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10. Tourism development differs from all other development projects because of
    A. Its reliance on skilled human resource
    B. Its resource sophisticated equipment
    C. It is a major source of foreign exchange or currency
    D. Its dependence on untapped environment
    E. The involvement of local communities

11. Species richness tends to decrease with altitude. Which of the following is not believed to play some part in this trend?
    A. Higher altitudes are inclined to be younger in evolutionary terms
    B. Higher altitudes are inclined to occupy relatively small areas
    C. Productivity declines with altitude
    D. Higher altitude habitats tend to be isolated from one another
    E. Higher altitudes consist of poorer conditions which are markedly different from the ...

12. Which of the following ecosystems typically has the lowest temperature?
    A. Tundra
    B. Taiga
    C. Temperate forest
    D. Grassland
    E. Tropical forest

13. Conservation includes which of the following?
    A. Ecology and evolution
    B. Physiology and molecular biology
    C. Human social science and economics
    D. Politics
    E. All of the above

14. The distribution of the earth's major biomes is mainly determined by
    A. The specific geographic characteristics
    B. Temperature and the extent of human use or abuse
    C. The diversity of species it contains
    D. Precipitation and temperature
    E. Altitude and humidity

15. Biological diversity is
    A. The entire range of living species
    B. The genetic variations that occur among individuals with a species
    C. The biological communities of species
    D. The environments where the species live and interact
    E. All of the above

16. Which of these vegetation types cannot be found in Ghana?
    A. The Sudan savanna
    B. The south east outliers
    C. The fire zone dry semi-deciduous forest
    D. The Guinea savanna
    E. The Sahel savanna

17. The main advantage of *in-situ* conservation over *ex-situ* conservation is in res
    A. Its low labour requirement
    B. Its economy of space
    C. The non-requirement for controlled pollination and re-establishment
    D. Its potential for continued evolution
    E. Non-requirement for skilled human resources

29. Non-renewable natural resources are resources that are used at a faster rate that natural processes can never replace them.

30. Renewable natural resources can be replaced by natural processes faster than they are consumed and include forests, soils, water, wind, and natural gas.

31. Human consumption of natural resources is increasing globally largely due to increases in population and per capita demand.

31. In general, people in rich countries consume more natural resources and have narrower ecological footprints compared to their counterparts in poorer countries.

32. One way to prevent potential conflict between the aims of conservation and economic development is to recognize that both are geared toward enhancing the quality of living of humans, with the former being a prerequisite for the latter.

33. Construction of a dam or reservoir over a river is most likely to affect fishes that are benthic feeders due to the change from riverine conditions to lacustrine ones.

34. In addition to fishes, dam construction can exert considerable impacts on the spread of diseases and invasive plants.

35. Compared to temperate forests, tropical savannas experience higher temperature and rainfall.

36. The largest expanse of the tropical rainforest in Africa in found in West Africa.

37. The savanna ecosystem is important for world food security because it provides a suitable environment for rearing of livestock.

38. Ecotourism differs from conventional tourism because it always ensures that only a small number of visitors are admitted to the tourist site.

39. Ex-situ methods of conservation are generally preferred over in-situ methods because of the opportunity they provide for the continued evolution of species.

40. Botanic garden is an example of in-situ conservation method.

18. Biodiversity hotspots
   A. Are areas in the tropical rainforests which are greatly affected by anthropogenic disturbances
   B. Describe environments with many rare and endangered species
   C. Are areas with high biodiversity and threats
   D. Refers to protected area in the tropics
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19. The Living Plant Index (LPI)
   A. Is based on the IUCN threatened list
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   A. Tropical rainforest areas which are greatly affected by anthropogenic disturbances
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SECTION B: TRUE OR FALSE. Indicate whether the following statements are true or false. Write the correct option on your sheet of paper. Do not write any where on this question paper.

21. Biodiversity is generally recognized at three levels of organization namely genetic, species and population.

22. Biological fitness increases with reduced genetic diversity.

23. The number species on Earth is estimated to be up to 100 million of which 10 million have been described by scientists.

24. Ghana is home to over 3000 vascular plant species and over 700 bird species.

25. Globally, biodiversity exhibit both latitudinal and longitudinal gradients.

26. Species diversity can be measured at three scales namely, alpha diversity, Shannon diversity and beta diversity.

27. Approximately 99% of all species that ever lived are now believed to have gone extinct.

28. The current biodiversity crisis is the six of its kind but is unique from the previous in terms of the influence of human intervention.

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SECTION A: MULTIPLE CHOICE QUESTIONS. Answer all questions by writing the correct option (A-E) on a sheet of paper. Do not write anywhere on the question paper itself.

1. The greatest challenge to reversing the disappearance of the world's biological resources is
    A. Solid waste pollution.
    B. Introduction of exotic species.
    C. Habitat destruction.
    D. Extinction of the diversity of crop varieties and their wild relatives.
    E. Climate change.

2. Tropical rainforests
    A. Are the world's most biologically diverse ecosystem.
    B. Occupy less than 10% of the earth's land surface.
    C. Are dominated by woody plants and grasses.
    D. Are characterized by high temperatures and humidity, which are the same for all regions.
    E. All of the above.

3. Extinction is
    A. A natural process
    B. Caused by human influence
    C. The loss of an entire species from the planet
    D. B and C only
    E. A, B, and C are all correct.

4. One of the following is not an evidence of climate change.
    A. Shifts in species ranges
    B. Rising sea level
    C. Increased incidence of drought and fire
    D. Increased rate of desertification
    E. Increased human population

5. Compared to tropical rainforest soils, tropical savanna soils are _____ for agriculture because _____
    A. Better; they have more humus
    B. Better; they are less prone to leaching
    C. Worse; they are less fertile
    D. Worse; they have a long period of dryness
    E. Both A and B are correct

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KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY,
KUMASI
COLLEGE OF SCIENCE

B. Sc. (Theoretical & Applied Biology, and Environmental Science), Mid-Semester
Examination
Year Four, Semester Two

BIOL. 452 BIODIVERSITY UTILIZATION AND CONSERVATION

MARCH 2015   **TIME: 1 HOUR**

Attempt all questions

1. a) What is the meaning of the term genetic diversity? Give two examples. [4 points]

Genetic Diversity is the number of genes in individual
organisms of a species. Avoids Inbreeding and
epidemic Diseases measured by nucleotide differences,
gene diversity, allelic diversity. measured at these levels:
population, Community, Biomes. Eg①Social groups of Honey
②Breeds of livestock.

b) Briefly discuss the ecological implications or consequences of low genetic diversity or
loss of genetic diversity within a population of organisms. [6 points]

① It reduces biological fitness.
② It Creates greater chance for extinction.
③ It will cause disease epidemic.
④ It will lead to Inbreeding.
⑤ It will be difficult for different communities to
adapt to climate change
ensure that populations adapt to changing climate
Raw material for evolution and adaptation.

with good grazing lands for animals. This contributes to the supply of food to the world.

(a) [Entries ...] any four major characteristics of the tropical rainforest ecosystem. [2]

(i) It made up of continuous layered Canopy Cover. [2]

(ii) It supports animal life = Invertebrates, 90% of insects. variety of

(iii) It has high humidity, temperature and solar energy.

(iv) Biotic factors limits growth, biotic factors like Competition, pollination and it shows the relationship between plant, animal, climate and Soil.

c) Give *any three* reasons why you would not recommend the establishment of forest plantation as an alternative land use system in a tropical rainforest. [3 points]

① The Soil is infertile: Growth is limited by phosphorus, decomposition drives nutrient availability

② Clearing of forest will lead to CO_2 emissions thereby increasing temperature and affecting climate change.

③ Habitat Destruction: This will lead to alot of endangered species.

c) What is the importance of the savanna ecosystem or grassland to world food supply? Briefly describe how the activities of nomads may affect the capacity of this ecosystem to offer this important service. [5 points]

Excessive grazing can lead to changes in general structure, vegetation and the composition becomes less desirable. Some of the plants would have to tolerate a degree of use depending on the timing and intensity of that use.

Grazing would affect vegetation in 3 periods which are:

a) At the start of the growing Season: Plants would take nutrient from seeds drop from previous growing seasons.

b) After the main growth of the season has ended: The plant would mature, use at this time would cause the seed to therefore endangering reproduction.

) At the end of the growing seasons when plants are getting nutrients for the next season.

5. a) Based on the case study of the Volta Lake construction in the 1961, explain how the development of wetlands for economic purpose may affect the prevailing ecosystem. [4 points]

① Mormyroid Fishes dissappear from the fauna, because of their benthic feeding and the bottom of the lake was deoxyge nated. ✓

② Characids fishes varnished after prey moved upstream for spawning.

③ Cichlids throves, schilbeidea fish changed from bottom feed ing to crop the burrowing.

④ Ephemeropetra were on the deadwood trees and were taken by the rising river.

⑤ Changes in salinity, turbudity, and chemical changes affect the fish and shell fish.

b) How could such a development project be limited by ecological factors operating within the wetland ecosystems? [2 points]

It could be limited by ecological factors through the presence of unique species, bi product generated and the waste and pollution generated.

c) What is an estuarine? Describe any two adaptations required of organisms in order to live successfully in this environment. [4 points]

Plants on: Estuarine is a semi closed body of water with variable salinity, intermediate between freshwater and salt water. ✓

Plants should have a range of tolerance for salinity, moisture and temperature. ✓

Physiological adaptations, to thrive in edges of high salt anoxia and frequent tidal innudation. ✓

K ANNING

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