

**Test:** 2021 Biology NCE (MS)

### Question 1 of 75

Chloroplasts captures energy from the sun and

- A) converts it to chemical energy stored in food
- B) converts it into chemical energy stored in cytoplasm
- C) converts it heat energy to power cells
- D) converts chemical energy stored in food molecules into compounds for the cell to use.

### Question 2 of 75

Mitochondria are found in

- A) plant cells only
- B) animal cells only
- C) plant and animal cells
- D) all organisms except fungi

### Question 3 of 75

Lysosomes function is to

- A) store materials like water, proteins, and carbohydrates
- B) break down proteins and carbohydrates in the cell akin to a cleanup crew
- C) help the cell maintain its shape and assist in movement
- D) assemble proteins to run multiple functions in the cell

**Question 4 of 75**

Cell division occurs

---

- A) during prophase (beginning of cell cycle)
- B) by chromatids
- C) during anaphase
- D) at the end of the cell cycle

**Question 5 of 75**

Gametes form during process of

---

- A) mitosis
- B) meiosis
- C) telophase
- D) DNA replication

**Question 6 of 75**

When functions are too complicated to be carried out by tissues they are handled by

---

- A) organs
- B) receptors
- C) chromosomes
- D) anthromes

**Question 7 of 75**

How is solar energy and latitude related?

---

- A) the higher the latitude, the more direct the solar energy
- B) Southern latitudes 60-90 receives the most direct solar energy
- C) 0 degrees latitude receives the most direct solar energy
- D) Northern latitudes above 60 degrees receive the most solar energy

**Question 8 of 75**

Glass is to a greenhouse as \_\_\_\_\_ is to the greenhouse effect

---

- A) ozone
- B) the stratosphere
- C) oxygen
- D) carbon dioxide

**Question 9 of 75**

The independent variable is also called

---

- A) the controlled variable
- B) the manipulated variable
- C) the responding variable
- D) an inference

**Question 10 of 75**

A tentative explanation to observed phenomenon is

---

- A) a theory
- B) a scientific law
- C) a hypothesis
- D) a fact

**Question 11 of 75**

Which of the following is NOT an example of quantitative data

---

- A) male peacocks have colorful plumage
- B) The height of Dwayne Wade is 6'4"
- C) The new oak tree grew at a rate of 2 feet per year
- D) My art deco table has only 3 legs.

**Question 12 of 75**

An inference is

---

- A) a simple observation
- B) a statement that does not involve numbers
- C) a way to avoid scientific bias
- D) an interpretation of an observation

**Question 13 of 75**

A true scientific hypothesis

---

- A) must be measurable
- B) must be correct
- C) must be testable
- D) must be observable

**Question 14 of 75**

In order for published results to meet standards set by the scientific community it must be

---

- A) funded
- B) peer reviewed
- C) must be published within one year of the study
- D) correct

**Question 15 of 75**

Hair and nails are made of

---

- A) keratin
- B) thyroxine
- C) cysteine
- D) methionine

**Question 16 of 75**

How do sugars and amino acids differ?

---

- A) they are made of the same elements
- B) they are made of the same elements and amino acids also have phosphorus
- C) the only element in common is carbon
- D) They have the same elements except amino acids also have nitrogen

**Question 17 of 75**

The Grand Canyon itself would represent the

---

- A) hydrosphere
- B) biosphere
- C) geosphere
- D) atmosphere

**Question 18 of 75**

The climate zone closest to the equator is

---

- A) polar
- B) tropical
- C) temperate
- D) sub-polar

**Question 19 of 75**

Which of the following is NOT a primary factor affecting population growth

---

- A) population density
- B) birthrate
- C) emigration
- D) deathrate

**Question 20 of 75**

The population of humans as we approach 2050 is expected to be

---

- A) 7.5 billion
- B) 9 trillion
- C) 75 billion
- D) 9 billion

**Question 21 of 75**

When environmental conditions exceed the tolerance of organisms they may experience

---

- A) reproduction
- B) death
- C) stress
- D) carrying capacity

**Question 22 of 75**

What ecosystem service is provided by a salt marsh that helps prevent flooding?

---

- A) buffering
- B) carbon storage
- C) nutrient regulation
- D) pest reduction

**Question 23 of 75**

The amount of resources used by people in terms of land area is called

---

- A) diversity
- B) ecological footprint
- C) land- management
- D) resource regulation

**Question 24 of 75**

Long-term changes in average temperature, clouds, precipitation and frequency of extreme weather is called

- 
- A) global warming
  - B) monoculture
  - C) biological magnification
  - D) climate change

**Question 25 of 75**

Energy is the ability to

- 
- A) grow
  - B) reproduce
  - C) do work
  - D) photosynthesize

**Question 26 of 75**

What happens to the surface area to volume ratio as a cell grows?

- 
- A) It decreases.
  - B) It increases.
  - C) It doubles
  - D) It does not change

**Question 27 of 75**

Why do multicellular organisms have emergent properties?

- 
- A) They have more genes than unicellular organisms
  - B) Properties of unicellular organisms are enhanced by having many cells
  - C) All of their genes are expressed whereas unicellular organisms express only some
  - D) They show properties that can only result from the interaction of many cells

**Question 28 of 75**

What is a characteristic of the human Y chromosome?

- 
- A) It is made of DNA and histones covered by phospholipids
  - B) It contains some genes that are not present on the X chromosome
  - C) It is the largest chromosome in the human karyotype
  - D) It has a condensed length of approximately 100  $\mu\text{m}$

**Question 29 of 75**

Which example provides evidence of evolution?

- 
- A) White wings of a peppered moth turn black in industrial areas
  - B) Antibiotic resistant bacteria replace non-resistant bacteria over time
  - C) Some Galapagos finches' beaks become smaller during dry years
  - D) Polar bears are found in warmer latitudes following global warming

**Question 30 of 75**

What promotes natural selection?

- I. Overpopulation
- II. Competition
- III. Variation

- 
- A) I and II only
  - B) I and III only
  - C) II and III only
  - D) I, II and III

**Question 31 of 75**

Which structure found in eukaryotes has a single membrane?

- 
- A) Nucleus
  - B) Lysosome
  - C) Chloroplast
  - D) Mitochondrion



**Question 32 of 75**

What is required for a skeletal muscle to exert force?

---

- A) Extensor & flexor muscles
- B) Synovial joints
- C) Attachments to bones
- D) Ligaments

**Question 33 of 75**

What occurs in the body after the injection of a vaccine containing antigens?

---

- A) Activated B-cells divide to form memory cells.
- B) The receiver of the vaccine develops passive immunity.
- C) Helper T-cells produce specific antibodies.
- D) Macrophages are cloned and destroy the antigen.

**Question 34 of 75**

What is required to replicate DNA?

---

- A) Temperature of 37 °C
- B) Free nucleotides carrying A, C, G and T bases
- C) Plasmids
- D) Endonuclease

**Question 35 of 75**

What property makes water an important coolant in the natural world?

---

- A) It is cohesive.
- B) It requires much energy to evaporate.
- C) It has a lower temperature than blood.
- D) It has a low specific heat.

**Question 36 of 75**

Which can be explained by the solvent properties of water?

---

- A) Sodium chloride is transported as  $\text{Na}^+$  and  $\text{Cl}^-$  in blood.
- B) Movement of water occurs under tension in the xylem.
- C) Water is the coolant in sweat.
- D) Ice floats on liquid water.

**Question 37 of 75**

What is a community composed of?

---

- A) Habitats
- B) Populations
- C) Abiotic factors
- D) Biotic & abiotic factors

**Question 38 of 75**

What is a population?

---

- A) Organisms of the same genus living in an ecosystem
- B) Organisms living together and interacting in the same habitat
- C) Organisms of a species living together in the same area
- D) Organisms that can breed together

**Question 39 of 75**

What best describes the mode of nutrition of a heterotroph?

---

- A) It ingests only non-living organic matter.
- B) It obtains organic molecules from other organisms.
- C) It synthesizes its organic molecules from inorganic substances.
- D) It produces its organic molecules from chemical reactions using light.

**Question 40 of 75**

Which is an effect of protein denaturation?

- 
- A) The order of amino acids is changed when the protein overheats.
  - B) The bonds between amino acids are broken by condensation.
  - C) Parts of the protein become linked together by hydrolysis.
  - D) The three-dimensional structure of the protein is altered.

**Question 41 of 75**

The most abundant structural protein in the human body is found in ligaments and skin. What is the name of this protein?

- 
- A) Collagen
  - B) Hemoglobin
  - C) Myoglobin
  - D) Immunoglobulin

**Question 42 of 75**

What is a role of sulfur in living organisms?

- 
- A) Formation of proteins
  - B) Formation of carbohydrates
  - C) Formation of teeth
  - D) Transmission of nerve impulses

**Question 43 of 75**

What is a role of cholesterol in animal cells?

- 
- A) It increases body fat.
  - B) It controls membrane fluidity.
  - C) It lines the inner wall of capillaries.
  - D) It is a constituent of bile.

**Question 44 of 75**

Which process is possible due to the fluidity of cell membranes?

- 
- A) Endocytosis
  - B) Osmosis
  - C) ATP production
  - D) Cell recognition

**Question 45 of 75**

Which functions of life are carried out by all unicellular organisms?

- 
- A) Response, homeostasis, growth and photosynthesis
  - B) Metabolism, ventilation, reproduction and nutrition
  - C) Response, homeostasis, metabolism and growth
  - D) Reproduction, ventilation, response and nutrition

**Question 46 of 75**

What provides evidence for the endosymbiotic theory?

- 
- A) Mitochondrial DNA in eukaryotic cells
  - B) 70S ribosomes in prokaryotic cells
  - C) Gene transfer from prokaryotic cells to eukaryotic cells using plasmids
  - D) Prokaryotic cells (*Escherichia coli*) in the large intestine digest proteins

**Question 47 of 75**

How can the rate of photosynthesis be measured?

- I. By the amount of oxygen produced
- II. By the increase in biomass
- III. By the amount of carbon dioxide produced

- 
- A) I only
  - B) I and II only
  - C) I and III only
  - D) I, II and III

**Question 48 of 75**

Which process can be used to amplify small fragments of DNA?

- 
- A) Gel electrophoresis
  - B) Polymerase chain reaction
  - C) DNA profiling
  - D) Electron microscopy

**Question 49 of 75**

Which is a possible risk associated with a genetic modification of crops?

- 
- A) Crop plants will become weaker with time.
  - B) It can increase mutations in the organisms that consume them.
  - C) Starch obtained from genetically modified plants will be more difficult to digest.
  - D) Resistance to herbicide genes can be transferred to weeds.

**Question 50 of 75**

What is the composition of eukaryotic chromosomes?

- 
- A) DNA only
  - B) DNA & ribose
  - C) DNA & RNA
  - D) DNA & proteins

**Question 51 of 75**

What contributes to the enhanced greenhouse effect?

- 
- A) Ozone from violent thunderstorms
  - B) Carbon particles in diesel engine exhaust
  - C) Methane from agricultural sources
  - D) Carbon dioxide from active volcanoes around the world

**Question 52 of 75**

In ecosystems the amount of energy that passes from one trophic level to the next is called the conversion efficiency. What is the average conversion efficiency from primary to secondary consumers in most ecosystems?

- A) 1%
- B) 10%
- C) 50%
- D) 90%

**Question 53 of 75**

At each trophic level energy is lost. How is this energy regained by the ecosystem?

- A) Heat
- B) Nutrients
- C) Photosynthesis
- D) Recycling

**Question 54 of 75**

Which of the following is an example of a negative feedback loop?

- A) house thermostat turning heat on and off
- B) increasing temperature melting sea ice, which makes ocean absorb more heat which melts more ice
- C) drought causes plants to die off which causes less water vapor to be released into air, which causes less rain making drought worse, and more plants die
- D) blood clotting- when platelets arrive at injury site they release clotting factors that cause more platelets to be released.

**Question 55 of 75**

What percent of animal species are chordates?

- A) 1%
- B) 5%
- C) 25%
- D) 50%

**Question 56 of 75**

When coral kick out their symbiotic algae, in response to increasing temperature and acidity it is called

- 
- A) coal weakening
  - B) algal deterioration
  - C) coral bleaching
  - D) coral withering

**Question 57 of 75**

Ethology is

- 
- A) study of ethos
  - B) study of ecosystems
  - C) study of volcanoes
  - D) study of animal behavior

**Question 58 of 75**

Kidneys that conserve water are essential to homeostasis because

- 
- A) some animals live in dry or salty environments
  - B) cells will be unable to convert ammonia into urea if excess water is excreted
  - C) some animals drink water
  - D) urea and its by-products are not soluble in water

**Question 59 of 75**

Which of the following does not nourish their young with mother's milk

- 
- A) monotremes
  - B) sphenodontia
  - C) marsupials
  - D) placentals

**Question 60 of 75**

Which part of the brain is devoted to thought and memory

---

- A) cerebellum
- B) brain stem
- C) cerebrum
- D) medulla oblongata

**Question 61 of 75**

A skeleton made of fluid filled body segments that allow an animal to move is a(n)

---

- A) endoskeleton
- B) exoskeleton
- C) joints
- D) hydrostatic skeleton

**Question 62 of 75**

Body parts that have similar functions but different structure and development are

---

- A) analogous structures
- B) vestigial structures
- C) homologous structures
- D) embryological formations

**Question 63 of 75**

All species-living and extinct- are united by same ancient ancestor is the basis for

---

- A) Darwin's Law
- B) Principle of Common Descent
- C) Malthusian Principle
- D) Tragedy of the Commons



**Question 64 of 75**

The idea that organisms could change or evolve by using or not using various parts of their body was developed by

- A) Darwin
- B) Hutton
- C) Lamarck
- D) Malthus

**Question 65 of 75**

Which of the following is not a parameter of natural selection?

- A) more babies born than can survive
- B) there is a struggle for existence
- C) natural heritable variation affects ability to survive and reproduce
- D) traits are chosen for by specialty breeders

**Question 66 of 75**

For an organism to be able to survive and reproduce is called

- A) fitness
- B) adaptation
- C) artificial selection
- D) genetic bottleneck

**Question 67 of 75**

A complete diploid set of chromosomes grouped together in pairs and in order of decreasing size is a

- A) autosomal pairs
- B) karyotype
- C) codominant alleles
- D) spatial chromosomes

**Question 68 of 75**

Which of the following disorders does NOT result from nondisjunction in meiosis?

- A) Down Syndrome
- B) Turner's Syndrome
- C) Sickle Cell Disease
- D) Klinefelter's Syndrome

**Question 69 of 75**

Males are more likely to be colorblind because the allele for colorblindness is

- A) dominant and located on the X chromosome
- B) dominant and located on the Y chromosome
- C) recessive and located on the Y chromosome
- D) recessive and located on the X chromosome

**Question 70 of 75**

In a normal human karyotype, how many chromosomes are there?

- A) 46
- B) 23
- C) 2
- D) 44

**Question 71 of 75**

In order to take advantage of naturally occurring variation of organisms in order to pass them on to future generations is called ?

- A) inbreeding
- B) selective breeding
- C) mutation
- D) hybridization

**Question 72 of 75**

A genetically engineered substance put into transgenic rice has the potential to treat

---

- A) malaria
- B) high blood pressure
- C) vitamin A deficiency
- D) cancer

**Question 73 of 75**

In order to understand the activity levels of hundreds of genes at once, a scientist would likely use

---

- A) PCR
- B) DNA sequencing
- C) positive enzyme testing
- D) a DNA microarray

**Question 74 of 75**

The disruption of genetic equilibrium in a population as predicted by the Hardy-Weinberg Principle is caused by

---

- A) immigration of new individuals
- B) random mating
- C) large population sizes
- D) polygenic traits

**Question 75 of 75**

How do mineral ions in the soil move into the root?

---

- A) Osmosis
- B) Mass flow of water
- C) Translocation
- D) Through phloem