Keystone Practice Test

11 **The plasma membrane of a cell consists of**

A protein molecules arranged in two layers with polar areas forming the outside of the membrane.

B two layers of lipids organized with the nonpolar tails forming the interior of the membrane.

C lipid molecules positioned between two carbohydrate layers.

D protein molecules with polar and nonpolar tails.

#1

13 **There are many different enzymes located in the cytoplasm of a single cell. How is a specific enzyme able to catalyze a specific reaction?**

A Different enzymes are synthesized in specific areas of the cytoplasm.

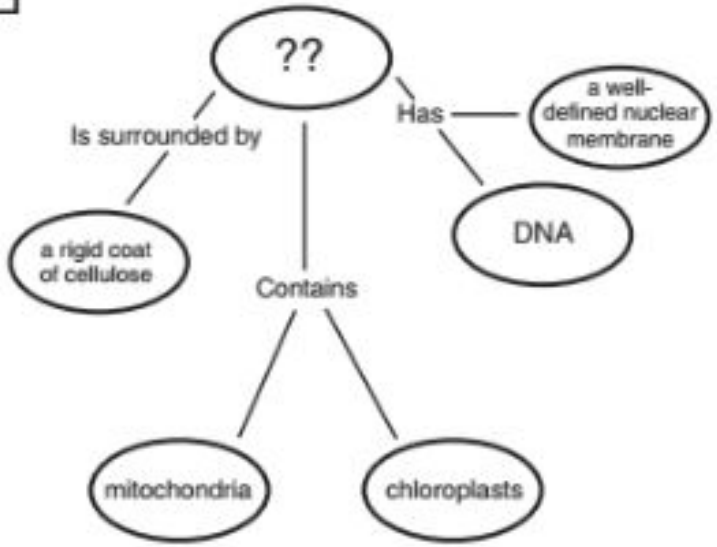
B Most enzymes can catalyze many different reactions.

C An enzyme binds to a specific substrate (reactant) for the reaction catalyzed.

D Enzymes are transported to specific substrates (reactants) by ribosomes.

#2

16



Which of these *best* completes this concept map?

A an animal cell

B a prokaryotic cell

C a virus

D a plant cell

#3

18 **Which cellular organelle is responsible for packaging the proteins that the cell secretes?**

A cytoskeleton

B cell membrane

C lysosome

D Golgi apparatus

#4

24 **Which of the following statements correctly describes meiosis?**

A Cells divide only once during meiosis.

B Meiosis does not occur in reproductive cells.

C The cells produced at the end of meiosis are genetically identical to the parent cell.

D The cells produced at the end of meiosis contain half the number of chromosomes as the parent cell.

#5

28 **Which of the following sequences represents chromosome number during fertilization?**

A $n + n \rightarrow 2n$

B $2n \rightarrow n + n$

C $n \rightarrow n$

D $2n \rightarrow 2n$

31 **In fruit flies, the gene for red eyes (R) is dominant and the gene for sepia eyes (r) is recessive. What are the possible combinations of genes in the offspring of two red-eyed heterozygous flies (Rr)?**

A RR only

B rr only

C Rr and rr only

D RR, Rr, and rr only

#7

37

5' ATCAGCGCTGGC 3'

The above sequence of DNA is part of a gene. How many amino acids are coded for by this segment?

A 4

B 8

C 12

D 20

39 **Which of these would *most* likely cause a mutation?**

A the placement of ribosomes on the endoplasmic reticulum

B the insertion of a nucleotide into DNA

C the movement of transfer RNA out of the nucleus

D the release of messenger RNA from DNA

42 **Although there are a limited number of amino acids, many different types of proteins exist because the**

A size of a given amino acid can vary.

B chemical composition of a given amino acid can vary.

C sequence and number of amino acids is different.

D same amino acid can have many different properties.

47 **Semi-conservative replication of DNA refers to the idea that**

A DNA molecules need to unwind before duplication begins.

B each new DNA molecule contains two new single RNA strands.

C the two strands of DNA molecules run in opposite directions.

D each half of the original DNA molecule is joined with a new complementary DNA strand.

49 **Genetic engineering has produced goats whose milk contains proteins that can be used as medicines. This effect was produced by**

A mixing foreign genes into the milk.

B injecting foreign genes into the goats' udders.

C inserting foreign genes into fertilized goat eggs.

D genetically modifying the nutritional needs of the goats' offspring.

51 **In a pond, the primary producer is a green alga, *Spirogyra*; the primary consumer is the crustacean, *Daphnia*; the secondary consumer is a small fish, the bluegill; and the tertiary consumer is a larger fish, the smallmouth bass. What changes can be expected in the pond if the *Daphnia* are killed with pesticides?**

A The *Spirogyra* population will probably die.

B The bluegill population will probably increase.

C The *Daphnia* population will eat something else.

D The smallmouth bass population will die.

58 **Which of these organisms would *most* likely be found at the bottom of a biomass pyramid?**

A giant squids

B sand sharks

C sea cucumbers

D green algae

62 **A healthy individual is a carrier of a lethal allele but is unaffected by it. What is the probable genotype of this individual?**

A two dominant normal alleles

B one recessive lethal allele and one dominant lethal allele

C one recessive lethal allele and one dominant normal allele

D one dominant lethal allele and one recessive normal allele

65 **Which of these *best* illustrates natural selection?**

A An organism with favorable genetic variations will tend to survive and breed successfully.

B A population monopolizes all of the resources in its habitat, forcing other species to migrate.

C A community whose members work together utilizes all existing resources and migratory routes.

D The largest organisms in a species receive the only breeding opportunities.

69 **A small population of chimpanzees lives in a habitat that undergoes no changes for a long period. How will genetic drift probably affect this population?**

A It will accelerate the appearance of new traits.

B It will promote the survival of chimpanzees with beneficial traits.

C It will increase the number of alleles for specific traits.

D It will reduce genetic diversity.

71 **A single species of squirrel evolved over time into two species, each on opposite sides of the Grand Canyon. This change was *most* likely due to**

A higher mutation rates on one side.

B low genetic diversity in the initial population.

C the isolation of the two groups.

D differences in reproductive rates.

75 **In order for the body to maintain homeostasis, the chemical decomposition of food to produce energy must be followed by**

A water intake.

B muscle contractions.

C waste removal.

D nervous impulses.

76 **Carbon dioxide is produced as cells break down nutrients for energy. Which of the following pairs of systems would participate in removing the carbon dioxide from the body?**

A endocrine and circulatory

B circulatory and respiratory

C respiratory and endocrine

D reproductive and excretory

Before mitosis begins, which happens before the nucleus starts dividing?

A The cytoplasm separates.

B The DNA replicates.

C The sister chromatids separate.

D The homologous chromosomes cross over.

#21

What is the function of autotrophs in the carbon cycle?

A to use oxygen to produce glucose

B to take in excess water

C to use carbon dioxide to produce glucose

D to feed on herbivores

Why is meiosis important for sexual reproduction?

A It allows the zygote formed from fertilization to have triple the chromosome number of the organism.

B It allows gametes to have twice the original number of chromosomes of the organism.

C It allows gametes to have half the original number of chromosomes of the organism.

D It allows the zygote formed from fertilization to have half the original number of chromosomes of the organism.

#23

How does the amount of energy resulting from fermentation compare with that of aerobic respiration?

A Aerobic respiration results in less energy.

B Aerobic respiration results in more energy.

C Each process results in equal amounts of energy.

D Each process results in variable amounts of energy.

#24

Which best explains why muscle cells are different from blood cells?

A A mutation occurs during the development of muscle cells but not in blood cells.

B Different genes are activated in muscle cells than in blood cells.

C Muscles cells experience different environmental influences than blood cells.

D Muscle cells are produced by the brain, but blood cells are produced by the heart.

j#25

A freshwater plant is placed in a container of saltwater. What will most likely happen to the cells of the plant?

A They will swell because water will move into them.

B They will swell because salt will move into them.

C They will shrink because water will move out of them.

D They will shrink because salt will move out of them.

#26

The yucca plant releases a strong scent at night when the yucca moth is active. The yucca moth, attracted by the scent, gathers pollen from the yucca flower. The yucca moth then deposits her eggs and the pollen on another plant. This ensures that the plant will be cross-pollinated and that the yucca moth larvae have a steady food supply. Which relationship does this best illustrate?

A commensalism

B mutualism

C parasitism

D predation

#27

Which environmental concern is most associated with burning fossil fuels?

A global climate change

B pollution of ocean waters

C ozone layer destruction

D decrease in levels of atmospheric carbon dioxide

#28

A segment of DNA has this sequence:

ATA GCA CAT GTA

What is the mRNA sequence transcribed from this segment?

A TAT CGT GTA CAT

B TAT GCT CTA GAT

C UAU CGU GUA CAU

D UAU GCU CUA CAU

The inheritance of short wings in Drosophila fruit flies is an x-linked, recessive trait. Which would most likely result if a short-winged female mates with a long-winged male?

A All offspring will be short-winged.

B All females will be long-winged, and all males will be short-winged.

C All females will be short-winged, and all males will be long-winged.

D Half of the males and females will be short-winged, and half will be long-winged.

#30

Which would most likely produce a mutation that is passed on to offspring?

A radiation changing the DNA sequence in skin cells

B a gamete with an extra chromosome forming

C tobacco smoke altering the genes in lung cells

D exposure to chemicals altering nerve cell function

#31

If energy is needed to move materials into or out of a cell, what is most likely occurring?

A active transport

B passive transport

C osmosis

D diffusion

#32

How are prokaryotic and eukaryotic cells similar?

A Both contain a nucleus.

B Both contain ribosomes.

C Both contain membrane-bound organelles.

D Both contain cell walls.

#33

How does DNA code for proteins in a cell?

A by creating a new double helix structure

B by using its phosphate and sugar molecules

C by adding more hydrogen bonds to its structure

D by arranging certain nitrogen bases of the cell in a particular order

How are sexual reproduction and asexual reproduction different?

A Sexual reproduction produces offspring identical to the parents, but asexual reproduction produces offspring with traits from both parents.

B Asexual reproduction produces offspring identical to the parents, but sexual reproduction produces offspring with traits from both parents.

C Sexual reproduction only occurs in multicellular organisms, but asexual reproduction only occurs in unicellular organisms.

D Asexual reproduction only occurs in multicellular organisms, but sexual reproduction only occurs in unicellular organisms.

#35

Which statement best compares aerobic and anaerobic respiration?

A Less ATP is generated during anaerobic respiration than during aerobic respiration.

B More water is generated during anaerobic respiration than during aerobic respiration.

C More oxygen is generated during anaerobic respiration than during aerobic respiration.

D Less lactic acid is generated during anaerobic respiration than during aerobic respiration.

#36

Which would be the best evidence that a cell is using active transport to move a substance across its cell membrane?

A Substances are moving rapidly across the cell membrane.

B ATP is being rapidly consumed near the cellular membrane.

C Substances are moving from high to low concentrations.

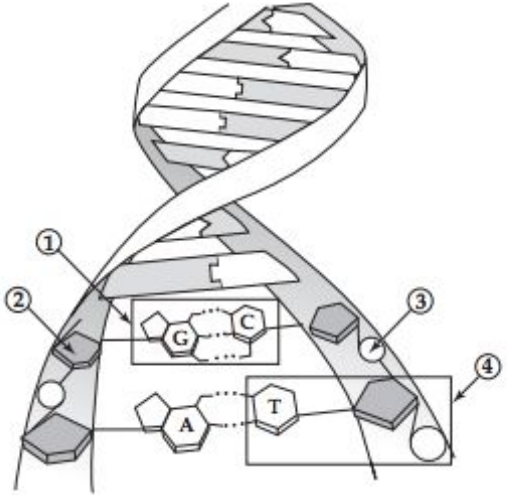
D Substances are moving through channels in the cell membrane.

#37

#38 and #39

Directions

Use the diagram below to answer Numbers 5 and 6.



5 **Which of these is a nucleotide?**

A 1

B 2

C 3

D 4

6 **Which of these is a sugar?**

F 1

G 2

H 3

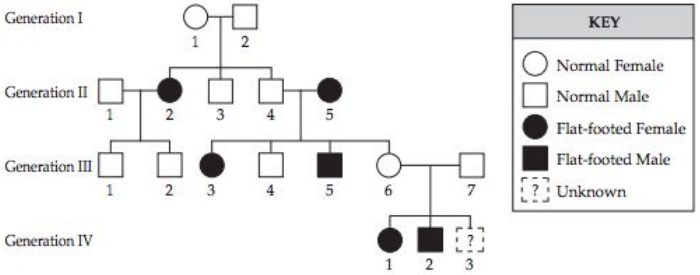
J 4

Directions

Use the information and the pedigree below to answer Numbers 24 through 26.

In humans, the allele for having feet with normal arches is dominant (A). The allele for flat feet is recessive (a). The pedigree below shows the occurrence of normal arches and flat feet in four generations of a family. In the pedigree, individuals are identified by the generation and individual numbers. For example, Individual 2 in Generation I is identified as I-2.

PEDIGREE FOR INHERITANCE OF NORMAL ARCHES



24 **Which of these individuals in the pedigree is a male with the genotype aa?**

F Individual I-1

G Individual II-2

H Individual III-2

J Individual III-5

25 **Individuals III-6 and III-7 have two children and are expecting a third child. Their two children have flat feet. What is the chance that the third child will have normal arches?**

A 25%

B 50%

C 75%

D 100%

26 **Which of these Punnett squares shows the cross between Individual II-4 and Individual II-5?**

F

	A	A
A		
a		

G

	A	a
a		
a		

H

	A	a
A		
a		

J

	A	A
a		
a		

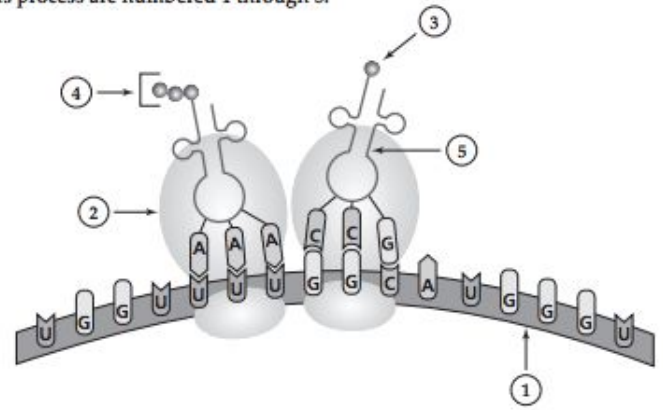
#40, #41, #42

#43, #44, #45

Directions

Use the information and the diagram below to answer Numbers 33 through 35.

Part of the process of protein synthesis is shown below. The different structures in this process are numbered 1 through 5.



33 **Structure 2 in the diagram represents a**

A ribosome
B mitochondrion
C protein
D chloroplast

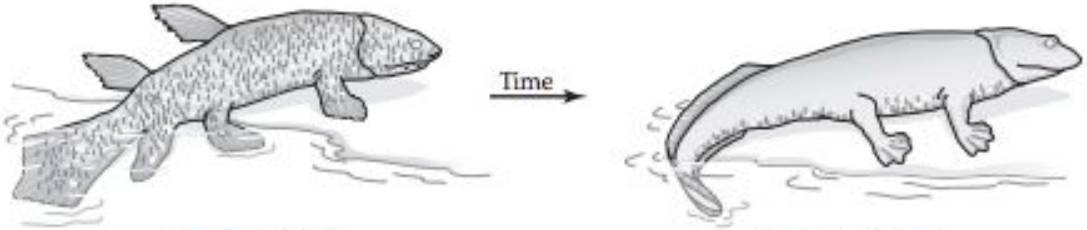
34 **The process shown in the diagram occurs in the**

F nucleus
G cytoplasm
H vacuole
J chromosome

35 **Structure 1 is produced in what part of the cell?**

A vacuole
B cytoplasm
C mitochondria
D nucleus

36 **Amphibians were the first vertebrates to live on land. The ancestors of amphibians were probably lobe-finned fish. The diagram below shows this development of amphibians over time.**



Which of these terms best describes how amphibians could have developed from lobe-finned fish?

F selective breeding

G cloning

H migration

J natural selection

#46

23 **Which of these is an example of homeostasis in a multicellular organism?**

A inheriting a trait

B growing larger and stronger

C building a nest

D regulating body temperature

14 **Scientists can insert and remove nucleotides from a DNA strand. Which of these identifies this process?**

F base pairing

G gene splicing

H DNA synthesis

J DNA transcription

11 **Scientists have found many similarities in the proteins of turtles and sharks. These similarities suggest that turtles and sharks**

A have stopped evolving

B have a common ancestor

C have all the same DNA sequences

D have the same number of chromosomes

4 **Which of the following is correctly matched with its function?**

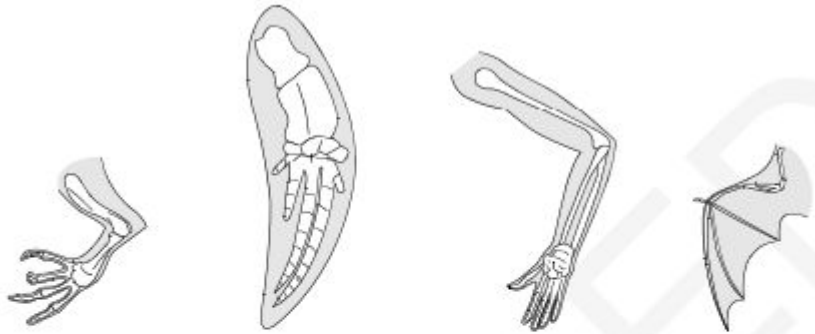
F rRNA – contains codes to make new ribosomes

G DNA – carries the amino acids to the ribosomes

H tRNA – combines with proteins to make up ribosomes

J mRNA – carries genetic codes from nucleus to the ribosomes

This diagram represents the bone structures of the front limbs of four different animals.



Frog Whale Human Bat

What do the similarities of the structures suggest about these organisms?

A They grow at the same rate.

B They live in the same environment.

C They live for the same length of time.

D They evolved from a common ancestor.

#51

Which set of parents can ***most likely*** produce a child with type O blood?

A one parent with type AB blood, and the other parent with type A blood

B one parent with type AB blood, and the other parent with type O blood

C one parent with heterozygous type A blood, and the other parent with type O blood

D one parent with homozygous type A blood, and the other parent with homozygous type B blood

#52

What process produces many variations in phenotypes?

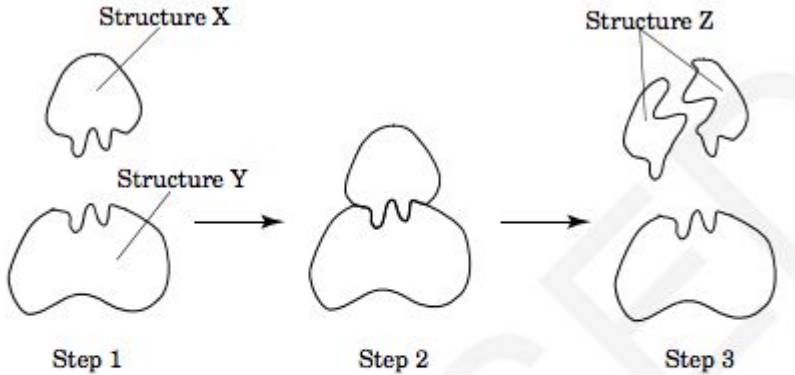
A independent assortment

B asexual reproduction

C regeneration

D cloning

This diagram shows an enzyme-substrate complex.



Which is represented by Structure X?

A substrate

B product

C enzyme

D complex

#54

What advantage do sexually reproducing organisms have over asexually reproducing organisms?

A genetic variation

B genetic stability

C increased fertilization rate

D increased reproductive rate

#55

Which is a use of genetically engineered bacteria?

A identifying the remains of an unknown person

B developing a DNA fingerprint for blood left at a crime scene

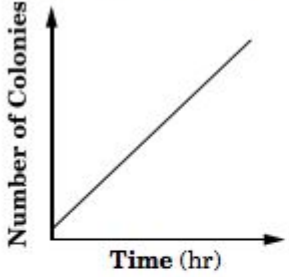
C making human insulin for diabetics

D producing corn that is resistant to herbicides

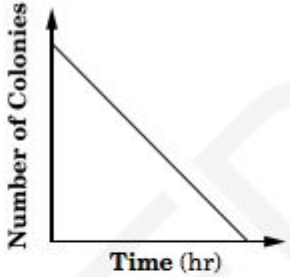
#56

Which graph represents the maximum carrying capacity of a bacterial colony?

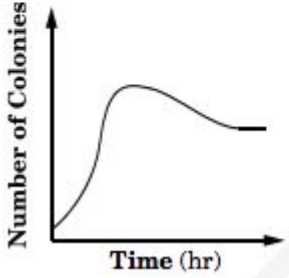
A



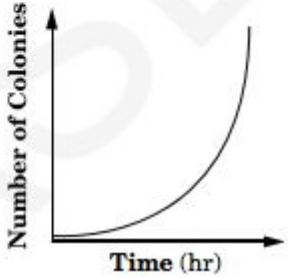
B



C



D



#57

In which way are photosynthesis and cellular respiration different?

A Cellular respiration stores ATP, while photosynthesis releases ATP.

B Cellular respiration produces oxygen, while photosynthesis uses oxygen.

C Photosynthesis releases energy, while cellular respiration stores energy.

D Photosynthesis uses carbon dioxide, while cellular respiration produces carbon dioxide.

#58

In humans, glucose is kept in balance in the bloodstream by insulin. Which concept does this ***best*** illustrate?

A adaptation

B homeostasis

C metabolism

D organization

#59

Which sequence shows increasing ecological levels of organization?

A organism, population, community, ecosystem

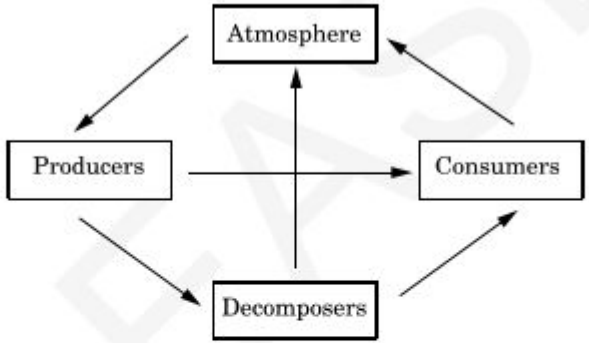
B ecosystem, population, organism, community

C community, ecosystem, population, organism

D population, organism, ecosystem, community

#60

This diagram shows the flow of carbon in a terrestrial ecosystem.



Which will ***most likely*** happen if the decomposers are removed from the carbon cycle?

A The amount of carbon dioxide in the atmosphere will increase.

B The amount of carbon dioxide in the atmosphere will decrease.

C The amount of carbon dioxide used by producers will increase.

D The amount of carbon dioxide needed by consumers will decrease.

#61

Answers

1.B

2.C

3.D

4.D

5.D

6.A

7.D

8.A

9.B

10.C

11.D

12.C

13.D

14.D

15.C

16.A

Answers

17.D

18.C

19.C

20.B

21.B

22.C

23.C

24.B

25.B

26.C

27.B

28.A

29.C

30.B

31.B

32.A

Answers

33.B

34.D

35.B

36.A

37.B

38.D

39.G

40.J

41.C

42.G

43.A

44.G

45.D

46.J

47.D

48.G

49.B

50.J

Answers

51.D

52.C

53.A

54.A

55.A

56.C

57.C

58.D

59.B

60.A

61.B