



CHUMEY HIGHER SECONDARY SCHOOL.  
BUMTHANG  
Trail Examination 2022



**Class X**  
**Environmental Science**

**Time: 2 Hrs**  
**Full marks: 100**

**Index Code.....**

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**Directions**

- ✓ The first 15 minutes of the examination are for reading the QA papers only. You must not start writing during this time.
- ✓ This paper has two sections A and B.
- ✓ Section A contains objective questions and all questions are compulsory.
- ✓ Section B contains extended response questions, wherein you have to answer any **SIX** out of **SEVEN** questions.
- ✓ The intended marks for questions are given in brackets ( ).

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**SECTION A (40 Marks)**

**Compulsory: Attempt all questions.**

**Question 1**

**a). Each question in this part is followed by four possible choices of answers. Choose the correct answer circle with PEN. (25 marks)**

i. Carbon is processed through biogeochemical cycle into the biosphere.

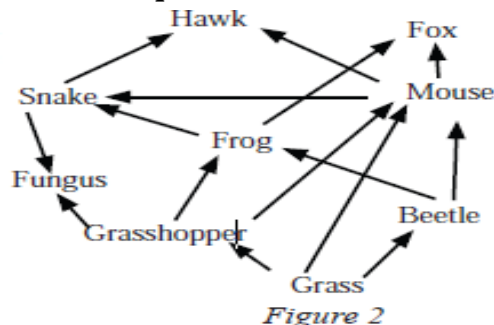
Which of the processes is not related to this?

- A. Transpiration.
- B. Photosynthesis.
- C. Burning of fossil fuels.
- D. Decomposition of plants and animals.

ii. What is the symbiotic relationship called in which one organism is benefited and the other organism is harmed?

- A. Mutualism.
- B. Parasitism
- C. Commensalism
- D. Consumer

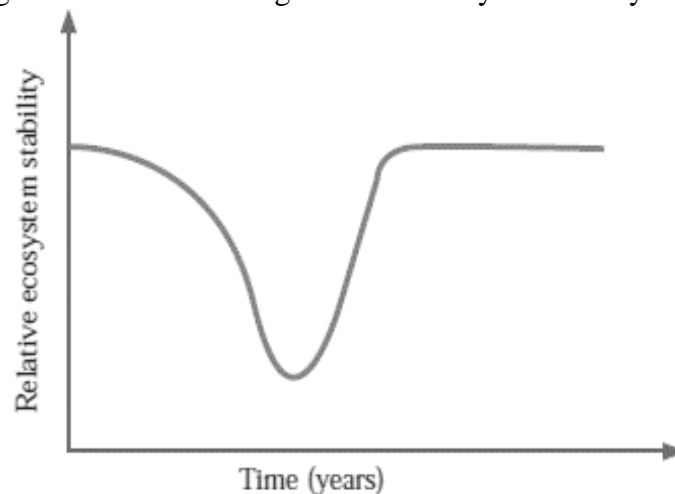
**(The following figure is to be used for question iii)**



- iii. Figure 2 shows a food web in an ecosystem. If a disease reduced the number of frogs in the food web, then the number of
- A. foxes would remain the same.
  - B. snakes would be reduced.
  - C. grasses would increase.
  - D. beetles would drop.
- iv. People use land for many purposes, such as extracting minerals, ecotourism, harvesting and rearing domestic animals. Which one of these purposes is the bio-productive area for production of food?
- A. Cropland.
  - B. Forest.
  - C. Ocean.
  - D. Rock.
- v. Ecology is under constant threat due to excessive use of natural resources and generation of waste and pollutants into the environment. The ecological status is better measured by
- A. built-up land.
  - B. forest land.
  - C. grazing land.
  - D. carbon footprint.
- vi. An ecosystem is easily damaged but recovers after some time when the damaging effect stops. Such an ecosystem has
- A. high stability and high resilience.
  - B. low stability and low resilience.
  - C. high stability and low resilience.
  - D. low stability and high resilience.
- vii. The natural resources are exploited extensively and over harvested to meet the economic developmental needs. Measures are taken at various levels to mitigate the overharvesting. Which one of the following is an example of mitigation measure at the national level?
- A. Demarcation of Nature Reserves, Wildlife Sanctuaries, and National Parks in the country.
  - B. Enactment of the Global Biodiversity Conservation Convention.
  - C. The Green Economy Policy of Bhutan.
  - D. Bhutan's Carbon Neutral Policy.
- viii. Which one of the following is NOT a limiting factor of an ecosystem?
- A. The amount of resources available in the ecosystem.
  - B. Amount of resources each individual is consuming.
  - C. The size of population.
  - D. Type of ecosystem.
- ix. A virus has rapidly spread in a village. It has impacted the health of the people living there and wiped out the whole population from the village. The above scenario best describes the
- A. biological disasters.
  - B. geophysical disasters.
  - C. climatological disasters.
  - D. hydro-meteorological disaster.

- x. After an earthquake, there are activities like rescue, relocation, providing food and water. The multi-agency provides these facilities to
- A. meet the basic needs of people.
  - B. improve transportation facilities.
  - C. warn aftershock of an earthquake.
  - D. restore the telecommunications facilities.
- xi. A greenhouse gas that is entirely anthropogenic in origin is
- A. CFCs.
  - B. methane.
  - C. nitrous oxide.
  - D. water vapour.
- xii. Select the best example that describes the impact of climate change on the ecosystem.
- A. Hibernation of animals during winter.
  - B. Flowering of apple trees during spring season.
  - C. Decrease in the habitat of plants and animals due to urbanization.
  - D. Decrease in the habitat of plants and animals due to floods and droughts.
- xiii. Which one of the following would NOT be affected by the depletion of the ozone layer?
- A. the rate of skin cancer.
  - B. biogeochemical cycles.
  - C. amount of greenhouse gases.
  - D. amount of UV rays reaching the Earth.
- xiv. Consumption is the use of goods and services by an individual, while production is the rate of generation of resources. The availability of resources influences the consumption, and therefore affects the
- A. resources people consume daily.
  - B. spiritual wellbeing of the people.
  - C. wealth of the people.
  - D. lifestyle of people.
- xv. The populations of organisms such as insects grow logistically when
- A. resources are limited.
  - B. resources are unlimited.
  - C. standards of living are low.
  - D. standards of living are high.
- xvi. An example of in-situ conservation effort of Bhutan is
- A. establishment of zoo.
  - B. practice of tissue culture.
  - C. establishment of gene bank.
  - D. creating of national conservation park.
- xvii. Waste management is a concern for all of us. Which one of the following is least desirable option for the waste option?
- A. Disposal.
  - B. Recycle.
  - C. Refuse.
  - D. Reuse.

- xviii. The energy derived from water and wind is considered as “Clean Energy”. It is because,
- there is minimum impact on the river system.
  - it is derived from natural resources.
  - energy sources are unlimited.
  - there is minimum pollution.
- xix. The hydropower system is one of the sources of greenhouse gases. Which of the following statement justifies this claim?
- The electromagnetic radiation affects the environment.
  - Forest is destroyed while constructing the dam.
  - The dam collects wastes from the upstream.
  - The decaying plants in the dam produce gas.
- xx. The developmental policy of Bhutan is based on the concept of “Middle Path”, targeting for a sustainable society with the ability to
- curtail all further development.
  - return to a more primitive style of living.
  - continue as always as assumes that things will work out for the best.
  - meet the needs of the present without compromising those of the future.
- xxi. All of the following are effective strategies adopted by Bhutan to maintain carbon neutral for all times, EXCEPT
- adoption of watershed management.
  - increasing protected areas and sanctuaries.
  - increasing the production of wind generated electricity.
  - enhancing the capacity to monitor the air and water qualities.
- xxii. The graph in Figure 3 shows the change in the stability of an ecosystem over a period of time



- Which statement best describes the change in ecosystem stability shown in the graph?
- A stable ecosystem can be altered, and then it can recover to a point of stability.
  - The stability of an ecosystem remains unchanged but its biodiversity decreases.
  - An ecosystem remains unchanged as its stability decreases.
  - A stable ecosystem cannot recover after it is altered.

- xxiii. The difference in lifestyle leads to inequality in
- A. deforestation.
  - B. consumption.
  - C. desertification.
  - D. conservation.
- xxiv. There is hardly any grass left in the grassland for the blue sheep to graze. This means that the grassland
- A. Blue sheep do not like the grass.
  - B. has reached its carrying capacity.
  - C. Blue sheep are being hunted for meat.
  - D. Snow Leopards are also around in the grassland.
- xxv. Pre-disaster planning will make the following possible
- A. The effective application of aid where prevention is not possible.
  - B. Self-sufficiency in dealing with natural hazards.
  - C. The prevention of the disaster.
  - D. All of the above.

**b) Fill in the blanks with appropriate words. (5)**

- i. Bhutan protects the biodiversity of critically endangered species by the establishment of.....
- ii. The systematic approach to identify, assess and reduce the risks of disaster is known as.....
- iii. In waste management practices 4R stands for Reduce, Reuse, Recycle and .....
- iv. Waste that has potential threats to public health is called.....waste.
- v. The use of materials products and energy in such a way that human needs can be met both for present and the future generation is termed as .....

**c) Match each item under Column A with the most appropriate item of Column B. Rewrite the correct pairs by writing the alphabet against the number. (5)**

Column A	Column B	Answer
A. Energy consumption	1. Greenhouse gases.	A=
B. Pandemic	2. Efficient use of energy	B=
C. Change in lifestyle	3. Balanced socio-economic development	C=
D. Chlorofluorocarbons	4. Biological disaster	D=
E. Gross National Happiness	5. More generation of waste	E=

**b) Write TRUE or FALSE against the following statements. (5)**

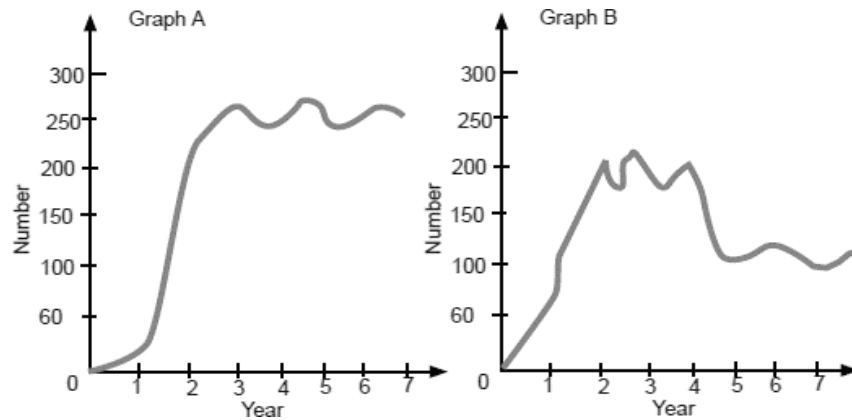
- i. Competition occurs when the niche of two organisms overlaps.[       ]
- ii. Wetlands support a wide variety of plants and animals; this means that they have great biodiversity. [       ]
- iii. One of the disadvantages of recycling waste is that the energy used during recycling process is more than the energy used to produce products from the raw materials.[       ]
- iv. Energy is one of the most fundamental components, which is responsible for the functioning of the universe.[       ]
- v. Hydropower development feasible in Bhutan as the country has perennial rivers. [       ]

**SECTION B (60 marks)**  
**ATTEMPT ANY SIX QUESTIONS**

**Question 2**

- a. What do you think will happen to the snake population in an area, if the frog and mice populations start to decrease gradually? (1)
- b. There are five tigers in a forest. Their only source of food is the 16 deer and 24 wild boars. Each tiger must eat an average of 35 Kg of meat per week. Killing of a deer produces an average of 25 Kg of meat, while that of a wild boar produces an average of 55 Kg of meat. Other things remaining constant, calculate the monthly carrying capacity of the forest in relation to the tigers? How long can the tigers survive under this condition? (3)
- c. What would be an impact of removing one species from an ecosystem? (2)

- d. Study the graphs that represent the carrying capacities at two situations, Graph A and Graph B, in Figure 2.8 and answer the question that follows:



- i. What are the carrying capacities shown by graph A and B in the 7<sup>th</sup> year? (2)
- ii. Which graph represents a stable carrying capacity? Why? (2)

### Question 3.

- a. Define the following terms: (2)
- Ecological Footprint.
  - bio-productive land.
- b. What are the main factors responsible for overharvesting of natural resources? (2)

c. Forest plays a dual role in influencing the Ecological Footprint. What are they? (2)

d. Discuss the factors that are responsible for the changes in lifestyle with reference to Bhutan. (2)

e. Explain four ways of controlling one's own Ecological Footprint. (2)

**Question 4.**

a. Why has Bhutan been able to conserve its environment better than most countries? (1)

b. What do you think are the possible reasons for increase in Black necked crane population in Phobjikha? Give at least two reasons. (2)



- c. Hundreds of kilometers of roads are constructed in Bhutan during the Five-Year Plans. Mention two of its effects on natural resources and their impacts on the environment? **(2)**

d. Study the Table and answer the question that follow:

Species	Ecosystem (N)	n(n-1)
Rabit	2	
Deer	8	
Tiger	1	
Wild Boar	1	
Total	12	

- i. Calculate n(n-1) and fill up the table ?(use rough work page at the end) **(2)**
- ii. Fin the Simpson's diversity index **(2)**

iii. What can you conclude regarding the species diversity. **(1)**

**Question 5.**

a. What are the causes of global warming? Mention two causes. (2)

b. Climate change may benefit some communities. Support this statement with appropriate examples. (2)

c. Human desire is the root cause of ozone depletion. Explain. In what ways, is ozone depletion different from the global warming? (3)

d. How does the global climate change influence biodiversity and the extinction of species? (2)

- e. How does environmental factor influence the phenophases of plants and animals? (1)

**Question 6.**

- a. How does in-situ promote the biodiversity conservation? (2)

- b. Greater biodiversity increases the stability of the ecosystem. Justify. (2)

- c. How does global warming cause loss of biodiversity? (2)

d. What are some of the economic benefits of the biodiversity? (2)

e. Explain the importance of traditional practices in biodiversity conservation? (2)

**Question 7**

a. Define climate change. (1)

b. How will global climate change influence ecosystems? (2)

c. How can a change in global average temperatures impact our lives? (3)

d. Rising of global temperature affects the mountainous country like Bhutan. Justify. (2)

- e. What are the objectives of Bhutan's initiative to remain carbon negative? (2)

**Question 8**

- a. Study Figure and answer the following questions.



- i. How do you think that this project would impact our economy? (1)

ii. How would these project impact the social lives of the community? **(1)**

iii. What environmental threats can you foresee in this project? **(2)**

iv. Do you think that this project is sustainable? Justify. **(2)**

b. Organic farming is one of the means for sustainable development. Justify. **(2)**

c. Practicing sustainable consumption can ensure that the environment has resources available for the future. How do the following contribute to sustainable development?

i. practicing refuse, reduce, reuse and recycle. **(1)**

ii. using renewable energy sources, such as solar or wind power. **(1)**

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