



CHUMEY HIGHER SCONDARY SCHOOL



Annual Examination, 2022

Sub: Environmental Science

Writing Time: 3 Hours

Class: XI

Full Marks: 100

Index Code.....

Directions

- ✓ The first 15 minutes of the examination are for reading the paper only. Students 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 **ALL SIX** questions.
- ✓ The intended marks for questions are given in brackets ()

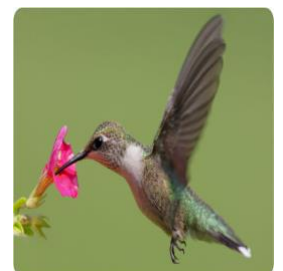
SECTION A (40 Marks)

Compulsory: Attempt all questions

Question 1

- a. Read the following questions carefully. For each question, there are four alternatives A, B, C and D. Choose and **CIRCLE** the most correct alternative with PEN. [20]
- i. What key role does the troposphere play in maintaining life on the Earth?
- A. Regulates weather
 - B. Absorbs UV radiation
 - C. Regulates ozone formation
 - D. Regulates ionization of gaseous molecules
- ii. Photosynthesis is equally important for both oxygen cycle and carbon cycle. The best reason that support the statement is
- A. photosynthesis cannot occur without carbon dioxide.
 - B. carbon dioxide is formed when carbon combines with oxygen.
 - C. plants are the only organisms that provide food for the animals.
 - D. carbon dioxide is used and oxygen is released during photosynthesis.

- iii. The characteristics of biomes are affected by different biotic and abiotic factors of an ecosystem. Which statement describes the two main factors that predominantly control the distribution of biomes?
- A. Plants and animals can survive in dry and high altitude conditions.
 - B. Plants and animals depend on temperature and water availability.**
 - C. Plants and animals have regenerative and resilience capability.
 - D. Plants and animals need flora and fauna for interaction.
- iv. Bhutan is perceived as a tourist attraction as it is a part of the 10 hotspots of biodiversity. The main type of ecosystem of Bhutan is terrestrial ecosystem, because Bhutan is
- A. rich in flora and fauna.
 - B. located in the Himalayas.
 - C. deprived of oceans and seas.
 - D. covered with large area of forest only.**
- v. Hydrophytes are adapted to abundance of water. One of the adaptive features to provide buoyancy to the plants is
- A. aerenchym that is extensive almost in all vegetative parts.**
 - B. collenchyma that is abundant in vegetative parts.
 - C. sclerenchyma that supports plant's body.
 - D. parenchyma that is found in leaves.
- vi. In the phosphorus cycle, phosphate becomes available by weathering of rocks first to
- A. consumers.
 - B. producers.
 - C. decomposers.
 - D. aquatic organisms.**
- vii. What happens to the population of a species after it reaches its carrying capacity?
- A. Increases linearly over time.
 - B. Remains relatively the same.**
 - C. Increases exponentially over time.
 - D. Decreases to zero in a very short period of time.
- viii. The picture along side shows a humming bird feeding on the nectar of a flower. This interaction is the best example of
- A. predation.
 - B. pollination.**
 - C. coevolution.
 - D. commensalism.



- ix. The biggest impacts are made on the environment by
- A. predation.
 - B. competition
 - C. **human interference.**
 - D. migration of organisms.
- x. Ecological footprint can be used as a tool to assess the
- A. living standard of people.
 - B. destruction of productive land area.
 - C. **level of human consume that pollutes the environment.**
 - D. impacts of consumption and lifestyle on the environment.
- xi. Which of the following is a point source pollutant?
- A. Pesticides
 - B. **Industrial sewage**
 - C. Agricultural runoff
 - D. Sediments from soil erosion
- xii. The change in phenophases of plants and animals are among most sensitive ecological response to
- A. **climate.**
 - B. weather.
 - C. habitat.
 - D. precipitation.
- xiii. Pressure Recorder is a tsunami warning device fixed at the base of the sea. It records
- A. seismic waves.
 - B. **change in water pressure at the base.**
 - C. change in weight of the water above it.
 - D. change in sea waves on the surface.
- xiv. Dhendup of class XI surveyed different species of flower in two areas of his school garden. The data collected are presented in the table given below.

Place	Flower Species	Abundance
A	<i>Gladiolus</i>	15
	<i>Gerbera</i>	18
	<i>Euphorbia</i>	18
B	<i>Gladiolus</i>	42
	<i>Gerbera</i>	4
	<i>Euphorbia</i>	6

Which one of the following is the correct conclusion for flower diversity in the school garden?

- A. More species diversity in place B.
- B. Place A has higher genetic diversity.
- C. Species abundance is different.
- D. More species diversity in place A.

xv. Gas molecules that absorb thermal infrared radiation and are present in large quantity to change climate system are known as

- A. solar radiations.
- B. infrared radiations.
- C. ozone gases.
- D. greenhouse gases.

xvi. The use of aluminum as can and plastics bottles have reduced drastically compared to the past 20 to 30 years. This is an example of

- A. reusing the waste.
- B. refusing the waste.
- C. reducing the waste.
- D. recycling the waste.

xvii. Incandescent light bulbs convert very little energy into visible light. Replacing them with compact fluorescent bulbs to use less energy is an example of an

- A. energy audit.
- B. energy management.
- C. energy security.
- D. energy efficiency.

xviii. If the ecological foot print of a person is 5, then it means

- A. bio - productive area is more.
- B. person's waste production is less.
- C. person's food consumption is less.
- D. person's food consumption is more.

xix. All the following are the types of bacteria involved in the nitrogen cycle EXCEPT

- A. Acetobacter.
- B. Rhizobium.
- C. Pseudomonas.
- D. Desulfavibrio.

d. Write TRUE [T] or FALSE [F] against the following statements. [7]

- i. The limiting factors of carrying capacity will always decrease the population. []
- ii. In the sanitary landfill, the waste is compacted and covered once the cell is being filled.[]
- iii. Dumping left over rice and other food items from your school mess into a fish pond is good for aquatic life. []
- iv. Webbed feet in penguin is an example of physical adaptation. []
- v. Human-Ecosystem interaction becomes unsustainable when coadaptation takes place. []
- vi. Toxic substances are always hazardous, but hazardous substances may not be toxic.[]
- vii. The interactions between spheres determine the climate of a place. []

SECTION B (60 Marks)

Attempt ALL the questions

Question 2

- a. Why do you think the tropical rain forest contains the maximum biodiversity than any other terrestrial biomes? [2]

- b. Provide three general reasons why biodiversity is worth maintaining. [3]

c. Give two kinds of environmental impacts that may result from the increased greenhouse effect. [2]

d. Every day, Class XI Arts generates 2 to 3 kg of waste from their class room and dumps in a pit to be burnt later on.

i. How does this affect the quality of air in the school? [1]

ii. What should XI Arts do with their waste? Illustrate with examples to show the use of 4R model to manage waste in the classroom. [2]

Question 3

a. Why do farmers not apply carbon in their field to grow their crops but often need to add fertilizer containing nitrogen and phosphorus? [2]

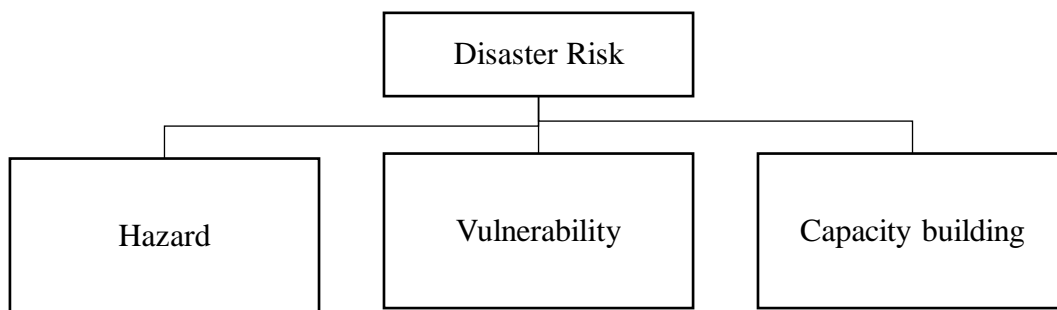
b. What are some of the health hazards related to solid waste? Mention at least four points. [2]

c. Describe four human activities which have led to global warming. [2]

d. Even though thermosphere lies further away from the mesosphere, it is the hottest. Explain. [2]

e. Categorize the following options under appropriate components of disaster risk in the flow chart given below. Options can be repeated if required. [2]

- | | |
|---------------------------|-------------------------|
| 1. Extreme climate change | 6. Physical environment |
| 2. Mitigation | 7. Property |
| 3. Economy | 8. Awareness |
| 4. Early warning system | 9. Community action |
| 5. Chemical industries | |



Answer

Question 4

- a. Differentiate between in-situ and ex-situ conservation. Give one example for each. [2]
- b. Of late, the concept of water flagship program is gaining attention to the people of Bhutan. Justify with three principles, the importance such program. [3]
- c. Construct a concept map to illustrate the interaction of lithosphere, hydrosphere and atmosphere to support biosphere. [3]

d. Define the following terms:

[2]

i. Seismograph

ii. Chemical oxygen demand (COD)

Question 5

a. Differentiate between the renewable and non-renewable resources with an examples.

[2]

b. What is meant by energy efficiency? Give two examples.

[2]

c. Read the extract given below and answer the questions that follow.

Overgrazing is also one of the causes for degraded watershed area. If the grazing continues and degradation fails to be curbed, watershed specialists fear the future could be bleak.

i. How will overgrazing cause the degradation of watershed? [2]

ii. If you were a local head of the community, what ways would you use to manage this degraded watershed? [2]

d. How do you relate the waste generation in the community to lifestyle of the people? [2]

Question 6

a. Disaster is not always a natural cause. Do you agree? Justify with two points. [2]

b. What could be the reasons for the increased extinction rates? Explain any **TWO** reasons. [2]

c. Why is climate important for the economy of the society? [2]

d. What is the significance of decomposers in an ecosystem? [2]

e. Explain any **TWO** advantages and **TWO** disadvantages of installing solar photovoltaic system in Bhutan. [2]

f. Collection of medicinal plants may cause biodiversity loss. Justify.

[2]

Question 7

- a. Segregation of waste at source and recycling of waste are preferred methods as it offers a chance of recovering valuable materials from the waste stream. How can Bhutan adopt these methods to minimise waste production? [2]

b. How would vulnerability, hazard and coping capacity determine the risk of the disaster? [2]

c. Suggest the standard auditing phase/steps in case of energy auditing. [3]

d. Managing the sewage treatment is a great concern in Bhutan and as well at Chumey HSS due to leakage in toilets. What are the some of the steps you will take as and environmental science students? Mention any **THREE**. [3]