

Envirothon Asia

Practice Questions

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This document is a curated selection of past Envirothon Asia questions to familiarize participants with the competition format. Students can use it for self-assessment, and advisers can employ it for internal selection. (Adviser please contact us for the answer key.)

- (2023, Aquatic Ecology) What is a trophic level?
 - A level of organization in an ecosystem
 - A level of pollution in the ocean
 - A level of fishing activity in a particular area
 - A level of ocean depth

- (2023, Aquatic Ecology) In photosynthesis, converting solar energy into chemical energy (sugar) is called energy ().
 - storing
 - fixing
 - generating
 - transforming

- (2023, Aquatic Ecology) What is the difference between a food chain and a food web?
 - A food chain is simpler than a food web
 - A food chain has more trophic levels than a food web
 - A food chain is more resilient to disturbances than a food web
 - There is no difference between the two

- (2023, Aquatic Ecology) What happens when a top predator is removed from a food web?
 - The prey population increases
 - The prey population decreases
 - The prey population stays the same
 - The prey's prey population increases

- (2023, Aquatic Ecology) What is the difference between a primary producer and a primary consumer?
 - Primary producers are photosynthetic while primary consumers are not

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- B) Primary producers are herbivores while primary consumers are carnivores
- C) Primary producers are at the base of the food web while primary consumers are at a higher trophic level
- D) Both A and C

6. (2023, Aquatic Ecology) In which way do wetlands improve water quality?

- A) By intercepting surface runoff and removing or retaining inorganic nutrients.
- B) By storing and slowly releasing surface water, rain, snowmelt, groundwater, and flood waters.
- C) By maintaining stream flow during dry periods.
- D) By purifying the ocean water

7. (2023, Aquatic Ecology) Wetlands are thought of as “biological supermarkets” because ().

- A) they support microbes and insectivorous plants
- B) they produce great quantities of food that attract many animal species
- C) they seldom have saturated or flooded soils
- D) they produce mostly birds and mammals, some of which are directly consumed by man.

8. (2023, Aquatic Ecology) Sediment management is an active intervention technique used for wetland restoration that involves:

- A) removing excess sediment from the wetland
- B) altering the water flow pattern in the wetland
- C) controlling sediment input to the wetland
- D) Both A and C

9. (2023, Aquatic Ecology) What is the goal of wetland restoration?

- A) To protect and maintain existing wetlands
- B) To return a degraded or destroyed wetland to a more functional and sustainable state
- C) To reduce nutrient pollution from surrounding lands
- D) To establish conservation easements

10. (2023, Aquatic Ecology) What is the purpose of vegetation restoration for wetland restoration?

- A) To promote the growth of native wetland vegetation
- B) To reduce the impact of sea-level rise on wetlands
- C) To improve water quality, reduce erosion, and provide habitat for wildlife
- D) All of the above

11. (2024, Aquatic Ecology) Which of the following is NOT a function of wetlands in improving water quality?

- A) Intercepting surface runoff

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- B) Removing inorganic nutrients
- C) Reducing suspended sediments
- D) Generating algal blooms

12. (2024, Aquatic Ecology) Wetlands help reduce the likelihood of flood damage by:

- A) Storing and slowly releasing surface water
- B) Impeding the movement of flood waters
- C) Both A and B
- D) None of the above

13. (2024, Aquatic Ecology) Which of the following is a correct combination of wetland functions? I. Flood protection, II. Water quality improvement, III. Recreation, IV. Wildlife habitat

- A) I, II
- B) I, III
- C) I, II, III
- D) I, II, III, IV

14. (2024, Aquatic Ecology) Which of the following is a correct statement about the economic benefits of wetlands for local communities?

- A) They generate significant revenue through tourism and recreational activities.
- B) They increase the biodiversity of the local ecology environment.
- C) They prevent the land from soil erosion.
- D) All of the above

15. (2024, Aquatic Ecology) Which combination of the following statements about wetlands and groundwater is correct? I. Wetlands maintain stream flow during dry periods. II. Wetlands replenish groundwater. III. The Floridian aquifer system is one of the least productive groundwater sources in the U.S. IV. Draining a Florida cypress swamp can significantly reduce available groundwater.

- A) I, II, IV
- B) I, III, IV
- C) II, III, IV
- D) I, II, III, IV

16. (2024, Aquatic Ecology) Based on the information in the article, which of the following statements about coastal wetlands is correct?

- A) Coastal wetlands are being restored in some states to buffer storm surges and protect shorelines.
- B) Coastal wetlands do not provide any protection against shoreline erosion.
- C) The economic benefits of coastal wetlands are minimal compared to inland wetlands.
- D) Coastal wetlands do not support any commercial or recreational fishing activities.

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17. (2024, Aquatic Ecology) Arrange the following statements in the correct order to describe the role of wetlands in shoreline erosion control: I. Wetlands absorb the energy of waves and break up the flow of stream or river currents. II. Wetlands occur at the margins of lakes, rivers, bays, and the ocean. III. Wetland plants hold the soil in place with their roots. IV. Wetlands protect shorelines and stream banks against erosion.

- A) II, III, I, IV
- B) III, I, II, IV
- C) II, IV, I, III
- D) IV, II, III, I

18. (2024, Aquatic Ecology) Which element does not have a gaseous form and is transformed by wetland plants from inorganic to organic forms?

- A) Nitrogen
- B) Sulfur
- C) Phosphorus
- D) Carbon

19. (2024, Aquatic Ecology) What is the primary reason for the degradation of wetlands when they receive too much surface runoff?

- A) Increased biodiversity
- B) Enhanced water filtration
- C) Soil compaction
- D) Nutrient overload

20. (2024, Aquatic Ecology) Which of the following is NOT a correct statement about the role of wetlands in the nitrogen cycle?

- A) Wetlands support microbes that function in nitrogen cycling.
- B) Wetlands release nitrogen into the atmosphere as a gas.
- C) Wetlands transform nitrogen into a form that is unavailable to plants.
- D) Wetlands store nitrogen within their plant biomass.

21. (2023, Forestry) In which direction does the cambium grow?

- A) From the inside out
- B) From the top down
- C) From the bottom up
- D) Both A and C

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22. (2023, Forestry) How should we count the age of a tree?

- A) Count the springwood
- B) Count the summerwood
- C) Either A or B
- D) Neither A nor B

23. (2023, Forestry) How does a diverse age structure of a forest benefit the ecosystem?

- A) It provides a range of microhabitats for different species
- B) It reduces the risk of forest fires
- C) It promotes forest resilience to disturbances
- D) Both A and C

24. (2023, Forestry) What is the significance of the age structure of a forest for carbon sequestration?

- A) A diverse age structure of a forest can sequester more carbon than a single age class forest
- B) A single age class forest can sequester more carbon than a diverse age structure forest
- C) Younger forests are more efficient at absorbing carbon dioxide because younger trees have a higher photosynthetic rate
- D) Older forests can store carbon for longer periods of time because old trees have more biomass.

25. (2023, Forestry) What is the significance of understanding the age structure of a forest for predicting future forest dynamics?

- A) It can help predict how forests may respond to future disturbances
- B) It can predict when and what kind of disturbance will happen in the future
- C) It can determine the timing and severity of the disturbance in the past
- D) All of the above

26. (2023, Forestry) Which is NOT the method that trees regeneration themselves?

- A) Seeds
- B) Root suckers
- C) Leaves
- D) Stump sprouts

27. (2023, Forestry) Why does an invasion or increase of less disease-resistant tree species make a forest stand more susceptible to insect infestation and disease?

- A) They attract more insects and diseases
- B) They provide a better environment for insect and disease survival and reproduction
- C) They release pheromones that attract insects and disease
- D) They produce more woody debris that serves as fuel for hotter-burning fires

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28. (2023, Forestry) Which of the following is an example of mechanical control of invasive plants?

- A) Using herbicides
- B) Planting native species
- C) Mowing
- D) Reducing disturbance

29. (2023, Forestry) What is the role of disturbance in forest succession?

- A) To promote the growth and establishment of invasive plants
- B) To create conditions that are less favorable for native plant growth and establishment
- C) To create opportunities for different plant species to grow and establish
- D) None of the above

30. (2023, Forestry) Why could invasive plants grow more rapidly than native species?

- A) Because they can alter soil chemistry and microclimate
- B) Because they have a higher photosynthetic rate and a greater capacity to uptake nutrients
- C) Because they can produce large quantities of seeds
- D) Because they were introduced intentionally by humans

31. (2024, Forestry) Evaluate the following statements about tree regeneration strategies: I. Sprouts originate from buds on the root systems. II. Vegetative layering is common in all tree species. III. Seed dispersal strategies vary widely across tree species. IV. Dormant buds on trees may grow when the parent tree dies or becomes sick.

- A) I and III are true, II and IV are false
- B) I and IV are true, II and III are false
- C) I, III, and IV are true, II is false
- D) All statements are true

32. (2024, Forestry) Which of the following statements about winter adaptations of trees is FALSE?

- A) Broadleaf trees drop their leaves to avoid problems of maintaining foliage in cold and dry conditions.
- B) Conifers have special adaptations, such as waxy coatings, to retain their foliage in winter.
- C) Trees undergo an acclimatization process to survive cold and dry winter conditions.
- D) Conifers have a physiological advantage over broadleaf trees in water transport during winter.

33. (2024, Forestry) Select the option that correctly matches the tree species with their expected lifespans: I. Sugar Maple II. Quaking Aspen III. Eastern Hemlock IV. Jack Pine A. 200-300 years B. 60-90 years C. 400-500 years D. 80-100 years

- A) I-A, II-B, III-C, IV-D
- B) I-C, II-A, III-B, IV-D

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- C) I-A, II-D, III-C, IV-B
- D) I-C, II-B, III-A, IV-D

34. (2024, Forestry) Which of the following is NOT mentioned as a potential source of water for conifers during winter?

- A) Soil
- B) Internal tree reservoirs
- C) Subnivean vapor absorption
- D) Melting snow

35. (2024, Forestry) Which of the following combinations correctly matches the winter adaptation strategies with their respective examples or mechanisms, as described in the article?

- A) Leaf drop - Broadleaf trees dropping leaves to avoid problems of maintaining foliage Acclimatization process - Increase in abscisic acid production and changes in cell membrane permeability Resolution of water issues - Conifers obtaining water from soil, internal reservoirs, or subnivean vapor Reducing mechanical damage - Conifers having a single leader and branches growing at obtuse angles
- B) Leaf drop - Conifers retaining needles with waxy coatings and tight stomatal closure Acclimatization process - Solute concentrations within cells increasing to reduce freezing point Resolution of water issues - Hardwoods diffusing water from cell to cell via the phloem Reducing mechanical damage - Conifers having dense foliage to protect internal trees from wind
- C) Leaf drop - Abscission layers forming between leaf stem and twig Acclimatization process - Proteins de-polymerizing and lipids becoming unsaturated Resolution of water issues - Water columns being restored through torus check valves in conifers Reducing mechanical damage - Snow and ice shedding through conical growth patterns in conifers
- D) All of the above

36. (2024, Forestry) The height advantage of trees becomes a liability in winter because it exposes _____ to the weather.


- A) roots
- B) bark
- C) tissues
- D) soil


37. (2024, Forestry) What is the primary reason for leaf drop in trees?

- A) To conserve water during winter.
- B) To prepare for spring growth.
- C) To reduce photosynthesis.
- D) To increase nutrient absorption.

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38. (2024, Forestry) Which statement is TRUE about the killing temperature in trees?
- A) All species have the same killing temperature.
 - B) Killing temperatures are limiting factors for species ranges.
 - C) Killing temperatures are not affected by species or tissue type.
 - D) Killing temperatures are always above freezing.
39. (2024, Forestry) Which tree regeneration strategy is most effective for species with a short lifespan?
- A) Seeds
 - B) Root Suckers
 - C) Stump Sprouts
 - D) Vegetative Layering
40. (2024, Forestry) What is the main challenge for conifers during winter water transport?
- A) Freezing temperatures
 - B) Lack of water sources
 - C) Broken water columns
 - D) Insufficient sunlight
41. (2023, Soil and Land Use) Which of the following factors influences the rate and magnitude of soil erosion by wind?
- A) Soil surface roughness
 - B) Climate
 - C) Vegetation cover
 - D) All of the above
42. (2023, Soil and Land Use) Which of the following factor is concerned with the lack of windbreaks?
- A) Vegetation cover
 - B) Unsheltered distance
 - C) Erodibility of soil
 - D) Speed and duration of wind
43. (2023, Soil and Land Use) Which of the following regions are more prone to soil erosion by wind?
- A) Regions with high flood and sparse vegetation cover
 - B) Regions with low rainfall and sparse vegetation cover
 - C) Regions of overgrazing and a high proportion of clay
 - D) Regions with low humidity and dense vegetation cover



44. (2023, Soil and Land Use) Which of the following is a practice of soil stabilization to prevent soil erosion by wind?

- A) Use drip irrigation or rainwater harvesting to help maintain vegetation cover
- B) Reduce tillage to reduce soil disturbance
- C) Add compost to the soil or use the straw to hold the soil surface
- D) Plant trees, shrubs, and grasses to reduce the wind velocity

45. (2023, Soil and Land Use) How does deforestation contribute to soil erosion by wind?

- A) By reducing soil fertility
- B) By making the soil less cohesive
- C) By exposing the soil to wind
- D) By increasing soil organic matter

46. (2023, Soil and Land Use) () is the identification of trends by systematically collecting quantitative data over time from permanently marked locations.

- A) Observing
- B) Monitoring
- C) Assessment
- D) Testing

47. (2023, Soil and Land Use) Which of the following is an objective of soil biological property assessment?

- A) To evaluate and document the progress toward management goals
- B) To detect changes for areas in the desired condition
- C) To identify areas at risk of degradation
- D) Both A and B

48. (2023, Soil and Land Use) Which of the following methods can be used to estimate soil microbial biomass?


- A) Soil respiration
- B) Soil CO₂ sensors
- C) Substrate-induced respiration (SIR)
- D) Fluorometric assay

49. (2023, Soil and Land Use) What are the applications of measuring soil biological properties in sustainable agriculture?

- A) Improving soil health and productivity.
- B) Monitoring the impacts of land management practices.
- C) Assessing the effects of land-use changes on soil functioning.
- D) All of the above.

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50. (2023, Soil and Land Use) Which of the following statement about the methods of measuring soil biological properties is correct?

- A) Microbial diversity can be estimated using SIR
- B) Fluorometric assay involves adding a substance to the soil that reacts with the enzyme and produces a color change
- C) The fumigation-extraction method measures the amount of carbon dioxide released from the soil by fumigating the soil.
- D) Chamber-based methods involve enclosing a section of soil with a gas-tight container and measuring the change in CO₂ concentration over time.

51. (2024, Soil and Land Use) What is the primary cause of sheet erosion?

- A) Raindrop splash
- B) Soil crust formation
- C) Rill erosion
- D) Wind erosion

52. (2024, Soil and Land Use) Which statement is FALSE regarding the impact of soil erosion on crop yields?

- A) Erosion can lead to a decrease in crop yields.
- B) Erosion can improve soil texture.
- C) Erosion can remove nutrients and organic matter.
- D) Erosion can affect seed and plant establishment.

53. (2024, Soil and Land Use) Which of the following is NOT a conservation measure to reduce soil erosion?

- A) Contour plowing
- B) Strip cropping
- C) Terracing
- D) Deep tillage


54. (2024, Soil and Land Use) Identify the FALSE statement regarding the effects of past erosion on soil erodibility:

- A) Exposed subsurface soils tend to be more erodible due to poorer structure and lower organic matter.
- B) Lower nutrient levels associated with subsoils contribute to poorer crop cover, providing less soil protection.
- C) Past erosion has no effect on a soil's erodibility.
- D) Many eroded sites have soils that were originally less erodible than the current exposed soils.

55. (2024, Soil and Land Use) Which soil texture is generally less erodible by water?

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- A) Silt
 - B) Clay
 - C) Sandy loam
 - D) Very fine sand

56. (2024, Soil and Land Use) What is the primary cause of stream and ditch bank erosion?

- A) Poor construction or maintenance of drainage systems
- B) Cropping too close to banks
- C) Uncontrolled livestock access
- D) All of the above

57. (2024, Soil and Land Use) Which of the following factors can increase soil erodibility?

- A) Compacted subsurface soil layers
- B) Poor soil structure
- C) Low organic matter levels
- D) All of the above

58. (2024, Soil and Land Use) Evaluate the following statements about the effects of gully erosion: I. Gullies are channels that interfere with field machinery operations. II. Gully formations result from improper outlet design for local drainage systems. III. Sloughing and slumping of bank slopes contribute to gully formation. IV. Gully control measures must consider the cause of increased water flow across the landscape.

- A) Only I and II are true
- B) Only II and III are true
- C) Only III and IV are true
- D) All statements are true

59. (2024, Soil and Land Use) Which of the following is NOT listed as a direct damage caused by stream and ditch bank erosion in the article?

- A) Loss of productive farmland
- B) Undermining of structures
- C) Washing out of lanes, roads, and fence rows
- D) Sedimentation in watercourses

60. (2024, Soil and Land Use) Identify the true statement regarding the effects of soil erosion:

- A) Sedimentation on downslope properties is an off-site effect of soil erosion.
- B) Crop yield reduction is an off-site effect of soil erosion.
- C) Pesticides and fertilizers can be carried off the site with eroded soil, causing off-site impacts.
- D) Textural changes in soil and weakened soil structure are off-site effects of soil erosion.

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61. (2023, Wildlife) What led to the evolutionary direction of pandas?

- A) Phylogenetic features
- B) Land isolation
- C) Eating habits
- D) Human invasion

62. (2023, Wildlife) Which of the following is correct about natural selection?

- A) Natural selection results in adaptation to past, present conditions, and future conditions.
- B) A favorable gene can have both advantageous and disadvantageous effects within the same individual.
- C) Natural selection acts only on the inherited components of an individual.
- D) Both B and C

63. (2023, Wildlife) What is the main reason for the diversity of bird beaks?

- A) Their adaptation to different ecological niches
- B) Genetic variation
- C) Their evolutionary history
- D) Their feeding strategy

64. (2023, Wildlife) What did the Grants find about the beak size and shape of the Galápagos finches?

- A) They were increasing constantly overtime
- B) They were not affected by environmental fluctuations
- C) They were heritable traits
- D) They were determined solely by feeding strategy

65. (2023, Wildlife) How can phylogeny influence the direction and rate of evolutionary change?

- A) By constraining the range of possible adaptations.
- B) By promoting genetic variation.
- C) By increasing the number of available ecological niches.
- D) By decreasing the impact of environmental factors.


66. (2023, Wildlife) What is convergent evolution?

- A) The process by which different species evolve similar traits
- B) The process by which one species evolves into another
- C) The process by which traits are lost over time
- D) The process by which genetic mutations occur

67. (2023, Wildlife) What is the best-known example of adaptive radiation?

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- A) Yellow-throated longclaw and western meadowlark
 - B) Penguins and Alcidae
 - C) Endemic honeycreepers of Hawaii
 - D) Darwin's finches on the Galapagos Islands

68. (2023, Wildlife) Why does convergent evolution occur?

- A) Because species want to become more like each other
- B) Because they share a common ancestor
- C) Because they live in similar environments and face similar challenges
- D) Because of random genetic mutations

69. (2023, Wildlife) How does the example of convergent evolution in bats and birds illustrate adaptation?

- A) Both have evolved wings as a way to fly and catch prey
- B) Both have evolved to live in trees and other high places
- C) Both have evolved to have feathers as a way to stay warm
- D) Both have evolved to have large ears to detect prey

70. (2023, Wildlife) How does convergent evolution challenge the idea of intelligent design?

- A) It shows that organisms can evolve without the need for a creator
- B) It shows that certain traits are necessary for survival, regardless of the designer
- C) It shows that species can evolve the same traits independently of each other, which suggests a natural rather than a supernatural process
- D) It shows that the process of evolution is random and unpredictable

71. (2024, Wildlife) What is the primary mechanism for evolutionary change described by Darwin?

- A) Mutation
- B) Genetic drift
- C) Natural selection
- D) Isolation

72. (2024, Wildlife) What is the term for the process where individuals best suited to their environment survive and reproduce?

- A) Adaptation
- B) Selection
- C) Coevolution
- D) Speciation

73. (2024, Wildlife) Which of the following is NOT a corollary of natural selection?

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- A) Adaptation to the environment
- B) Perfect adaptation to all conditions
- C) Inheritance of advantageous traits
- D) Survival of the fittest

74. (2024, Wildlife) What is the consequence of a species' extreme specialization?

- A) Increased survival
- B) Guaranteed adaptation
- C) Increased vulnerability to environmental change
- D) No effect on survival

75. (2024, Wildlife) Which group of animals is an example of convergent evolution?

- A) Marsupials and placental mammals
- B) Galapagos finches and Hawaiian honeycreepers
- C) Penguins and Alcidæ
- D) All of the above

76. (2024, Wildlife) Arrange the following elements in the correct order according to the process of natural selection: 1) Resource scarcity, 2) Genetic variation, 3) Competition, 4) Reproduction, 5) Selection.

- A) 1-2-3-4-5
- B) 2-1-3-4-5
- C) 1-3-2-4-5
- D) 2-3-1-4-5

77. (2024, Wildlife) Which statement is TRUE about the relationship between genotype and phenotype?

- A) The genotype is the total complement of genes, and the phenotype is the set of traits.
- B) The phenotype is the total complement of genes, and the genotype is the set of traits.
- C) The genotype and phenotype are interchangeable terms.
- D) The genotype is the interaction of genes with the environment, and the phenotype is the organism itself.

78. (2024, Wildlife) If a species of bird has a population size of 10,000 individuals, and it is known that the reproductive rate of a particular type within this population is 1.5 times higher than the average reproductive rate of the population, what can be inferred about the fitness of this particular type?

- A) Its fitness is higher than the average fitness of the population.
- B) Its fitness is lower than the average fitness of the population.
- C) Its fitness is equal to the average fitness of the population.
- D) No inference about its fitness can be made based on the given information.

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79. (2024, Wildlife) The article mentions that the distribution of animal groups like ____ and ____ attests to the breakup of the southern continent Gondwanaland.

- A) marsupials, penguins
- B) tree-ducks, parrots
- C) penguins, ratites
- D) marsupials, ratites

80. (2024, Wildlife) Which of the following statements about adaptive radiation is FALSE?

- A) Adaptive radiation is the divergence of a single lineage to provide a variety of forms.
- B) Adaptive radiation involves the evolution of ecological and phenotypic diversity within a rapidly multiplying lineage.
- C) Darwin's finches on the Galapagos Islands are an example of adaptive radiation.
- D) Adaptive radiation refers to the convergence of different lineages to develop similar forms.