



Biology Examination IAC European Championships 2026

Instructions – Mark your answers on the scantron provided. Correct answers are worth 2 points. Incorrect answers are worth –1 point. Questions left blank are worth 0 points. Write the answer to your tiebreaker question in the box at the top of your scantron.

- Which of these animals is a mammal?
 - Goldfish
 - Whale
 - Snake
 - Eel
- Which of the following represents the correct hierarchical organization of life?
 - Cell → Organ → Tissue → Organism
 - Cell → Tissue → Organ → Organism
 - Tissue → Cell → Organ → Organism
 - Organism → Organ → Tissue → Cell
- What can the distance between footprints in a dinosaur trackway tell a paleontologist?
 - The name of the dinosaur
 - How fast the dinosaur was moving
 - What color eyes the dinosaur had
 - How loud the dinosaur could roar
- What organ pumps blood around the body?
 - Brain
 - Heart
 - Lungs
 - Stomach
- Which of the following is an organelle of the cell?
 - Thymine
 - Fructose
 - Nucleus
 - Lipid
- Amber is a golden material that sometimes traps ancient insects. What is amber made of?
 - Frozen yellow river water
 - Hardened tree resin or sap
 - Melted gold from volcanic eruptions
 - Crushed dinosaur teeth
- In a food chain, what do we call an organism that makes its own food using sunlight?
 - Producer
 - Consumer
 - Predator
 - Decomposer
- Which of the following physical features is almost entirely determined by genetics, with very little influence from the environment?
 - A person's hair length
 - A person's weight
 - A person's natural blood type
 - A person's ability to speak Spanish
- What is the largest organ of the human body that protects you from germs and helps control temperature?
 - The liver
 - The skin
 - The intestines
 - The muscles
- Which of these animals is capable of living on land and in water?
 - Frog
 - Dog
 - Kangaroo
 - Dolphin
- What color is the pigment chlorophyll?
 - Red
 - Purple
 - Blue
 - Green
- What are chromosomes primarily composed of?
 - Lipids and carbohydrates
 - DNA wrapped around proteins
 - Cellulose and starch
 - RNA and ATP

13. What do scientists call a fossilized footprint, nest, or burrow left behind by an animal?

- A. Body fossil
- B. Trace fossil
- C. Fake fossil
- D. Plant fossil

14. What is the primary purpose of a flower's bright colors and sweet smells?

- A. To hide from animals that want to eat it
- B. To attract pollinators like bees and butterflies
- C. To scare away dangerous pests
- D. To keep the plant warm at night

15. What major event do most scientists believe caused the extinction of the non-avian dinosaurs 66 million years ago?

- A. A massive asteroid impact and volcanic activity
- B. A giant flood that covered the whole planet
- C. Dinosaurs running out of water to drink
- D. Attacks from space aliens

16. What role is at the top of a food chain?

- A. Producer
- B. Decomposer
- C. Primary consumer
- D. Apex predator

17. Which of the following animals is classified as an invertebrate?

- A. Swan
- B. Crocodile
- C. Humans
- D. Earthworm

18. Which of these is an adaptation that helps a polar bear survive in the freezing Arctic?

- A. Large, thin ears
- B. The ability to swim in warm water
- C. A thick layer of blubber and fur
- D. Brightly colored skin

19. What are the reactants, or starting materials, required for photosynthesis to occur in plant cells?

- A. Carbon dioxide, water, and sunlight
- B. Oxygen and glucose
- C. Nitrogen, oxygen, and ATP
- D. Glucose and carbon dioxide

20. Which system in your body is made up of bones and provides support and shape?

- A. The muscular system
- B. The skeletal system
- C. The circulatory system
- D. The digestive system

21. Which type of microscopic germ can be treated and cured with a medicine called an antibiotic?

- A. Virus
- B. Bacteria
- C. Fungus
- D. Parasite

22. What do bees collect from flowers to make honey?

- A. Sap
- B. Water
- C. Sediment
- D. Nectar

23. What is the primary job of a vaccine?

- A. To instantly cure a person who is already very sick
- B. To sleep in your stomach and digest bad bacteria
- C. To replace old red blood cells with brand new ones
- D. To train the immune system to recognize a germ before it attacks

24. Which of these is an example of an inherited behavioral trait in animals, rather than a learned behavior?

- A. A dog sitting down when its owner says "sit."
- B. A sea turtle crawling toward the ocean right after hatching.
- C. A chimpanzee using a stick to fish for ants.
- D. A parrot speaking human words.

25. What are the tiny air sacs in the lungs where the exchange of oxygen and carbon dioxide takes place?

- A. Bronchi
- B. Trachea
- C. Alveoli
- D. Capillaries

26. Which of these prehistoric creatures was a flying reptile, but NOT technically a dinosaur?

- A. Pterodactyl
- B. Stegosaurus
- C. Brachiosaurus
- D. Ankylosaurus

27. Humans have 46 chromosomes in total inside most of their cells. How many chromosomes did you get from your biological father?

- A. 46
- B. 23
- C. 92
- D. 0

28. Which of these organs helps a fish breathe oxygen that is mixed into the water?

- A. Lungs
- B. Scales
- C. Gills
- D. Fins

29. Which of these is an example of an abiotic factor in an ecosystem?

- A. Bacteria
- B. Grass
- C. Insects
- D. Temperature

30. Which part of the human digestive system is primarily responsible for absorbing nutrients into the bloodstream?

- A. Pharynx
- B. Stomach
- C. Small Intestine
- D. Large Intestine

31. In a food web, what would happen if a primary consumer (like a rabbit) were removed from the ecosystem?

- A. The producers would decrease.
- B. The predators that eat rabbits would have less food.
- C. The decomposers would stop working.
- D. The amount of sunlight would decrease.

32. Asthma is a chronic disease that makes it hard for a person to breathe during a flare-up. What is happening inside the body during an asthma attack?

- A. The stomach fills up with too much air.
- B. The airways in the lungs become swollen and narrow.
- C. The heart stops pumping blood to the fingers and toes.
- D. The brain forgets to tell the mouth to open.

33. Which structure is found in plant cells but is not found in animal cells?

- A. Cell wall
- B. Cell membrane
- C. Cytoplasm
- D. Centrioles

34. Why do scientists use fruit flies to study how genes pass from parents to children instead of studying elephants?

- A. Fruit flies have the exact same number of bones as humans.
- B. Fruit flies do not have any DNA, making them easier to count.
- C. Fruit flies grow up and have babies very quickly, allowing scientists to see many generations.
- D. Elephants do not pass down any traits to their children.

35. What is an exoskeleton?

- A. A skeleton that grows inside the body
- B. A bone that never breaks
- C. A hard outer shell that protects animals like crabs and insects
- D. A map of an animal's muscles

36. If a scientist were to remove the mitochondria from a cell, which of the following would be the most immediate result?

- A. The cell would no longer be able to store water.
- B. The cell would lose its ability to produce energy.
- C. The cell would grow a thick cell wall.
- D. The cell would stop being able to hold its DNA.

37. Which of these invertebrates is known for having three hearts and blue blood?

- A. Octopus
- B. Jellyfish
- C. Earthworm
- D. Lobster

38. Which part of your body sends electrical messages between your brain and your muscles?

- A. Bones
- B. Blood vessels
- C. Nerves
- D. Teeth

39. If a doctor says a disease has become a "pandemic," what does that mean?

- A. The disease is very mild and acts like a normal cold.
- B. The disease has spread across multiple countries or worldwide.
- C. The disease can only infect household pets, not humans.
- D. The disease has been completely erased from the planet.

40. What is the jelly-like substance that fills the cell and holds organelles?

- A. Nucleus
- B. Cytoplasm
- C. Cell wall
- D. Mitochondria

41. What is the name of the "windpipe" that allows air to travel to your lungs?

- A. Esophagus
- B. Intestine
- C. Larynx
- D. Trachea

42. How do ectothermic animals, like lizards, regulate their body temperature?

- A. By shivering when they get too cold.
- B. By sweating through their skin when it is hot.
- C. By moving to sunny or shady spots in their environment.
- D. By burning fat stored in their tails.

43. If a child inherits a gene for blue eyes from their father, why might the child still end up with brown eyes?

- A. The mother must have passed down a dominant gene for brown eyes.
- B. The blue eye gene turned into a brown eye gene because of sunlight.
- C. Children only ever look like their mothers.
- D. Eye color is determined entirely by what a child eats.

44. What is the main job of the vacuoles in a cell?

- A. To create energy
- B. To act as storage areas for water and food
- C. To control the cell
- D. To protect the outside of the cell

45. What is the function of the cell membrane?

- A. Act as a selectively permeable barrier
- B. Synthesize protein
- C. Store genetic information
- D. Produce energy

46. Why are food webs considered more accurate models of an ecosystem than simple linear food chains?

- A. Food chains only show abiotic factors, while food webs show biotic factors.
- B. Organisms almost always eat only one specific type of food in nature.
- C. Most organisms eat, and are eaten by, multiple different species at various levels.
- D. Food webs prove that energy increases as you move up the trophic levels.

47. Diabetes is a chronic disease that affects how the body turns food into energy. Which organ in the body is most closely related to managing diabetes?

- A. Pancreas
- B. Heart
- C. Lungs
- D. Brain

48. What do we call a major change in an animal's body shape as it grows up, like a caterpillar turning into a butterfly?

- A. Hibernation
- B. Migration
- C. Metamorphosis
- D. Adaptation

49. The cell membrane is "selectively permeable." This means it:

- A. Allows everything to pass through.
- B. Allows nothing to pass through.
- C. Allows only certain substances to pass through.
- D. Is very thick.

50. Which of the following best describes a keystone species?

- A. A species that has a massive, critical impact on its ecosystem relative to its population size.
- B. The most abundant species with the highest biomass in an area.
- C. An invasive species that destroys the local food web.
- D. A pioneer species that grows on bare rock after a volcanic eruption.

51. Which of the following is considered a vector for transmitting diseases to humans?

- A. A clean metal spoon
- B. A warm winter jacket
- C. A flea or a tick
- D. A plastic water bottle

52. Insects use a special network of tubes to breathe since they do not have lungs. What are the tiny openings on the outside of their bodies called?

- A. Gills
- B. Spiracles
- C. Pores
- D. Stomata

53. In a standard biomass pyramid, why does the top trophic level always contain the least amount of total biomass?

- A. Top predators have a shorter lifespan.
- B. Energy is lost as heat at each trophic level.
- C. Apex predators consume only producers.
- D. Decomposers destroy energy at the top level.

54. What is the name of the strong, flexible tissue that acts as a cushion between bones at a joint?

- A. Tendon
- B. Ligament
- C. Cartilage
- D. Bone marrow

55. Cystic fibrosis is an autosomal recessive genetic disorder. If both parents are carriers of the cystic fibrosis gene, what is the probability that their child will inherit the disease?

- A. 25%
- B. 50%
- C. 75%
- D. 100%

56. Which structure allows unicellular organisms like the paramecium to sweep food towards their oral groove and move through their environment?

- A. Flagella
- B. Cilia
- C. Pseudopodia
- D. Chloroplasts

57. What is the primary role of nitrogen-fixing bacteria in the nitrogen cycle?

- A. Converting nitrogen gas into a usable form for plants
- B. Releasing nitrogen gas directly back into the atmosphere
- C. Absorbing sunlight to create glucose for the soil
- D. Decomposing dead animals into carbon dioxide

58. What makes a herpetologist different from an entomologist?

- A. A herpetologist studies birds, while an entomologist studies mammals.
- B. A herpetologist studies ocean life, while an entomologist studies land animals.
- C. A herpetologist studies reptiles and amphibians, while an entomologist studies insects.
- D. A herpetologist studies fossils, while an entomologist studies living organisms.

59. What type of joint allows for the greatest range of motion, such as in your shoulder or hip?

- A. Hinge joint
- B. Pivot joint
- C. Gliding joint
- D. Ball-and-socket joint

60. Some animals go into a deep sleep state during hot, dry summer months to conserve water. What is this process called?

- A. Aestivation
- B. Hibernation
- C. Migration
- D. Camouflage

61. If a disease is classified as an X-linked recessive disorder, which of the following statements is genetically accurate?

- A. Fathers pass the trait to all of their sons
- B. Mothers can only pass the trait to their daughters
- C. Males are more frequently affected because they only have one X chromosome
- D. It affects both sexes equally

62. Two different bird species eat the exact same type of seed on an island. Over time, one species develops a larger beak to crack larger seeds, while the other develops a smaller beak for smaller seeds. What ecological process occurred?

- A. Biomagnification
- B. Resource partitioning
- C. Parasitism
- D. Primary succession

63. The placebo effect is a well-documented phenomenon in medicine. Which of the following best describes how a placebo works?

- A. It triggers a physiological or psychological response based on the patient's expectation of healing, despite having no active medical ingredients
- B. It contains a low dose of the actual medication
- C. It cures the disease by speeding up cell division
- D. It only works on bacterial infections

64. A segment of DNA has the base sequence AGT-GCA. During transcription, what will be the complementary mRNA sequence?

- A. UCA-CGU
- B. TCA-CGT
- C. AGT-GCA
- D. TCU-CGU

65. A volcanic eruption completely destroys an island ecosystem, leaving only bare rock. Which organism is most likely to act as the pioneer species during primary succession?

- A. Dandelion
- B. Oak tree
- C. Lichen
- D. Fern

66. Which chemical messengers are produced by the endocrine system and travel through the bloodstream?

- A. Neurotransmitters
- B. Enzymes
- C. Hormones
- D. Antibodies

67. Which of the following is responsible for the folding, modifying, and transporting of proteins within the cell?

- A. Mitochondria
- B. Lysosome
- C. Endoplasmic reticulum
- D. Vacuole

68. If you place a red blood cell into a highly concentrated saltwater solution, what will happen to the cell?

- A. It will swell and burst
- B. It will shrink and shrivel
- C. It will stay the exact same size
- D. It will divide into two cells

69. During which phase of the cell cycle is the cell's DNA replicated in preparation for cell division?

- A. Prophase
- B. Interphase
- C. Metaphase
- D. Telophase

70. What is the name of the wave-like muscle contractions that push food down the esophagus?

- A. Peristalsis
- B. Absorption
- C. Mastication
- D. Circulation

Tiebreaker

This question will only be scored if there is a tie for placement on the exam. **This is a required question, but there is no penalty for a wrong answer to this question.**

Write your answer legibly in the space provided on your scantron.

How many bones are in a human skull?