Exam

Name FORM A

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

1) The *active site* of an enzyme is 1) _____

A) the region of a product that detaches from the enzyme.

B) the region of an enzyme that attaches to a substrate.

C) the region of a substrate that is changed by an enzyme.

D) the highly changeable portion of an enzyme that adapts to fit the substrates of various reactions.

E) None of the choices are correct.

2) Insulin is a protein that is produced by pancreatic cells and secreted into the bloodstream. Which of the following choices best describes the route of insulin from its production to its exit from the cell? 2) _____

A) rough ER, transport vesicles, cell membrane

B) rough ER, lysosomes, transport vesicles, cell membrane

C) rough ER, transport vesicles, Golgi apparatus, transport vesicles, cell membrane

D) rough ER, Golgi apparatus, smooth ER, cell membrane

E) None of the choices are correct.

3) Which one of the following statements is *false*? The endomembrane system 3) _____

A) includes the rough and smooth endoplasmic reticulum.

B) divides the cell into compartments.

C) is a system of interrelated membranes that are all physically connected.

D) is involved in the synthesis, storage, and export of important molecules.

E) includes the nuclear envelope.

4) Small, nonpolar, hydrophobic molecules such as fatty acids 4) _____

A) easily pass through a membrane's lipid bilayer.

B) are actively transported across cell membranes.

C) require transport proteins to pass through a membrane's lipid bilayer.

D) very slowly diffuse through a membrane's lipid bilayer.

E) usually enter the cell via endocytosis.

5) Which one of the following is *not* found in prokaryotic cells? 5) _____

A) pili

B) a cell wall

C) a capsule

D) ribosomes

E) a membrane-bound nucleus

6) Cyanide inhibits mitochondrial function; as a result, the rate of 6) _____

A) ATP synthesis would decrease.

B) lipid synthesis would increase.

C) ATP synthesis would increase.

D) protein synthesis would increase.

E) photosynthesis would increase.

7) The function of chloroplasts is 7) _____

A) cellular respiration.

B) photosynthesis.

C) intracellular transport of proteins.

D) lipid synthesis.

E) intracellular digestion.

8) 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? 8) _____

A) plasma membrane cholesterols

B) plasma membrane phospholipids

C) cytoskeletal elements

D) plasma membrane proteins

E) cell-surface carbohydrates.

9) 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 9) _____

A) contains a higher concentration of solutes than the protozoan.

B) is isotonic to the protozoan.

C) is hypotonic to the protozoan.

D) is hypertonic to the protozoan.

E) None of the choices are correct.

10) Unlike animal cells, plant cells have _____ and _____. Unlike plant cells, animal cells have _____. 10) _____

A) chloroplasts . . . cell walls . . . centrioles

B) centrioles . . . cell walls . . . large central vacuoles

C) centrioles . . . chloroplasts . . . cell walls

D) chloroplasts . . . cell walls . . . a nucleus

E) chloroplasts . . . cell walls . . . cell membranes

11) Malathion and tetracycline are both enzyme inhibitors. Malathion is used to kill insects; tetracycline to kill bacteria. Malathion is more toxic to human cells than is tetracycline. Which of the following explanations for the difference in toxicity to human cells would be reasonable? 11) _____

A) Malathion binds to its enzyme reversibly; tetracycline binds to its enzyme irreversibly.

B) Malathion is a competitive inhibitor; tetracycline is a noncompetitive inhibitor.

C) Human cells do not contain the enzymes inhibited by malathion or tetracycline.

D) Human cells contain the enzymes inhibited by both compounds, but the enzyme inhibited by malathion is not metabolically crucial.

E) None of the choices are correct.

12) Glucose molecules provide energy to power the swimming motion of sperm. In this example, the sperm are changing 12) _____

A) chemical energy into potential energy.

B) kinetic energy into potential energy.

C) chemical energy into kinetic energy.

D) kinetic energy into chemical energy.

E) None of the choices are correct.

13) In the reaction A → B + C + heat, 13) _____

A) the potential energy of the products is greater than that of the reactant.

B) the potential energy of the products is the same as that of the reactant.

C) the potential energy of the products is less than that of the reactant.

D) there is a net input of energy.

E) entropy has decreased.

14) A child is hospitalized for a series of chronic bacterial infections and dies despite heroic efforts. At 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? A defect in the 14) _____

A) lysosomes of the white blood cells prevented the cells from destroying engulfed bacteria.

B) surface receptors of the white blood cells permitted bacteria to enter the cells.

C) rough endoplasmic reticulum prevented the synthesis of the antibodies (defensive proteins) that would have inactivated the bacteria.

D) cell walls of the white blood cells permitted bacteria to enter the cells.

E) Golgi apparatus prevented the cells from processing and excreting the bacteria.

15) The idea that all living things are composed of cells and that all cells come from other cells defines: 15) _____

A) cell theory.

B) central dogma.

C) the laws of inheritance.

D) inheritance of acquired characteristics.

E) organelle theory.

16) How does inhibition of an enzyme-catalyzed reaction by a competitive inhibitor differ from inhibition by a noncompetitive inhibitor? 16) _____

A) Competitive inhibitors change the enzyme's tertiary structure; noncompetitive inhibitors cause polypeptide subunits to dissociate.

B) Competitive inhibitors bind to the active site of the enzyme; noncompetitive inhibitors bind to a different site.

C) Competitive inhibitors bind to the enzyme reversibly; noncompetitive inhibitors bind to it irreversibly.

D) Competitive inhibitors interfere with the enzyme; noncompetitive inhibitors interfere with the reactants.

E) Competitive inhibitors are inorganic substances such as metal ions; noncompetitive inhibitors are vitamins or vitamin derivatives.

17) Plasmodesmata 17) _____

A) carry chemical messages between plant cells.

B) carry nutrients between plant cells.

C) are one type of cell junction in plants.

D) penetrate plant cell walls.

E) All of the choices are correct.

18) The functions of the central vacuoles of plant cells include 18) _____

A) storing pigments that will help attract pollinating insects.

B) storing waste products.

C) storing poisons.

D) helping increase the size of cells by absorbing water.

E) All of the choices are correct.

19) If placed in tap water, an animal cell will undergo lysis, whereas a plant cell will not. What accounts for this difference? 19) _____

A) the relative impermeability of the plant cell membrane to water

B) the fact that plant cells are isotonic to tap water

C) expulsion of water by the plant cell's central vacuole

D) the relative inelasticity and strength of the plant cell wall

E) the relative impermeability of the plant cell wall to water

20) The fluid mosaic model describes the plasma membrane as consisting of 20) _____

A) a phospholipid bilayer with embedded carbohydrates.

B) a protein bilayer with embedded phospholipids.

C) individual proteins and phospholipids that can drift in a phospholipid bilayer.

D) two layers of phospholipids with protein sandwiched between them.

E) carbohydrates, proteins, and phospholipids that can drift in the membrane.

21) Facilitated diffusion across a biological membrane requires _____ and moves a substance _____ its concentration gradient. 21) _____

A) energy and transport proteins . . . down

B) transport proteins . . . against

C) energy and transport proteins . . . against

D) energy . . . down

E) transport proteins . . . down

22) 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 22) _____

A) produce replacement lysosomes.

B) produce additional ER.

C) undergo self-digestion and die.

D) undergo cell division.

E) recycle damaged organelles.

23) 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 explanation offers the most logical reason for this action? 23) _____

A) Elevated body temperatures may denature enzymes. This would interfere with the cell's abilities to catalyze various reactions.

B) 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.

C) Elevated body temperatures easily break the covalent bonds linking biologically important molecules. This will cause a general breakdown of cell structures.

D) Elevated body temperatures cause molecules to vibrate more quickly and prevent enzymes from easily attaching to reactants. This would slow vital body reactions.

E) Elevated body temperature will increase reaction rates in the child's cells and overload the limited number of enzymes found in the cell.

24) Which one of the following statements is *false*? The Golgi apparatus 24) _____

A) modifies chemicals received from the endoplasmic reticulum.

B) decreases in size when a cell increases its protein production.

C) serves as a molecular warehouse and finishing factory.

D) works closely with the endoplasmic reticulum.

E) sorts molecules according to their destination.

25) All cells on Earth 25) _____

A) can interconvert forms of energy.

B) have DNA as the genetic material.

C) can interconvert chemical materials.

D) are enclosed in a membrane that maintains internal conditions different from the surroundings.

E) All of the choices are correct.

26) Plasma membranes are selectively permeable. This means that 26) _____

A) the plasma membrane allows some substances to enter or leave a cell more easily than others.

B) glucose cannot enter the cell.

C) plasma membranes must be very thick.

D) cholesterol cannot enter the cell.

E) anything can pass into or out of a cell as long as the membrane is intact and the cell is healthy.

27) Most of a cell's enzymes are 27) _____

A) nucleic acids.

B) carbohydrates.

C) lipids.

D) proteins.

E) amino acids.

28) Lysosomes 28) _____

A) destroy harmful bacteria engulfed by white blood cells.

B) help to digest worn-out or damaged organelles.

C) recycle materials within the cell.

D) fuse with food vacuoles to expose nutrients to lysosomal enzymes.

E) All of the choices are correct.

29) In 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? 29) _____

A) Water will enter the balloon.

B) Sucrose will enter the balloon.

C) Sucrose will leave the balloon.

D) Water will leave the balloon.

E) None of the choices will occur.

30) Diffusion does not require the cell to expend ATP. Therefore, diffusion is considered a type of 30) _____

A) active transport.

B) endocytosis.

C) phagocytosis.

D) exocytosis.

E) passive transport.

31) A steer must eat at least 100 pounds of grain to gain less than 10 pounds of muscle tissue. This illustrates 31) _____

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.

E) None of the choices are correct.

32) Which one of the following substances would have the most trouble crossing a biological membrane by diffusing through the lipid bilayer? 32) _____

A) O_2

B) a small, nonpolar molecule such as butane (C_4H_{10})

C) Na^+

D) CO_2

E) H_2O

33) Which one of the following processes is endergonic? 33) _____

A) cellular respiration

B) the synthesis of glucose from carbon dioxide and water

C) the breakdown of glucose

D) the release of heat from the breakdown of glucose

E) the burning of wood

34) Oxygen crosses a plasma membrane by 34) _____

A) passive transport.

B) active transport.

C) phagocytosis.

D) pinocytosis.

E) osmosis.

35) Which one of the following is *true* about the ATP molecule? 35) _____

A) It contains the six-carbon sugar hexose.

B) Extremely stable bonds link the second and third phosphate groups.

C) It contains two phosphate groups.

D) It contains a nitrogenous base molecule called adenine.

E) None of the choices are correct.

36) According to _____, energy cannot be created or destroyed. 36) _____

A) the first law of thermodynamics

B) Einstein's law of relativity

C) the third law of thermodynamics

D) Aristotle's first principle

E) the second law of thermodynamics

37) The ultimate source of nearly all energy available to life on Earth is 37) _____

A) photosynthesis.

B) sunlight.

C) electricity.

D) wind.

E) cellular respiration.

38) When an enzyme catalyzes a reaction, 38) _____

A) it raises the activation energy of the reaction.

B) it lowers the activation energy of the reaction.

C) it acts as a reactant.

D) it becomes a product.

E) None of the choices are correct.

39) A cell is exposed to a substance that prevents it from dividing. The cell becomes larger and larger. This situation 39) _____

A) should present no problem to the cell since it can continue to perform all other necessary functions.

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 because the surface area of the cell will increase as the volume of the cell increases.

D) should be beneficial since the cell will be able to divert the ATP normally used for cell division to other processes.

E) None of the choices are correct.

40) In eukaryotic cells, internal membranes 40) _____

A) form membranous compartments called organelles.

B) contain proteins essential for metabolic processes.

C) provide additional area where many metabolic processes occur.

D) greatly increase a cell's total membrane area.

E) All of the choices are correct.

Name: MEMBRANE1 Test: FORM A Date: CELLS

ID Number
mark only one bubble in each digit group

1st digit	0	1	2	3	4
	5	6	7	8	9
2nd digit	0	1	2	3	4
	5	6	7	8	9
3rd digit	0	1	2	3	4
	5	6	7	8	9
4th digit	0	1	2	3	4
	5	6	7	8	9
5th digit	0	1	2	3	4
	5	6	7	8	9
6th digit	0	1	2	3	4
	5	6	7	8	9

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

Form number 50060100

www.zip-scan.com

Feed this end into scanner slot with printed side facing collection tray.