper and earthworm, the efficiency of food absorption is increased by the presence of
   A) a large stomach, which secretes hormones
   B) infolds, which add surface area to the digestive tube
   C) the pancreas, which secretes digestive enzymes into the intestine
   D) the liver, which absorbs excess sugar and stores it as glycogen

6. Which activity is illustrated in the diagram of an ameba shown below?
   ![Diagram of an ameba with small protists]
   A) egestion       B) synthesis
   C) respiration    D) ingestion

7. Which activity is illustrated in the diagram below?
   ![Diagram with a food particle being ingested]
   A) a virus destroying a cell by extracellular digestion
   B) a member of the bryophyte phylum performing intercellular digestion
   C) a protozoan ingesting food during heterotrophic nutrition
   D) a lysosome egesting a food particle into the cytoplasm

8. Which process can be performed by organism A but not by organism B?
   ![Diagram with a bird and a plant]
   A) mitotic cell division
   B) aerobic respiration
   C) transport of needed materials
   D) ingestion of organic molecules

9. A student has a hamburger, French fries, and soda for lunch. Which sequence represents the correct order of events in the nutritional processing of this food?
   ![Diagram of food processing]
   A) ingestion → digestion → absorption → egestion
   B) digestion → absorption → ingestion → egestion
   C) digestion → egestion → ingestion → absorption
   D) ingestion → absorption → digestion → egestion

10. An ameba accomplishes ingestion by means of
    A) rhizoids, which secrete hydrolytic enzymes
    B) cilia, which sweep food into the oral groove
    C) flagella, which move the organism toward food
    D) pseudopodia, which surround and engulf food

11. Base your answer to the following question on Which process is illustrated in the diagram below?
    ![Diagram showing food being ingested]
    A) egestion       B) ingestion
    C) synthesis      D) respiration

12. Which process is used by heterotrophs to obtain preformed organic molecules from the environment?
    A) ingestion
    B) egestion
    C) dehydration synthesis
    D) mechanical digestion

13. Which process is illustrated when certain insects use specialized mouth parts to suck plant juices?
    A) chemical digestion
    B) ingestion
    C) egestion
    D) mechanical digestion

14. The digestive systems of humans, grasshoppers, and earthworms are similar in that all three
    A) contain a tube-like system with two openings
    B) contain a long, coiled intestine
    C) mechanically break down food in a mouth cavity
    D) chemically digest food in Malpighian tubules
15. Which process increases the surface area of foods prior to chemical digestion?
   A) dehydration synthesis  
   B) excretion  
   C) mechanical digestion  
   D) diffusion

Base your answers to questions 16 through 18 on the diagram below and your knowledge of biology. The diagram represents an ameba, a single-celled organism, carrying out an essential life process.

16. Which two body systems allow humans to carry out the same life process as the ameba in the diagram?
   A) endocrine and immune  
   B) respiratory and reproductive  
   C) digestive and circulatory  
   D) nervous and excretory

17. This process is essential to the survival of the ameba because it
   A) provides materials used in cellular respiration  
   B) removes pathogens from the environment  
   C) supplies the raw materials for photosynthesis  
   D) protects the organism during development

18. This process represents a step in
   A) asexual reproduction  
   B) heterotrophic nutrition  
   C) photosynthesis  
   D) diffusion

19. Why is a mushroom considered a heterotroph?
   A) It manufactures its own food.  
   B) It divides by mitosis.  
   C) It transforms light energy into chemical energy.  
   D) It obtains nutrients from its environment.

20. Dodder is a creeping vine that is parasitic on other plants. Which characteristic does dodder share with all other heterотrophs?
   A) It produces nutrients by photosynthesis.  
   B) It must grow in bright locations.  
   C) It consumes preformed organic molecules.  
   D) It remains in one place for its entire life.

21. Which organisms are not able to make organic molecules from inorganic raw materials?
   A) mushrooms  
   B) algae  
   C) bryophytes  
   D) tracheophytes

22. Which statement correctly describes one characteristic of the tube-like digestive system of an earthworm?
   A) Various parts of the system perform different digestive functions.  
   B) The shape of the system allows food to be processed by intracellular digestion.  
   C) The shape of the system eliminates the need for egestion.  
   D) Digestive enzymes are not used in the system.
23. Which statement best describes nutrition in the hydra?
   A) Food is ingested with the help of cilia.
   B) Food is digested in a crop.
   C) Phagocytic cells lining the digestive cavity digest food intracellularly.
   D) Salivary glands are involved in the digestion of food.

24. If a grasshopper’s gastric caeca stopped functioning, which activity would be affected first?
   A) chemical breakdown of food in the digestive tube
   B) transmission of impulses by the nerve cord
   C) taking in of air by the spiracles
   D) release of hormones into the transport system

25. Which statement best describes the process of digestion in fungi and bacteria?
   A) It occurs as a result of the dehydration synthesis of foods within these organisms.
   B) It results in the production of starch and protein molecules.
   C) It occurs as a result of the enzymatic hydrolysis of foods outside these organisms.
   D) It occurs within a highly specialized digestive system.

26. The diagram below represents a microorganism as seen under high power (430×) of a compound light microscope.

   Which organelle should be observed to determine whether the paramecium has recently ingested stained yeast cells?
   A) A  B) B  C) C  D) D

27. Which statement best describes extracellular digestion?
   A) Large insoluble molecules are converted to small soluble molecules outside the cell
   B) Large insoluble molecules are converted to small soluble molecules within the cell.
   C) Small soluble molecules are converted to large insoluble molecules outside the cell.
   D) Small soluble molecules are converted to large insoluble molecules within the cell.

28. Which molecule can diffuse from the digestive tract into the human bloodstream without first being digested?
   A) protein  B) starch  C) fat  D) glucose

29. The pancreas, an organ which secretes enzymes directly into the intestine, helps
   A) break down food in the intestine
   B) prevent food from being digested in the intestine
   C) degrade the intestine
   D) preserve the structure of the intestine

30. All of the following are organs of the digestive system except
   A) the stomach  B) the mouth  C) the intestines  D) the heart

31. Enzymes and acidic juices in the stomach, which break proteins down into smaller molecules, is known as
   A) circulation
   B) chemical digestion
   C) excretion
   D) mechanical digestion

32. Teeth chewing food into smaller digestible pieces is known as
   A) chemical digestion
   B) circulation
   C) mechanical digestion
   D) regulation

33. The interaction of which two systems provides the molecules needed for the metabolic activity that takes place at ribosomes?
   A) digestive and circulatory
   B) reproductive and excretory
   C) immune and nervous
   D) respiratory and muscular
34. The digestion of starch begins in the
   A) mouth       B) stomach
   C) gallbladder  D) small intestine

35. Base your answer to the following question on the diagram below represents a portion of the human body.

The principal function of structure X is to
   A) produce salivary enzymes
   B) secrete sex hormones
   C) absorb water
   D) digest bile

36. Base your answer to the following question on the diagram and graph below and on your knowledge of biology. The diagram represents the human digestive system. Pepsin and trypsin are human digestive enzymes.

The graph indicates that pepsin would function best in the
   A) mouth       B) stomach
   C) small intestine  D) large intestine
37. In humans, structures that absorb most of the products of digestion are the
A) ducts of the pancreas
B) cells of the esophagus
C) villi of the small intestine
D) muscular folds of the gallbladder
Base your answers to questions 38 and 39 on the diagram below.

38. Peristalsis occurs in structures
A) A and D
B) B and C
C) C and E
D) E and F

39. A digestive function of organ C is the synthesis and secretion of
A) salivary amylase
B) protease
C) hydrochloric acid
D) bile

40. Which type of digestion occurs in the mouth when an individual chews a piece of bread?
A) mechanical digestion, only
B) chemical digestion, only
C) both mechanical and chemical digestion
D) neither mechanical nor chemical digestion

41. What occurs during the digestion of proteins?
A) Specific enzymes break down proteins into amino acids.
B) Specific hormones break down proteins into simple sugars.
C) Specific hormones break down proteins into complex starches.
D) Specific enzymes break down proteins into simple sugars.

42. Choking on food is most likely caused by an interference with the proper functioning of the
A) diaphragm
B) nasal cavity
C) bronchial tubes
D) epiglottis

43. Base your answer to the following question on Which lettered structure in the diagram below produces enzymes for the digestion of nutrients in the small intestine?

A) A
B) B
C) C
D) D

44. In humans, chemical digestion is accomplished by enzyme action that begins in the mouth and ends in the
A) esophagus
B) stomach
C) small intestine
D) gallbladder
Base your answers to questions 45 through 47 on the diagram below of the human digestive system and on your knowledge of biology.

45. In which structure does extracellular chemical digestion of protein begin?
   A) G  B) B  C) C  D) E

46. From which structure are glucose and amino acids normally absorbed into the circulatory system?
   A) F  B) H  C) C  D) E

47. In which structure does the initial hydrolysis of carbohydrates occur?
   A) A  B) E  C) C  D) D

Base your answers to questions 48 through 51 on the diagram below, which represents the human digestive system.

48. Most reabsorption of water occurs within structure
   A) F  B) G  C) C  D) D

49. Most chemical digestion of proteins occurs in the areas represented by letters
   A) A and F  B) B and G  C) C and E  D) D and G

50. Which statement best describes the chemical digestion of carbohydrates?
   A) It begins in A and ends in G.
   B) It begins in B and ends in C.
   C) It begins in G and ends in D.
   D) It begins in A and ends in E.

51. Peristalsis occurs in the structures represented by letters
   A) B, C, and D  B) B, C, and F
   C) A, C, and G  D) D, F, and G

52. In humans, villi that absorb monosaccharides and amino acids are found within the
   A) stomach  B) small intestine
   C) pancreas  D) esophagus
53. Base your answer to the following question on Which process is illustrated in the diagrams below?

A) circulation  B) absorption
C) peristalsis  D) ingestion

54. Which process in humans would be most directly affected if peristalsis were to stop?

A) the transmission of nerve impulses throughout the body
B) the movement of food through the gastrointestinal tract
C) the flow of blood through the lungs
D) the removal of excess amino acids from the blood

55. In a human, peristalsis occurs in which organs?

A) salivary gland, esophagus, and stomach
B) stomach, small intestine, and pancreas
C) esophagus, stomach, and small intestine
D) esophagus, small intestine, and liver

56. Food is moved through the small intestine by a muscular process known as

A) passive transport
B) phagocytosis
C) dehydration synthesis
D) peristalsis

57. Water is removed from the undigested material in

A) A  B) B  C) E  D) D

58. The final products of digestion are absorbed almost entirely in

A) F  B) B  C) C  D) D

59. Enzymes secreted by the pancreas enter the system at

A) E  B) B  C) C  D) D

60. The organ represented by letter C is most probably the

A) esophagus  B) stomach
C) small intestine  D) large intestine

61. Proteins are digested in both

A) A and B  B) B and C
C) C and D  D) A and C

62. Which activity normally occurs in the esophagus of a human?

A) hydrolysis of protein
B) process of peristalsis
C) secretion of amylase
D) absorption of cellulose
63. Base your answer to the following question on Which structure represented in the diagram below absorbs most of the fatty acids and glycerol from the small intestines

A) A  B) B  C) C  D) D

64. Extensive damage to the large intestine would have the greatest effect on

A) glucose metabolism  B) protein synthesis
C) enzyme secretion  D) water reabsorption

65. Base your answer to the following question on The diagram below shows the digestive system of a student who has eaten a sandwich consisting of two slices of bread, chicken, lettuce, and mayonnaise.

The final reactions for the complete hydrolysis of the bread would occur in organ

A) 1  B) 2  C) 3  D) 5

66. In the human body, hydrochloric acid is responsible for the low pH of the contents of the

A) lungs  B) kidney
C) liver  D) stomach

67. Base your answer to the following question on Which statement best expresses the information represented in the graph shown below?

A) The action of enzymes varies with pH.
B) A pH of 7 provides the optimum environment for digestive enzymes.
C) Gastric juice is active at a pH extending from 0 to 12.
D) Acids have a pH greater than 7.

68. The absorptive surface of the small intestine is greater than that of other human digestive organs because of its length and the presence of

A) alveoli  B) neurons
C) villi  D) nephrons

69. In which human digestive organ do proteases function?

A) mouth  B) esophagus
C) gall bladder  D) stomach

70. What is the role of teeth in digestion?

A) They break down food chemically, aiding the movement of the food through the esophagus.
B) They break down food chemically, mixing saliva with the food for easier digestion.
C) They break down food mechanically, increasing the surface area of the food for enzyme action.
D) They break down food mechanically, stimulating enzyme synthesis in the food.
71. The diagram below represents a portion of the esophagus.

Which is a correct statement about the process shown in the diagram?
A) It transports nutrients within the digestive tract.
B) It must occur prior to mechanical digestion food in the oral cavity.
C) It emulsifies fats for hydrolysis in the small intestine.
D) It increases water absorption by the esophagus.

72. Adult humans normally produce feces with low water content due to the activities of the
A) large intestine
B) small intestine
C) stomach
D) anus

73. Which substances are released into the small intestine of a human and aid in the digestion of the intestinal contents?
A) bile, pancreatic juice, and intestinal juice
B) hydrochloric acid, pancreatic juice, and intestinal juice
C) salivary amylase, intestinal juice, and pancreatic juice
D) bile, hydrochloric acid, and salivary amylase

74. Into which parts of the human digestive system are digestive enzymes secreted?
A) mouth, esophagus, stomach
B) stomach, small intestine, large intestine
C) mouth, stomach, small intestine
D) esophagus, stomach, large intestine

75. Which gland does not secrete hormones?
A) pituitary gland
B) thyroid gland
C) sex gland
D) salivary gland

76. The pancreas is an organ connected to the digestive tract of humans by a duct (tube) through which digestive enzymes flow. Why are these enzymes important to the digestive system?
A) They form proteins needed in the stomach.
B) They form the acids that break down food.
C) They change food substances into molecules that can pass into the bloodstream and cells.
D) They change food materials into wastes that can be passed out of the body.

77. Glycogen is best described as a
A) complex carbohydrate that is often stored in red blood cells
B) complete protein necessary for the synthesis of cell membranes
C) polysaccharide that is synthesized and stored within the human liver
D) by-product of sucrose digestion within the pancreas

78. Which structures secrete chemicals utilized for the completion of digestion within the small intestine?
A) liver and pancreas
B) glomerulus and villi
C) esophagus and alveoli
D) gallbladder and pharynx

79. After food enters the small intestine, lipases, proteases, and amylases are secreted into the small intestine by the
A) liver
B) gallbladder
C) salivary glands
D) pancreas
Base your answers to questions 80 and 81 on the diagram below of some human digestive organs and on your knowledge of biology.

80. Which organ is the initial site of the extracellular chemical digestion of proteins?
   A) A  B) B  C) E  D) D

81. Which organ synthesizes both urea and bile?
   A) A  B) E  C) C  D) D

82. Which structure produces a substance that aids in the mechanical breakdown of fats?
   A) liver  B) thyroid gland  C) testes  D) pituitary gland

83. In humans, structures that release digestive secretions directly into the small intestine include both the
   A) salivary glands and the pancreas  B) gall bladder and the lacteals  C) villi and the salivary glands  D) pancreas and the gall bladder

Base your answers to questions 84 through 87 on the diagram below. For each statement select the organ, that is most closely associated with the statement below. [A number may be used more than once or not at all.]

84. Materials to be egested are stored in this organ.
   A) 5  B) 2  C) 3  D) 4

85. The chemical digestion of protein begins within this organ.
   A) 1  B) 2  C) 5  D) 4

86. Gastric juice is produced in this organ.
   A) 5  B) 2  C) 3  D) 4

87. This organ stores bile.
   A) 6  B) 2  C) 5  D) 4

88. Emulsification of fats in the small intestines is due to the action of bile, which is released into the intestine from the
   A) stomach  B) gall bladder  C) villi  D) lacteals
Base your answers to questions 89 and 90 on the diagram below which represents the pathway of the blood throughout the body.

89. An acid necessary for enzyme action to occur is found within structure
   A) 10     B) 2     C) 5     D) 4

90. Within which structure are red blood cells broken down?
   A) 1     B) 6     C) 7     D) 9

91. Which process is represented by the diagram below?

   A) emulsification     B) excretion
   C) absorption     D) peristalsis

92. Bile is a secretion which aids in the digestion of
   A) lipids     B) proteins
   C) saccharides     D) starches

93. If no carbohydrate ingestion occurs in the body during a 24-hour period, liver activity provides for the body's needs by
   A) emulsification     B) manufacturing more bile
   C) converting glycogen into glucose     D) releasing iron

94. The digestive system breaks carbohydrates down into simple sugars. This is important because
   A) Sugars are required to maintain the structure of the cell
   B) Simple sugars are not required by the brain
   C) Simple sugars are required for metabolism
   D) Sugars are responsible for all cellular communication in the body

95. The digestion of food and subsequent absorption into the bloodstream is important because
   A) glucose     B) protein
   C) starch     D) oxygen

96. Three days after an organism eats some meat, many of the organic molecules originally contained in the meat would be found in newly formed molecules of
   A) glucose     B) protein
   C) starch     D) oxygen

97. Which nutrient should provide the largest percentage of calories in a well-balanced diet?
   A) saturated lipids     B) complete proteins
   C) complex carbohydrates     D) water

98. A source of roughage in the human diet is supplied by certain
   A) saturated lipids     B) complete proteins
   C) complex carbohydrates     D) nucleic acids

99. Which components of the human diet contain the greatest amounts of sugars and starches?
   A) meat and eggs     B) fruits and vegetables
   C) minerals and milk     D) water and vitamins
100. In some regions of the world, children suffer from a protein deficiency known as kwashiorkor. This deficiency occurs when a child's diet is changed from high-protein breast milk to watery cereal. Even though the child is receiving calories, the child becomes sick and less active, and growth ceases. These symptoms are probably due to

A) too many nucleic acids in the diet  
B) an overconsumption of complete protein foods  
C) not enough carbohydrates in the diet  
D) a lack of essential amino acids in the diet

101. Which substance is a nutrient in the human diet?

A) oxygen  
B) carbon dioxide  
C) water  
D) roughage

102. Which foods should be included in a balanced diet as a good source of roughage?

A) red meat and poultry  
B) fresh fruits and vegetables  
C) eggs and milk products  
D) animal fat and plant oil

103. Which food would provide the most roughage for the body?

A) baked fresh fish  
B) lettuce-and-tomato salad  
C) fried chicken breast  
D) milkshake

104. Some vitamins are essential to an organism because they function as

A) coenzymes  
B) auxins  
C) hormones  
D) neurotransmitters

105. Vitamin B₁ assists an organic catalyst in cell respiration. This vitamin functions as

A) a polypeptide  
B) a coenzyme  
C) a substrate  
D) an inorganic catalyst

106. Which type of food in the human diet provides the greatest amount of roughage per gram?

A) lean meat  
B) green vegetables  
C) whole milk  
D) table sugar

107. Which nutrients can be absorbed without first being digested in the human gastrointestinal tract?

A) carbohydrates and polypeptides  
B) proteins and vitamins  
C) minerals and polysaccharides  
D) vitamins and minerals

108. In gastric bypass surgery, the stomach is reduced to hold 1 ounce of food, instead of 3 pints. This surgery would drastically impact one's digestive system

A) excretory system  
B) digestive system  
C) circulatory system  
D) respiratory system

109. If a person was unable to break down food particles into molecules that could be absorbed by the body, you would predict

A) predators  
B) pathogenic organisms  
C) parasitic fungi  
D) decomposers

110. *Salmonella* bacteria can cause humans to have stomach cramps, vomiting, diarrhea, and fever. The effect these bacteria have on humans indicates that *Salmonella* bacteria are

A) appendicitis  
B) gallstones  
C) constipation  
D) diarrhea

111. A disorder of the digestive system that can cause severe dehydration is known as

A) ulcers  
B) appendicitis  
C) diarrhea  
D) constipation

112. Feces is usually about 40 percent water and 60 percent solid matter. Reducing the water content to 20 percent would most likely result in

A) ulcers  
B) appendicitis  
C) diarrhea  
D) constipation

113. A branch of the nerve regulating the secretions of the stomach can be cut surgically. The decrease in hydrochloric acid secretion that would result from this procedure would be most helpful to an individual with

A) diarrhea  
B) appendicitis  
C) gallstones  
D) ulcers
114. Hardened deposits of cholesterol that accumulate in the structure that stores bile are known as
A) gallstones   B) ulcers
C) goiters      D) allergies

Base your answers to questions 115 through 117 on select the organ, chosen from the diagram below, that is most closely related to that malfunction.

A) 1    B) 3    C) 2    D) 4    E) 5

115. A painful condition results from erosion of the surface of this organ by gastric juices.
A) 1    B) 3    C) 2    D) 4    E) 5

116. Accumulations of hardened cholesterol deposits form gallstones in this organ.
A) 1    B) 2    C) 3    D) 4    E) 5

117. Too much unabsorbed water in this organ results in diarrhea.
A) 1    B) 2    C) 3    D) 4

118. Which disorder would most directly interfere with the emulsification of fats?
A) bronchitis   B) gout
C) goiter       D) gallstones

119. Base your answer to the following question on Which disorder is most likely represented by the "festering" pit shown in the cartoon below?

A) a gallstone   B) an ulcer
C) appendicitis  D) a goiter
Base your answers to questions 120 and 121 on the organ, indicated in the diagram below, that is most closely associated with that statement.

120. When the surface of the alimentary canal is eroded in this organ, ulcers may occur.
   A) 1    B) 2    C) 3    D) 4    E) 5

121. Diarrhea results from decreased water absorption in this organ.
   A) 1    B) 3    C) 5    D) 6    E) 7