Exam

Name_____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

1) Which of the following statements about cells is *true*? 1) _____
A) All cells have cell walls.
B) All cells are attached to other cells.
C) All cells are motile.
D) All cells have internal structures that move.

2) Many of the enzymes that control a deep–sea firefly squid's ability to produce light energy from chemical energy are located 2) _____
A) within mitochondria. B) outside of cells.
C) within chloroplasts. D) in membranes.

3) The fluid mosaic model describes the plasma membrane as consisting of 3) _____
A) diverse proteins embedded in a phospholipid bilayer.
B) a phospholipid bilayer with embedded carbohydrates.
C) carbohydrates and phospholipids that can drift in the membrane.
D) two layers of phospholipids with cholesterol sandwiched between them.

4) Membrane phospholipids 4) _____
A) are able to drift about in the plasma membrane
B) have hydrophobic heads that face the center of the membrane and are shielded from water.
C) have hydrophilic tails that face outward and are exposed to water.
D) remain fluid because they are tightly packed against one another.

5) The cholesterol associated with animal cell membranes 5) _____
A) is an abnormality resulting from a diet high in cholesterol.
B) helps solidify the membranes when the room temperature is below freezing.
C) is attached to membrane proteins and extends into the watery environment surrounding the cell.
D) helps to stabilize the cell membrane at body temperature.

6) A major function of glycoproteins and glycolipids in the cell membrane is to 6) _____
A) glue cells together to form tissues.
B) attach the cell membrane to the cytoskeleton.
C) help the cell retain its shape.
D) allow the cells of an embryo to sort themselves into tissues and organs.

7) When physicians perform an organ transplant, they choose a donor whose tissues match those of the recipient as closely as possible. Which of the following cell components are being matched? 7) _____
A) plasma membrane cholesterols B) cell–surface carbohydrates
C) plasma membrane proteins D) plasma membrane phospholipids

8) Most of the functions of a cell membrane, including transport and enzymatic function, are performed by 8) _____
A) proteins. B) phospholipids. C) glycolipids. D) cholesterol.

9) Which of the following statements regarding membrane protein function is *false*? 9) _____
A) Membrane proteins act as receptors to molecules like hormones.
B) Membrane proteins transfer genetic information to the cytoplasm.
C) Membrane proteins form junctions between cells.
D) Membrane proteins serve as enzymes.

10) Relaying a message from a membrane receptor to a molecule that performs a specific function within a cell is called 10) _____
A) competition.
B) signal transduction.
C) selective permeability.
D) inhibition.

11) Plasma membranes are selectively permeable. This means that 11) _____
A) anything can pass into or out of a cell as long as the membrane is intact and the cell is healthy.
B) plasma membranes must be very thick.
C) glucose cannot enter the cell.
D) the plasma membrane allows some substances to enter or leave a cell more easily than others.

12) Which of the following statements regarding membrane function is *false*? 12) _____
A) The plasma membrane has receptors for chemical messages.
B) The plasma membrane plays a role in signal transduction.
C) The plasma membrane is the control center of the cell.
D) The plasma membrane forms a selective barrier around the cell.

13) Which characteristic promoted the utilization of lipids as the first cell membrane? 13) _____
A) formation of a semi–solid membrane
B) self–assembly into a simple membrane
C) spontaneous degradation of the intracellular environment
D) ability to form an impermeable membrane

14) All cells are enclosed by a plasma membrane that is similar in _____ and _____. 14) _____
A) lucidity . . . texture
B) permeability . . . content
C) thickness . . . composition
D) structure . . . function

15) Small, nonpolar, hydrophobic molecules such as fatty acids 15) _____
A) easily pass through a membrane's lipid bilayer.
B) very slowly diffuse through a membrane's lipid bilayer.
C) are actively transported across cell membranes.
D) require transport proteins to pass through a membrane's lipid bilayer.

16) Which of the following substances would have the most trouble crossing a biological membrane by diffusing through the lipid bilayer? 16) _____
A) Na^+
B) CO_2
C) O_2
D) a small, nonpolar molecule such as butane (C_4H_{10})

17) Oxygen crosses a plasma membrane by 17) _____
A) passive transport.
B) pinocytosis.
C) osmosis.
D) active transport.

18) Which of the following statements regarding diffusion is *false*? 18) _____

A) Diffusion occurs when particles spread from areas where they are less concentrated to areas where they are more concentrated.
B) Diffusion occurs even after equilibrium is reached and no net change is apparent.
C) Diffusion requires no input of energy into the system.
D) Diffusion is a result of the thermal energy of atoms and molecules.

19) Diffusion does not require the cell to expend ATP. Therefore, diffusion is considered a type of 19) _____

A) exocytosis.
B) endocytosis.
C) active transport.
D) passive transport.

20) Osmosis can be defined as 20) _____

A) the diffusion of nonpolar molecules.
B) the diffusion of water.
C) active transport.
D) the diffusion of a solute.

21) When two aqueous solutions that differ in solute concentration are placed on either side of a semipermeable membrane and osmosis is allowed to take place, the water will 21) _____

A) exhibit a net movement to the side with lower solute concentration.
B) exhibit an equal movement in both directions across the membrane.
C) exhibit a net movement to the side with higher free water concentration.
D) exhibit a net movement to the side with lower free water concentration.

22) In the lab, you use a special balloon that is permeable to water, but not sucrose, to make an "artificial cell." The balloon is filled with a solution of 20% sucrose and 80% water and is immersed in a beaker containing a solution of 40% sucrose and 60% water. Which of the following will occur? 22) _____

A) Water will enter the balloon.
B) Water will leave the balloon.
C) Sucrose will enter the balloon.
D) Sucrose will leave the balloon.

23) Some protozoans have special organelles called contractile vacuoles that continually eliminate excess water from the cell. The presence of these organelles tells you that the environment 23) _____

A) is hypertonic to the protozoan.
B) is hypotonic to the protozoan.
C) is isotonic to the protozoan.
D) contains a higher concentration of solutes than the protozoan.

24) A cell that neither gains nor loses water when it is immersed in a solution must be 24) _____

A) hypotonic to its environment.
B) hypertonic to its environment.
C) metabolically inactive.
D) isotonic to its environment.

25) In a hypotonic solution, an animal cell will 25) _____

A) lyse.
B) shrivel.
C) neither gain nor lose water.
D) experience turgor.

26) If placed in tap water, an animal cell will undergo lysis, whereas a plant cell will not. What accounts for this difference? 26) _____

A) the expulsion of water by the plant cell's central vacuole
B) the relative impermeability of the plant cell wall to water
C) the relative inelasticity and strength of the plant cell wall
D) the fact that plant cells are isotonic to tap water

27) In the lab, you use a special balloon that is permeable to water but not sucrose to make an "artificial cell." The balloon is filled with a solution of 20% sucrose and 80% water and is immersed in a beaker containing a solution of 40% sucrose and 60% water. The solution in the balloon is _____ relative to the solution in the beaker. 27) _____

A) hydrophilic B) isotonic C) hypertonic D) hypotonic

28) White blood cells (WBCs) are more resistant to lysis than red blood cells (RBCs). When looking at a sample of blood for WBCs, what could you do to reduce interference from RBCs? 28) _____

A) Mix the blood in a salty solution to cause the RBCs to lyse.
B) Mix the blood in an isotonic solution and allow the WBCs to float to the top.
C) Mix the blood in a hypertonic solution, which will cause the RBCs to lyse.
D) Mix the blood in a hypotonic solution, which will cause the RBCs to lyse.

29) A plant cell in a hypotonic solution 29) _____

A) shrivels because of an outflow of water.
B) becomes turgid because of an inflow of water.
C) bursts because of an inflow of water.
D) wilts because of an outflow of water.

30) You are adrift in the Atlantic Ocean, and, being thirsty, drink the surrounding seawater. As a result, 30) _____

A) you quench your thirst.
B) you dehydrate yourself.
C) your cells become turgid.
D) your cells lyse from excessive water intake.

31) Facilitated diffusion across a biological membrane requires _____ and moves a substance _____ its concentration gradient. 31) _____

A) energy and transport proteins . . . against B) energy and transport proteins . . . down
C) transport proteins . . . against D) transport proteins . . . down

32) The molecules responsible for membrane transport are 32) _____

A) proteins. B) carbohydrates. C) steroids. D) phospholipids.

33) Which of the following statements is *true* among all types of passive transport? 33) _____

A) The concentration gradient is the driving force.
B) Ions never cross the plasma membrane by passive transport.
C) Only small polar molecules are able to cross the plasma membrane.
D) Proteins are needed to transport molecules across the membrane.

34) Aquaporins 34) _____

A) are found in all cells.
B) allow water to cross the plasma membrane against its concentration gradient.
C) allow for the active transport of water.
D) allow water to cross the plasma membrane via facilitated diffusion.

35) Which of the following processes can move a solute against its concentration gradient? 35) _____

A) active transport B) osmosis
C) facilitated diffusion D) passive transport

36) Which of the following is a typical feature of an ATP–driven active transport mechanism? 36) _____
A) The transport protein must cross to the correct side of the membrane before the solute can bind to it.
B) The transport protein is irreversibly phosphorylated as transport takes place.
C) The solute moves against the concentration gradient.
D) The transport protein catalyzes the conversion of ADP to ATP.

37) Which of the following statements regarding active transport is *false*? 37) _____
A) Active transport uses ATP as an energy source.
B) Active transport is driven by the concentration gradient.
C) Active transport can move a solute against its concentration gradient.
D) Active transport requires the cell to expend energy.

38) Certain cells that line the stomach synthesize a digestive enzyme and secrete it into the stomach. This enzyme is a protein. Which of the following processes could be responsible for its secretion? 38) _____
A) pinocytosis B) exocytosis C) diffusion D) endocytosis

39) The process of a white blood cell engulfing a bacterium is 39) _____
A) pinocytosis. B) phagocytosis.
C) osmosis. D) receptor–mediated endocytosis.

40) Phagocytosis is to eating as pinocytosis is to 40) _____
A) lysis. B) chewing. C) drinking. D) osmosis.

41) Cells acquire LDLs by 41) _____
A) phagocytosis. B) receptor–mediated endocytosis.
C) pinocytosis. D) diffusion.

42) Kinetic energy differs from chemical energy in that 42) _____
A) kinetic energy is stored energy that has the potential to do work, and chemical energy is the energy of movement.
B) chemical energy is a particular form of kinetic energy.
C) kinetic energy can be converted into various forms of energy, whereas chemical energy can only be converted into heat.
D) kinetic energy is the energy of a moving object, whereas chemical energy is the potential energy of molecules.

43) Glucose molecules provide energy to power the swimming motion of sperm. In this example, the sperm are changing 43) _____
A) kinetic energy into potential energy. B) kinetic energy into thermal energy.
C) chemical energy into kinetic energy. D) chemical energy into potential energy.

44) In the reaction A → B + C + heat, 44) _____
A) the potential energy of the products is greater than that of the reactant.
B) there is a net input of energy.
C) entropy has decreased.
D) the potential energy of the products is less than that of the reactant.

45) Which of the following statements regarding thermodynamics is *false*? 45) _____

A) A single cell or the planet Earth could be a thermodynamic system.
B) Thermodynamics is the study of energy transformations that occur in a collection of matter.
C) An automobile engine is a closed system because it does not exchange energy and matter with its surroundings.
D) An open system exchanges both energy and matter with its surroundings.

46) According to _____, energy cannot be created or destroyed. 46) _____

A) the third law of thermodynamics
B) Aristotle's first principle
C) the second law of thermodynamics
D) the first law of thermodynamics

47) A steer must eat at least 100 pounds of grain to gain less than 10 pounds of muscle tissue. This illustrates 47) _____

A) that energy transformations are typically 100% efficient.
B) the second law of thermodynamics.
C) that some energy is destroyed in every energy conversion.
D) the first law of thermodynamics.

48) Which of the following energy transfers is impossible in living systems? 48) _____

A) light energy to potential energy
B) light energy to chemical energy
C) chemical energy to kinetic energy
D) heat to light energy

49) Living systems 49) _____

A) violate the first law of thermodynamics.
B) are examples of a closed system.
C) violate the second law of thermodynamics.
D) decrease their entropy while increasing the entropy of the universe.

50) Which of the following processes is endergonic? 50) _____

A) the synthesis of glucose from carbon dioxide and water
B) the breakdown of glucose
C) the burning of wood
D) cellular respiration

51) What is the basic difference between exergonic and endergonic reactions? 51) _____

A) Exergonic reactions involve ionic bonds; endergonic reactions involve covalent bonds.
B) In exergonic reactions, the reactants have less chemical energy than the products; in endergonic reactions, the opposite is true.
C) Exergonic reactions release energy; endergonic reactions absorb it.
D) Exergonic reactions involve the breaking of bonds; endergonic reactions involve the formation of bonds.

52) Which of the following examples is classified as a metabolic pathway? 52) _____

A) cell lysis
B) osmosis
C) passive diffusion
D) protein synthesis

53) When a cell uses chemical energy to perform work, it uses the energy released from a(n) _____ reaction to drive a(n) _____ reaction. 53) _____

A) endergonic . . . exergonic
B) exergonic . . . endergonic
C) spontaneous . . . exergonic
D) exergonic . . . spontaneous

54) Which of the following statements about the ATP molecule is *true*? 54) _____

A) It contains the sugar glucose.
B) It releases energy when one phosphate group leaves ATP.
C) It contains five phosphate groups.
D) Extremely stable bonds link the second and third phosphate groups.

55) The transfer of a phosphate group to a molecule or compound is called 55) _____

A) phosphorylation. B) hydrogenation.
C) carboxylation. D) ionization.

56) Anything that prevents ATP formation will most likely 56) _____

A) result in cell death. B) force the cell to rely on ADP for energy.
C) force the cell to rely on lipids for energy. D) have no effect on the cell.

57) ATP can be used as the cell's energy exchange mechanism because 57) _____

A) endergonic reactions can be fueled by coupling them with the formation of ATP from ADP.
B) ATP is a disposable form of chemical energy, used once and then discarded by the cell.
C) ATP is the most energy-rich small molecule in the cell.
D) endergonic reactions can be fueled by coupling them with the hydrolysis of high-energy phosphate bonds in ATP.

58) An energy barrier 58) _____

A) is the amount of energy that must be produced by the reactants to end a chemical reaction.
B) prevents the spontaneous breakdown of molecules in the cell.
C) can only be overcome with the use of enzymes.
D) is higher than the activation energy of a reaction.

59) The energy required to initiate an exergonic reaction is called 59) _____

A) the activation energy. B) input energy.
C) exergonic energy. D) endergonic energy.

60) Most of a cell's enzymes are 60) _____

A) proteins. B) lipids. C) carbohydrates. D) amino acids.

61) When an enzyme catalyzes a reaction, 61) _____

A) it is used once and discarded.
B) it lowers the activation energy of the reaction.
C) it acts as a reactant.
D) it raises the activation energy of the reaction.

62) Substrates bind to an enzyme's _____ site. 62) _____

A) allosteric B) phosphate C) active D) inhibitory

63) The active site of an enzyme is 63) _____

A) the region of a substrate that is changed by an enzyme.
B) the highly changeable portion of an enzyme that adapts to fit the substrates of various reactions.
C) the region of a product that detaches from the enzyme.
D) the region of an enzyme that attaches to a substrate.

64) Which of the following statements regarding enzyme function is *false*? 64) _____
A) Enzymes emerge unchanged from the reactions they catalyze.
B) Enzymes are used up when they catalyze a chemical reaction, so must be synthesized for each new chemical reaction.
C) An enzyme's function depends on its three–dimensional shape.
D) Enzymes are very specific for certain substrates.

65) Which of the following statements regarding enzymes is *true*? 65) _____
A) An enzyme's function is unaffected by changes in pH.
B) Enzymes are inorganic.
C) Enzymes catalyze specific reactions.
D) All enzymes depend on protein cofactors to function.

66) A child is brought to the hospital with a fever of 107°F. Doctors immediately order an ice bath to lower the child's temperature. Which of the following statements offers the most logical explanation for this action? 66) _____
A) Elevated body temperatures may denature enzymes. This would interfere with the cell's abilities to catalyze various reactions.
B) Elevated body temperature will increase reaction rates in the child's cells and overload the limited number of enzymes found in the cell.
C) Elevated body temperatures cause molecules to vibrate more quickly and prevent enzymes from easily attaching to reactants. This would slow vital body reactions.
D) Elevated body temperatures will increase the energy of activation needed to start various chemical reactions in the body. This will interfere with the ability of enzymes to catalyze vital chemical reactions.

67) Heating inactivates enzymes by 67) _____
A) breaking the covalent bonds that hold the molecule together.
B) changing the enzyme's three–dimensional shape.
C) removing phosphate groups from the enzyme.
D) causing enzyme molecules to stick together.

68) Which of the following substances could be a cofactor? 68) _____
A) a polypeptide B) a protein C) a zinc atom D) a ribosome

69) Which of the following is a coenzyme? 69) _____
A) iron B) iodine C) vitamin B_6 D) zinc

70) How does inhibition of an enzyme–catalyzed reaction by a competitive inhibitor differ from inhibition by a noncompetitive inhibitor? 70) _____
A) Competitive inhibitors bind to the enzyme reversibly; noncompetitive inhibitors bind to it irreversibly.
B) Competitive inhibitors change the enzyme's tertiary structure; noncompetitive inhibitors cause polypeptide subunits to dissociate.
C) Competitive inhibitors bind to the active site of the enzyme; noncompetitive inhibitors bind to a different site.
D) Competitive inhibitors interfere with the enzyme; noncompetitive inhibitors interfere with the reactants.

71) Bacterial production of the enzymes needed for the synthesis of the amino acid tryptophan declines with increasing levels of tryptophan and increases as tryptophan levels decline. This is an example of 71) _____
A) competitive inhibition.
B) irreversible inhibition.
C) feedback inhibition.
D) noncompetitive inhibition.

72) Inhibition of an enzyme is irreversible when 72) _____
A) the shape of the enzyme is changed.
B) a competitive inhibitor is involved.
C) a noncompetitive inhibitor is involved.
D) covalent bonds form between inhibitor and enzyme.

73) Light microscopes 73) _____
A) typically provide more resolution than an electron microscope.
B) are generally not used to view bacteria.
C) work by reflecting electrons off the surface of an object being studied.
D) use light and glass lenses to magnify an image.

74) One centimeter = _____ millimeters. 74) _____
A) 0.10 B) 0.01 C) 100 D) 10

75) Resolution is the 75) _____
A) distance between the lenses of a microscope.
B) size of an image.
C) ability of an optical instrument to show two close objects as separate.
D) ability of an optical instrument to magnify an image.

76) Which of the following statements about electron microscopes is *true*? 76) _____
A) Transmission electron microscopes are mainly used to study cell surfaces.
B) Scanning electron microscopes are used to study the details of internal cell structure.
C) Electron microscopes focus electron beams to create a magnified image of an object.
D) Specimens must be sectioned to be viewed under a scanning electron microscope.

77) A scientist wants to examine living cells lining the respiratory tract to determine how the cells use tiny hairs to move dirt and mucus away from the lungs. Which of the following instruments would be best, and why? 77) _____
A) a transmission electron microscope, because it has high resolution
B) a scanning electron microscope, because it can be used to observe whole cells without slicing them
C) a scanning electron microscope, because it can reveal structures on cell surfaces
D) a light microscope, because it allows observations of whole, live cells

78) The idea that all living things are composed of cells and that all cells come from other cells defines 78) _____
A) the laws of inheritance.
B) organelle theory.
C) inheritance of acquired characteristics.
D) cell theory.

79) A scientist wants to magnify a pollen grain 8,000 times and examine the ridges and pores on its surface. Which one of the following instruments would be best? 79) _____
A) a transmission electron microscope
B) an inverted light microscope
C) a scanning electron microscope
D) a fluorescence confocal microscope

80) A scanning electron microscope is used to study _____, whereas a transmission electron microscope is used to study _____. 80) _____
A) live cells . . . dead cells
B) internal cell structures . . . cell surfaces
C) cell surfaces . . . internal cell structures
D) dead cells . . . live cells

81) The diameter of most animal and plant cells ranges from 81) _____
A) 0.1 to 1.0 micrometers.
B) 100 to 1000 micrometers.
C) 10 to 100 micrometers.
D) 1.0 to 10 micrometers.

82) As cell size increases, the 82) _____
A) surface area increases faster than the volume.
B) volume and surface area decrease.
C) volume increases faster than the surface area.
D) surface area and volume increase at the same rate.

83) Which of the following cells has the greatest surface–to–volume ratio? 83) _____
A) human muscle cell
B) ostrich egg
C) bacterium
D) human red blood cell

84) A cell is exposed to a substance that prevents it from dividing. The cell becomes larger and larger. This situation 84) _____
A) should present no problem to the cell, because the surface area of the cell will increase as the volume of the cell increases.
B) will eventually be problematic, since the cell's ability to absorb nutrients through its outer membrane will not keep increasing as quickly as its cytoplasmic needs.
C) should present no problem to the cell, since it can continue to perform all other necessary functions.
D) should be beneficial, since the cell will be able to divert the ATP normally used for cell division to other processes.

85) Your throat is dry, and you want the last cough drop in the box to last a long time in your mouth. What should you do? 85) _____
A) It doesn't matter if the cough drop is in one piece or many pieces; the total amount of cough drop is all that matters.
B) Break the cough drop into little pieces and put them all in your mouth. This decreases the surface–to–volume ratio, and slows the dissolution of the cough drop.
C) Break the cough drop into little pieces and put them all in your mouth. Since each little piece must be dissolved separately, the drop will last longer.
D) Keep the cough drop whole. This maintains the largest surface–to–volume ratio, and slows the dissolution of the cough drop.

86) Plasma membranes are permeable to 86) _____
A) hydrophilic molecules such as glucose.
B) nonpolar molecules such as CO_2.
C) large hydrophilic molecules such as starch.
D) small ions such as Na^+.

87) In the plasma membrane, the phospholipid heads 87) _____
A) are hydrophilic and face inward, shielded from water
B) are hydrophobic and face outward towards the aqueous solution on both sides of the membrane
C) are hydrophilic and face outward towards the aqueous solution on both sides of the membrane
D) are hydrophobic and face inward, shielded from water

88) Archaea are composed of _____ cells. 88) _____
A) eukaryotic B) prokaryotic C) animal D) bacterial

89) Which of the following structures is exclusively associated with prokaryotic cells? 89) _____
A) nucleoid B) chromosome
C) a membrane–bound nucleus D) ribosomes

90) The nucleoid region of a prokaryotic cell 90) _____
A) is surrounded by a nucleoid membrane. B) contains the cell's nucleoli.
C) separates the RNA from the cytoplasm. D) contains the cell's DNA.

91) _____ cells lack a membrane–enclosed nucleus. 91) _____
A) Eukaryotic B) Fungal C) Plant D) Prokaryotic

92) A bacterial cell's DNA is found in its 92) _____
A) nucleus. B) nucleoid region.
C) capsule. D) ribosomes.

93) Which of the following structures are used by prokaryotes for attaching to surfaces? 93) _____
A) flagella B) capsule
C) anchoring junctions D) nucleoid

94) The membranous compartmentalization of a cell 94) _____
A) allows different chemical conditions to be maintained in different parts of the cell.
B) requires the presence of a cell wall.
C) divides the cell into two equal–sized halves.
D) is common to both prokaryotes and eukaryotes.

95) Which of the following statements about internal membranes in eukaryotic cells is *false*? 95) _____
A) In eukaryotic cells, internal membranes form membranous compartments called organelles.
B) In eukaryotic cells, internal membranes standardize the internal environment of all cellular organelles.
C) In eukaryotic cells, internal membranes provide an additional area for many metabolic processes to occur.
D) In eukaryotic cells, internal membranes greatly increase a cell's total membrane area.

96) You are told that the cells on a microscope slide are plant, animal, or bacterial. You look at them through a microscope and see cell walls and membrane–bound organelles. You conclude correctly that the cells 96) _____
A) are animal cells. B) are bacterial cells.
C) could be either plant or bacterial cells. D) are plant cells.

97) Unlike animal cells, plant cells have _____ and _____. Unlike plant cells, animal cells have _____. 97) _____

A) chloroplasts . . . cell walls . . . centrioles
B) centrioles . . . cell walls . . . large central vacuoles
C) chloroplasts . . . cell walls . . . a nucleus
D) centrioles . . . chloroplasts . . . cell walls

98) Which of the following statements about cellular metabolism is *false*? 98) _____

A) Cellular metabolism includes different processes that require different conditions.
B) Cellular metabolism can occur within organelles.
C) Cellular metabolism often occurs on the surfaces of internal membranes.
D) Cellular metabolism occurs in animal but not plant cells.

99) The nucleus of a cell 99) _____

A) is the primary location of protein synthesis.
B) is contained within the nucleolus.
C) contains DNA.
D) is surrounded by a single layer of membrane.

100) The complex of proteins and DNA in a nondividing cell is called 100) _____

A) a ribosome. B) a nucleolus. C) chromatin. D) a lysosome.

101) During cell reproduction, chromatin fibers coil up into structures called 101) _____

A) nucleoli. B) chromosomes. C) ribosomes. D) lysosomes.

102) The function of the nucleolus is 102) _____

A) intracellular digestion.
B) to manufacture polypeptides.
C) to store chromatin.
D) to manufacture ribosomal RNA.

103) Protein synthesis requires the use of mRNA, which 103) _____

A) must be made by the ribosomes.
B) is translated by the ribosomes into the amino acid sequences of proteins.
C) is made in the nucleolus.
D) carries the message to the nucleus to synthesize new DNA during cell division.

104) Which location in the cell is unlikely to contain ribosomes or ribosomal subunits? 104) _____

A) nuclear envelope
B) cytoplasm
C) endoplasmic reticulum
D) plasma membrane

105) Which of the following statements regarding the endomembrane system is *false*? 105) _____

A) The endomembrane system is involved in the synthesis, storage, and export of important molecules.
B) The endomembrane system is a system of interrelated membranes that are all physically connected.
C) The endomembrane system includes the nuclear envelope.
D) The endomembrane system includes the rough and smooth endoplasmic reticulum.

106) The endomembrane system includes all of the following organelles *except* the 106) _____

A) endoplasmic reticulum.
B) Golgi apparatus.
C) plasma membrane.
D) peroxisome.

107) An immune system cell called the plasma cell produces thousands of antibodies per second for release into the body. What type of intracellular structure would you expect to be very prominent within the cell? 107) _____

A) peroxisome
B) endoplasmic reticulum
C) microtubules
D) nucleus

108) Smooth endoplasmic reticulum 108) _____

A) produces proteins for cell membranes.
B) is the major site of carbohydrate synthesis in eukaryotic cells.
C) stores calcium ions in muscle cells.
D) helps assemble ribosomes for protein synthesis.

109) The two main functions of the rough endoplasmic reticulum are the production of 109) _____

A) membrane and proteins secreted by the cell.
B) mitochondria and proteins secreted by the cell.
C) ribosomes and steroid hormones.
D) hydrogen peroxide and steroid hormones secreted by the cell.

110) Secretory proteins are 110) _____

A) produced by ribosomes on the smooth endoplasmic reticulum.
B) chemically modified in the nucleus.
C) released from the cell through the plasma membrane.
D) produced by the cell for internal use.

111) The cells that produce hair contain a lot of _____, while the cells that produce the oils that coat the hair contain a lot of _____. 111) _____

A) smooth endoplasmic reticulum . . . rough endoplasmic reticulum
B) rough endoplasmic reticulum . . . smooth endoplasmic reticulum
C) microbodies . . . lysosomes
D) smooth endoplasmic reticulum . . . lysosomes

112) The Golgi apparatus 112) _____

A) stores, modifies, and packages proteins.
B) is composed of stacks of membranous vesicles that are continuous with one another.
C) strings together amino acids to produce proteins.
D) is the site of carbohydrate breakdown.

113) Which of the following statements regarding the Golgi apparatus is *false*? 113) _____

A) The Golgi apparatus serves as a molecular warehouse and finishing factory.
B) The Golgi apparatus works closely with the endoplasmic reticulum.
C) The Golgi apparatus modifies chemicals received from the endoplasmic reticulum.
D) The Golgi apparatus decreases in size when a cell increases its protein production.

114) Which of the following statements about lysosomes is *false*? 114) _____

A) Lysosomes destroy harmful bacteria engulfed by white blood cells.
B) Lysosomes fuse with food vacuoles to expose nutrients to lysosomal enzymes.
C) Lysosomes help to digest worn-out or damaged organelles.
D) Lysosomes synthesize proteins from the recycled amino acids.

115) When a cell is deprived of oxygen, its lysosomes tend to burst and release their contents into the cell. As a result of this, that cell will 115) _____
A) undergo cell division.
B) undergo self-digestion and die.
C) recycle damaged organelles.
D) produce replacement lysosomes.

116) Tay-Sachs disease results from the malfunction of 116) _____
A) mitochondria.
B) endoplasmic reticulum.
C) lysosomes.
D) nucleoli.

117) Tay-Sachs disease 117) _____
A) prevents the breakdown of glycogen.
B) involves damage to liver cells.
C) causes an accumulation of lipids in brain cells.
D) is due to the absence of an enzyme that digests polysaccharides.

118) Which of the following statements about the functions of a plant cell central vacuole is *false*? 118) _____
A) The central vacuole of a plant cell may store waste products.
B) The central vacuole of a plant cell may store poisons.
C) The central vacuole of a plant cell may digest chemicals for recycling.
D) The central vacuole of a plant cell may help increase the size of cells by absorbing water.

119) Contractile vacuoles 119) _____
A) are generally found in protists that inhabit salt water.
B) allow organisms to avoid dehydration by absorbing water from the environment.
C) prevent cells from bursting as a result of the influx of excess water.
D) help in the excretion of excess salt.

120) A manufacturing company dumps its wastes into a nearby pond. One of the wastes is found to paralyze the contractile vacuoles of certain protists. A biologist looking at individual samples of these organisms taken from the pond would find that they 120) _____
A) have died because wastes have built up in the cytoplasm.
B) have lost water and shrunk.
C) have gained water and burst.
D) have died of malnutrition.

121) Which organelle is involved in the catabolism of fatty acids and the detoxification of alcohol? 121) _____
A) peroxosome
B) ribosomes
C) Golgi apparatus
D) smooth ER

122) Insulin is a protein that is produced by pancreatic cells and secreted into the bloodstream. Which of the following options correctly lists the order of the structures through which insulin passes from its production to its exit from the cell? 122) _____
A) rough ER, Golgi apparatus, smooth ER, cell membrane
B) rough ER, transport vesicles, Golgi apparatus, vacuole, cell membrane
C) rough ER, lysosomes, transport vesicles, cell membrane
D) rough ER, transport vesicles, Golgi apparatus, transport vesicles, cell membrane

123) The function of mitochondria is 123) _____
A) intracellular digestion.
B) cellular respiration.
C) photosynthesis.
D) lipid synthesis.

124) Cyanide inhibits mitochondrial function; as a result, the rate of 124) _____
A) ATP synthesis increases.
B) photosynthesis increases.
C) ATP synthesis decreases.
D) protein synthesis increases.

125) The _____ of a mitochondrion is/are an adaptation that increases the surface area and enhances a mitochondrion's ability to produce ATP. 125) _____
A) intermembrane space
B) matrix
C) cristae
D) stroma

126) The function of chloroplasts is 126) _____
A) photosynthesis.
B) intracellular digestion.
C) cellular respiration.
D) lipid synthesis.

127) The stroma is the 127) _____
A) watery fluid enclosed by the inner membrane of a mitochondrion.
B) thick fluid enclosed by the inner chloroplast membrane.
C) space between the inner and outer membranes of a mitochondrion.
D) space between the inner and outer membranes of a chloroplast.

128) Mitochondria differ from chloroplasts in that mitochondria 128) _____
A) contain three different membrane-bound compartments, whereas chloroplasts contain two.
B) convert light energy from the sun to chemical energy, whereas chloroplasts convert one form of chemical energy to another.
C) contain membrane folds called cristae, whereas chloroplasts contain disk-like vesicles in stacks called grana.
D) are not found in plants, whereas chloroplasts are not found in animals.

129) The endosymbiosis hypothesis proposes that 129) _____
A) two cells merged into one cell, improving the enzyme function of the new cell.
B) two cells were juxtaposed and one benefited from the other.
C) a large cell engulfed and digested a smaller cell, exposing its enzymes for use by the larger cell.
D) a small cell lived inside a larger cell to the benefit of both cells.

130) The endosymbiosis hypothesis is supported by all of the following pieces of evidence, *except* the fact that 130) _____
A) chloroplasts have ribosomes like prokaryotes.
B) mitochondria use ATP like prokaryotes.
C) chloroplasts reproduce through a splitting process like certain prokaryotes.
D) mitochondria have circular DNA like prokaryotes.

131) Microfilaments differ from microtubules in that microfilaments 131) _____
A) are mainly composed of actin, whereas microtubules are composed of tubulin.
B) help to anchor organelles, whereas microtubules primarily function to help cells change shape and move.
C) are found only in plants, whereas microtubules are found in both plant and animal cells.
D) are thicker than microtubules.

132) Which of the following statements about the cytoskeleton is *false*? 132) _____

A) The cytoskeleton is composed of three types of fibers: microfilaments, microtubules, and intermediate filaments.
B) The cytoskeleton plays an important role in amoeboid motion.
C) The cytoskeleton helps to support cells.
D) Once laid down, the elements of the cytoskeleton are fixed and remain permanently in place.

133) Intermediate filaments 133) _____

A) support the inner mitochondrial membrane.
B) guide the movements of organelles.
C) guide the movements of chromosomes.
D) surround the nucleus.

134) A drug that interferes with microtubule formation is likely to completely disrupt 134) _____

A) the amoeboid motion of a cell.
B) contraction of muscle cells.
C) the function of lysosomes.
D) the movements of sperm cells.

135) Cilia differ from flagella in that 135) _____

A) cilia are anchored only in the proteins of the cell membrane, while flagella are anchored in a special structure called the basal body.
B) cilia contain nine microtubule doublets surrounding a central pair of microtubules, while flagella contain only nine microtubule doublets.
C) cilia are typically more numerous and shorter than flagella.
D) the protein filaments of cilia are "naked," while those of flagella are wrapped in an extension of the cell membrane.

136) A basal body is 136) _____

A) composed of nine microtubule doublets surrounding a central pair of microtubules.
B) composed of nine microtubule triplets surrounding a central pair of microtubules.
C) identical in structure to cilia.
D) similar in structure to centrioles.

137) Dynein feet 137) _____

A) are knobs of carbohydrate that are essential to the movement of cilia and flagella.
B) are the anchoring proteins in basal bodies.
C) are found on microtubules in cilia and flagella and cause movement by grabbing and pulling at adjacent microtubule doublets.
D) are present in cilia but not in flagella.

138) A woman is having trouble becoming pregnant. Examination of her partner's sperm indicates that dynein feet are missing from the flagella in his sperm cells. A physician explains that this could interfere with fertility by 138) _____

A) preventing the sperm from attaching to the egg cell.
B) preventing the sperm from swimming to the egg cell.
C) interfering with the attachment of the flagella to the sperm.
D) preventing the sperm from producing enough energy to power swimming.

139) Decreased fertility in men from developed countries may be related to 139) _____
A) decreased flagella motion due to inactivity.
B) decreased metabolic levels from overexposure to UV rays.
C) increased exposure to hormone–like chemicals in the environment.
D) increased sperm motility from multiple flagella.

140) Most animal cells are 140) _____
A) surrounded by a cell wall.
B) embedded in a lipid matrix.
C) embedded in an extracellular matrix.
D) attached to each other via plasmodesmata.

141) The extracellular matrix attached to cells via glycoproteins that then bind to _____ in the plasma membrane. 141) _____
A) dynein B) polysaccharides
C) integrins D) collagen

142) Which of the following would be most affected by a mutation that prevented cells from forming tight junctions? 142) _____
A) integrity of the inner lining of the digestive tract
B) attachment of cells to the surrounding matrix
C) direct flow of water and small molecules from one cell to another
D) attachment of the cytoskeleton to the inside of the plasma membrane

143) Skin cells are fastened into strong sheets by 143) _____
A) anchoring junctions. B) basal bodies.
C) tight junctions. D) communicating junctions.

144) It is essential for heart muscle cells to beat in a coordinated fashion. The cell junctions that would best facilitate this are 144) _____
A) tight junctions. B) anchoring junctions.
C) gap junctions. D) occluding junctions.

145) Which of the following statements about plant cell walls is *false*? 145) _____
A) Plant cell walls protect plant cells by forming an impermeable layer around the cell.
B) Plant cell walls are multilayered structures.
C) Plant cell walls consist of cellulose fibers embedded in a matrix of polysaccharides and proteins.
D) Wood is primarily composed of plant cell walls.

146) Which of the following statements regarding plasmodesmata is *false*? 146) _____
A) Plasmodesmata carry nutrients between plant cells.
B) Plasmodesmata carry chemical messages between plant cells.
C) Plasmodesmata are found in plants as well as some single–celled organisms.
D) Plasmodesmata penetrate plant cell walls.

147) Which of the following cell structures is associated with the breakdown of harmful substances or substances that are no longer needed by the cell? 147) _____
A) peroxisomes B) chloroplasts C) mitochondria D) centrioles

148) Which of the following statements regarding cells is *false*? 148) _____

A) All cells have DNA as their genetic material.
B) All cells have a cell wall.
C) All cells can interconvert forms of energy.
D) All cells are enclosed in a membrane that maintains internal conditions different from the surroundings.

149) A child dies following a series of chronic bacterial infections. At the autopsy, the physicians are startled to see that the child's white blood cells are loaded with vacuoles containing intact bacteria. Which of the following explanations could account for this finding? 149) _____

A) A defect in the Golgi apparatus prevented the cells from processing and excreting the bacteria.
B) A defect in the lysosomes of the white blood cells prevented the cells from destroying engulfed bacteria.
C) A defect in the cell walls of the white blood cells permitted bacteria to enter the cells.
D) A defect in the rough endoplasmic reticulum prevented the synthesis of the antibodies (defensive proteins) that would have inactivated the bacteria.

Answer Key
Testname: LEH REVIEW CELLS MEMBRANES AND ENZYMES

1) D
2) D
3) A
4) A
5) D
6) D
7) B
8) A
9) B
10) B
11) D
12) C
13) B
14) D
15) A
16) A
17) A
18) A
19) D
20) B
21) D
22) B
23) B
24) D
25) A
26) C
27) D
28) D
29) B
30) B
31) D
32) A
33) A
34) D
35) A
36) C
37) B
38) B
39) B
40) C
41) B
42) D
43) C
44) D
45) C
46) D
47) B
48) D
49) D
50) A

51) C
52) D
53) B
54) B
55) A
56) A
57) D
58) B
59) A
60) A
61) B
62) C
63) D
64) B
65) C
66) A
67) B
68) C
69) C
70) C
71) C
72) D
73) D
74) D
75) C
76) C
77) D
78) D
79) C
80) C
81) C
82) C
83) C
84) B
85) D
86) B
87) C
88) B
89) A
90) D
91) D
92) B
93) B
94) A
95) B
96) D
97) A
98) D
99) C
100) C

101) B
102) D
103) B
104) D
105) B
106) D
107) B
108) C
109) A
110) C
111) B
112) A
113) D
114) D
115) B
116) C
117) C
118) C
119) C
120) C
121) A
122) D
123) B
124) C
125) C
126) A
127) B
128) C
129) D
130) B
131) A
132) D
133) D
134) D
135) C
136) D
137) C
138) B
139) C
140) C
141) C
142) A
143) A
144) C
145) A
146) C
147) A
148) B
149) B