1) 4 2) 1 3) 2 4) 4 5) 3

6) 1 7) 3 8) 3 9) 4

10) SAMPLE ANSWERS:
(a) digestion and transport OR respiration and photosynthesis;
(b) Digestion breaks food down into smaller molecules which can pass across the lining of the intestine and enter the blood and be transported to cells for energy release. OR Photosynthesis produces food that is broken down by respiration to make energy available.

11) 2 12) 1 13) 2 14) 3 15) 2

16) 2 17) 3 18) 1 19) 4 20) 3

21) 1 22) 2 23) 4 24) 2 25) 3

26) 2 27) 3 28) 4 29) 1 30) 1

31) 4 32) 2

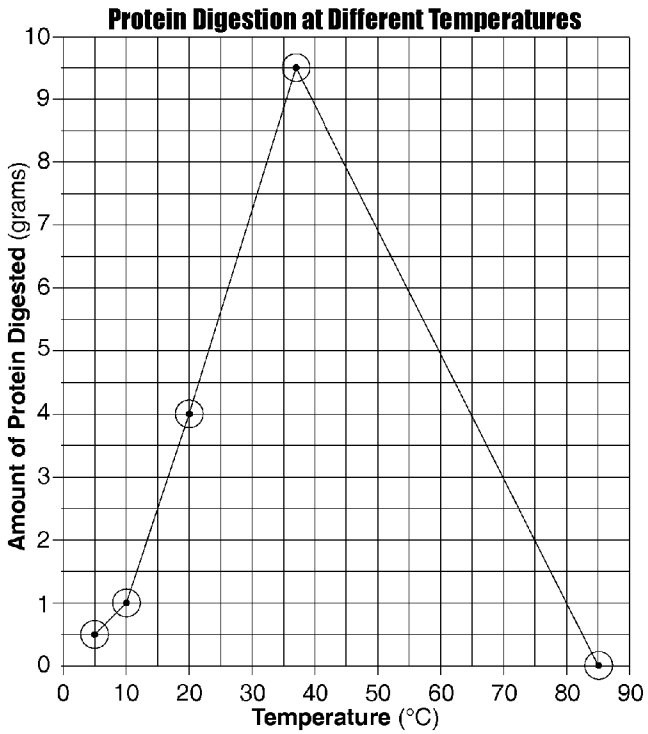
33) SAMPLE ANSWERS:
(a) temperature OR pH OR concentration of enzyme OR substrate;
(b) If the shape changes, it will not fit with the same substrate. OR The enzyme no longer fits with the molecules with which it interacted before. OR Shape determines function.

34) SAMPLE ANSWERS: The blood absorbs nutrients. OR Food is added to the blood as it flows through the digestive system. OR Sugar is added. OR Amino acids are added. OR decrease in oxygen

35) pancreas

36) 4 37) 2

38)



39) SAMPLE ANSWERS: The enzyme in stomach fluid will not digest starch. OR The enzyme in stomach fluid is specific for protein digestion.

40) 4 41) 3 42) 1 43) 4 44) 3

45) 1 46) 2 47) 3 48) 2 49) 1

50) 3 51) 1 52) 4 53) 1

54) SAMPLE ANSWERS: Cell communication would be disrupted. OR The work of acetylcholine would occur continuously. OR Nerve signals would not be turned off.

55) SAMPLE ANSWERS: circulatory — carries insulin from pancreas throughout body OR digestive — absorbs sugar from digested food OR endocrine — makes hormones that regulate sugar level

56) pancreas OR Islets of Langerhans

57) SAMPLE ANSWERS: sugar OR glucose OR ketones

58) SAMPLE ANSWERS: The shape of the receptor molecule... is specific for a specific molecule. OR ...determines what signals (chemical) it can respond to. OR ...is specific for the chemical with which it can interact.

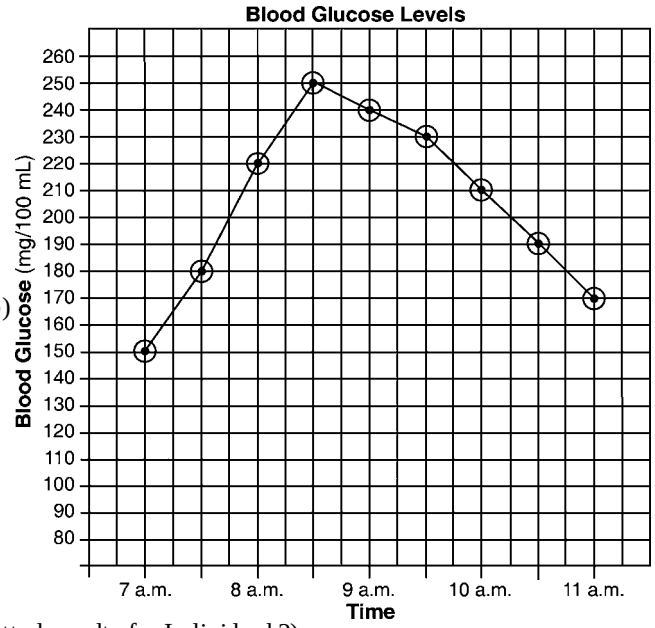
59) SAMPLE ANSWERS: The liver would receive less insulin. OR It would take more time for a given amount of glucose to enter liver cells. OR It would affect the ability of the liver to regulate the level of sugar in the blood.

60) SAMPLE ANSWERS: engulf foreign substances OR produce antibodies OR recognize pathogens/antigens

61) SAMPLE ANSWERS: Insulin regulates blood sugar levels. OR Estrogen or testosterone regulates the reproductive system.

62) hormones

63) (a-b)



(plotted results for Individual 2)

64) insulin

65) SAMPLE ANSWERS: The person had a meal containing carbohydrates. OR The person ate breakfast. OR digestion or absorption

66) SAMPLE ANSWERS: homeostasis OR steady state OR dynamic equilibrium

67) 2 68) 3 69) 1 70) 2 71) 3

72) 4 73) 2 74) 4 75) 1 76) 1

77) 3 78) 2 79) 4 80) 2

81) SAMPLE ANSWERS: by engulfing invaders OR by producing antibodies OR by marking invaders for killing

82) SAMPLE ANSWER: A vaccine contains dead or weakened pathogens or their products.

83) SAMPLE ANSWER: immune system

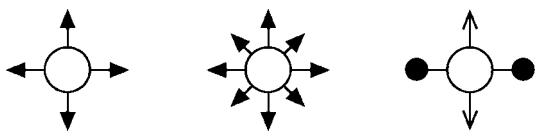
84) SAMPLE ANSWERS: White blood cells produce antibodies for a particular pathogen. OR White blood cells are prepared to recognize a particular pathogen in the future. OR causes the immune system to produce antibodies OR stimulates an immune response

85) SAMPLE ANSWERS:
(1) a dead virus OR a weakened virus OR weakened pathogen
(2) Antibodies are produced by a certain type of white blood cell in response to the vaccine.
(3) Antibodies have specific shapes and each antibody shape is complementary to only one shape of virus or antigen.
(4) Since the common cold is caused by many different viruses, a vaccine would have to contain all the different types of cold viruses.

86) SAMPLE ANSWERS:
(1) The immune system will reject the organ by producing antibodies. OR Antibodies will cause the organ to be rejected by the recipient. OR The immune system recognizes the organ as foreign and attacks it.
(2) The identical twin of the recipient has the same genetic makeup as the recipient. OR Identical twins have the same DNA. OR The recipient will not reject the donated kidney. OR Twins have the same proteins. OR The immune system doesnt recognize the kidney as foreign tissue and will not respond by producing antibodies.;
(3) to stop the immune system from attacking the donated organ OR The drugs will block the production of antibodies. OR The donated kidney has different proteins.;
(4) Immunosuppressant drugs may depress the immune system and make the recipient OR more susceptible to disease OR weakens the immune system

87) SAMPLE ANSWERS:
(1) Antigens stimulate the immune response. OR Antigens on the chicken pox virus are recognized by the person's immune system and it responds by producing antibodies.;
(2) White blood cells attack and destroy the virus. OR White blood cells are able to recognize foreign antigens. OR White blood cells make antibodies against the virus.;
(3) These antibodies are specific for the chicken pox virus. OR The antibodies the body makes against the chicken pox antigens (or virus) have specific shapes that only work against the antigens on the chicken pox virus, not the measles virus, because their antigens are shaped differently.;
(4) A vaccine contains weakened virus. OR A vaccine usually consists of a dead or weakened form of the disease organism that stimulates the production of antibodies without causing the disease.

88) 4 89) 1

90) 

91) SAMPLE ANSWERS: mutation OR mutagenic agent that led to a new protein

92) 1 93) 3 94) 3 95) 3 96) 1

97) 4

98) SAMPLE ANSWERS: Less urine would be produced because a large amount of water is being lost as sweat. OR Less urine will

be produced because the feedback mechanisms in the kidneys regulate water levels in the blood. OR The runner would sweat more, decreasing H_2O levels in the blood. This decrease would slow urine production because there is less water in the blood to be filtered. OR Urine would be more concentrated because it would contain less water.

99) SAMPLE ANSWERS: It could raise their blood pressure. OR It could cause them to retain water. OR It could decrease urine production.

100) SAMPLE ANSWERS: Increased insulin results in a decrease in blood sugar levels. OR As the CO_2 level in the blood increases, the breathing rate increases. OR When the guard cells close openings in leaves, rate of water loss decreases.

101) SAMPLE ANSWERS: reduces loss of sodium OR cools the body OR decreases amount of perspiration OR slows down water loss OR reduces the chances of hyponatremia

102) SAMPLE ANSWERS: insulin —– prevent regulation of glucose levels in blood OR estrogen (or testosterone) —– interfere with messages for development of sex characteristics

103) 3

104) SAMPLE ANSWERS: The reactions in rat cells could be different from those in other organisms. OR to increase validity OR The results of the experiment indicate only what happens in cells outside the organism.

105) SAMPLE ANSWERS: (1) small intestine OR digestive system; (2) sugar OR amino acid OR digested food; (3) sugar diffuses from the inside of the small intestine into the blood.

106) SAMPLE ANSWERS: PKU is a disorder that can result in damage to the brain. It is caused by inheritance of a mutation. Children with PKU will be developmentally delayed. If a specific amino acid is removed from the childís diet, the symptoms will not occur. OR Diabetes is a disease that can result from an inability to produce enough insulin. The level of glucose in the blood and urine will be high. This may lead to blindness or kidney problems. Frequent urination and thirst are major symptoms. Insulin injections can be used to regulate blood sugar levels.

107) SAMPLE ANSWERS: PAIR 1: The muscular system enables an organism to move. The nervous system detects stimuli and sends messages. The muscles receive messages carried by nerves and contract, resulting in movement.; OR PAIR 2: The respiratory system brings in oxygen and the digestive system breaks down food so that both substances are available to cells to make ATP.; OR PAIR 3: The circulatory system carries wastes. The excretory system removes wastes from the blood and excretes them.