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མུ་ཉིག་ཐང་འབྲིང་རིམ་སློབ་གྲྭ་གོང་མ།



MOTITHANG HIGHER SECONDARY SCHOOL THIMPHU THROMDE

“Every child is inspired to learn and empowered with wisdom to excel in life”

Trial Examination, 2020

Environmental Science (XII)

Three hours and a quarter

[Total marks: 100]

(The first 15 minutes of the examination are for reading the paper only.

Candidates must **NOT** start writing during this time)

Instruction: Answer all the questions in this paper itself. For the first fifteen minutes you will read the questions.

SECTION – A: [40 Marks]

COMPULSORY: ATTEMPT ALL THE QUESTIONS

QUESTION 1

DIRECTION: Each question in this section is followed by four possible choices of answers: A, B, C and D. Choose the **MOST CORRECT** answer and circle it. Do not circle more than **ONE** alternative, if there are more than one choice circled, No score will be awarded. [1x 15= 15mark]

1. On testing the air quality of an area, it was found that the AQI value for the day was 197. This value indicate that the air quality is

A. good. C. very unhealthy.

B. unhealthy. D. hazardous.

2. The strategy which DO NOT conform to non-structural mitigation is

A. building of flood embankments. C. safe electrical wiring.

B. mounting furniture. D. locating objects to a safer place.

3. Which of the following are the reasons behind adoption of SDGs?

I Creating equal distribution of wealth around the world.

II To end poverty and hunger in all forms.

- III Extracting resources to boost economic development.
- IV Protect the Earth through sustainable consumption and production.

- A. I, II, & IV
- B. I, II & III
- C. I, III & IV
- D. II, III & IV

4. All of the following is the part of sustainable development goals EXCEPT

- A. Access to sustainable energy for all.
- B. Availability of water and sanitation for all.
- C. Provision of internet services for all.
- D. Promotion of decent job for all.

5. Which of the following is a common disadvantage of renewable energy sources?

- A. Highly polluting.
- B. High waste generation.
- C. High running cost.
- D. Unreliable.

6. The first step of the EMS process for an organization is to

- A. set environmental objectives and targets.
- B. establish environmental policy.
- C. assign environmental responsibilities.
- D. review environmental impacts.

7. Organic matter is an important part of the soil because it

- A. is a component of the soil.
- B. provides required nutrition for plant growth.
- C. helps in preventing soil erosion.
- D. drains out excess water.

8. National Biodiversity Strategies and Action Plan (NBSAP) is an outcome of

- A. Bonn Convention.
- B. Ramsar Convention.
- C. World Heritage Convention.
- D. Convention on Biological Diversity.

9. The diversity of organisms present on Earth is the result of

- A. ecosystem stability.
- B. natural selection.
- C. homeostasis.
- D. direct harvesting.

10. The primary document that guides the development of effective disaster management plan in Bhutan is

- A. Disaster Management Act of Bhutan.
- B. Disaster management Rules and Regulations.
- C. Disaster management strategic Policy framework.
- D. National Disaster Risk Management Framework.

11. The difference between mitigation and adaptation is

- A. mitigation adjusts whereas adaptation controls the impacts of climate change.
- B. mitigation controls whereas adaptation adjusts to the impacts of climate change.
- C. mitigation is the planning process whereas adaptation is the implementation process for climate change.
- D. mitigation is the implementing process whereas adaptation is the planning process for climate change.

12. An agricultural land which is situated on steep terrain, the major cause of land degradation is

- A. flood.
- B. landslide.
- C. soil erosion.
- D. wind erosion.

13. Pema used a method of irrigation in which water is pumped and distributed through a system of pipes. This method is known as

- A. Drip irrigation.
- B. Sprinkler irrigation.
- C. Surface irrigation.
- D. Pitcher irrigation.

14. Which of the following statement is NOT TRUE for hydrogen fuel?

- A. It is commonly used in cars.
- B. It is stored as gas at high pressure.
- C. It is inflammable and explosive in nature.
- D. It is stored as liquid at cryogenic temperature

15. Benthic macroinvertebrates are used as indicator for water quality test because

- A. they are easy to capture for study.
- B. they are very sensitive to pollution of water
- C. their population increases with contamination of water.
- D. they are only organisms found in the bottom of water.

QUESTION 2

DIRECTION: Fill in the blanks with most correct and suitable words. Do not have to copy the sentences. [0.5 x 10 =5 marks]

1. After a forest fire in a place, the ecosystem rejuvenates to its original state. This ability of the ecosystem to recover from change is called
2. There were 15 species of invertebrates in a pond. The removal of one species from the pond led to decrease in the species composition. The species removed was likely to bespecies.
3. Punatshangchhu project provides financial support for plantation programme in a barren area to increase carbon dioxide absorption. This is an example of.....
4. The environmental clearance certificate for any project in our country can be accessed from
5. Pema usually rides bicycle to go to the office in order to contribute to the green economy. This is an example of
6. One way to address human-wildlife conflict is by moving the local communities to areas with better resources and opportunities through
7. Fishes will die in the pond if the dissolved oxygen concentration is less than mg/L.
8. The impact of change poses a challenge to the biodiversity management because it alters the adaptation and behavior of living organisms.
9. People visiting ParoTaktshang is an example of ecosystem service.
10. When ecological footprint exceeds the then developmental activities are considered unsustainable.

QUESTION 3

DIRECTION: Match the items of column I with the most appropriate items of column II. Rewrite the correct matching pairs. [0.5 x 10 =5 marks]

Column I	Column II
1.Global Goals	a. Millennium Development Goals
2. Dimensions of development	b. Responsible consumption and production
3. Hypothesis	c.criteria for setting the SDG targets
4. Hyogo framework for Action	d. Sustainable Development Goals
5. GNH	e. Social, Economic and Environment
6. Endemism	f. Developmental philosophy
7. Incentive program	g. Restoration of land
8. SDG- 12	h. Conservation practice creating tolerance to wildlife
9. Mine reclamation	i. species specific to a defined geographical location
10.SMART	j. testable statement supported or rejected by evidences
	k. building resilience of nations and community to disaster

Column I	Column II

QUESTION 4

DIRECTION: Write TRUE or FALSE for the following statements. Rewrite the false statements in the correct forms. [1x5 = 5 marks]

- a. The diversity of organism in adjacent communities is larger than in the ecotone.
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- b. During the formation of climax community, the energy requirement is minimum
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- c. Royal Thimphu College in Bhutan is an example of Quaternary industry.
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- d. About 27% of the total fresh water resources are in the form of groundwater.
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- e. The AQI value for a particular day is equal to the highest AQI value for the particular pollutant for that day.
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QUESTION 5

DIRECTION: Answer the following questions briefly. [10 marks]

- 1. Define Life Cycle Assessment. [1 mark]
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- 2. Do you agree that the modern technology is the best solution for energy conservation? Justify with any two relevant points. [2 marks]
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3. How can knowledge of soil properties be useful to the farmers? [2 marks]

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4. Explain with an example on how incentive programmes help in biodiversity conservation. [2 marks]

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5. Suggest any two measures that would help the government to achieve carbon neutral policy of the country. [2 marks]

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6. Why does hazard characterization depend on the nature of toxic substance? [1 mark]

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SECTION-B: [60 marks]

ANSWER ANY SIX QUESTIONS OF SEVEN QUESTIONS

DIRECTION: There are seven sets of questions. You need to answer any SIX sets of questions. Each sets of question carries 10 marks. Remember to write according to the marks given in the brackets.

QUESTION 1

1. Write any two differences between horizontal stratification and vertical stratification [2 marks]

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2. Relate the significance of pioneer species in the establishment of pioneer community. [2 marks]

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3. Define carbon footprint. [1 mark]

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4. Explain any three impacts of ground water depletion to the environment. [3 marks]

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5. What is genetic pollution? Suggest one measure through which genetic pollution can be prevented. [2 marks]

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QUESTION 2

1. A farmer in Samtse uses 220m³ of firewood. The national average yield for the production of firewood is 4.10 m³/ha. If the yield factor for firewood production is 2.31 and equivalence factor is 2.00, what will be the ecological footprint in global hectares? Interpret your findings. [3 marks]

2. Draw a relationship between socio-cultural beliefs of Bhutanese community and biodiversity management. [2 marks]

3. Briefly explain the three components of vulnerability assessment in climate change adaptation. [3 marks]

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4. Mention any two applications of ICT in the prevention of disaster. [2marks]

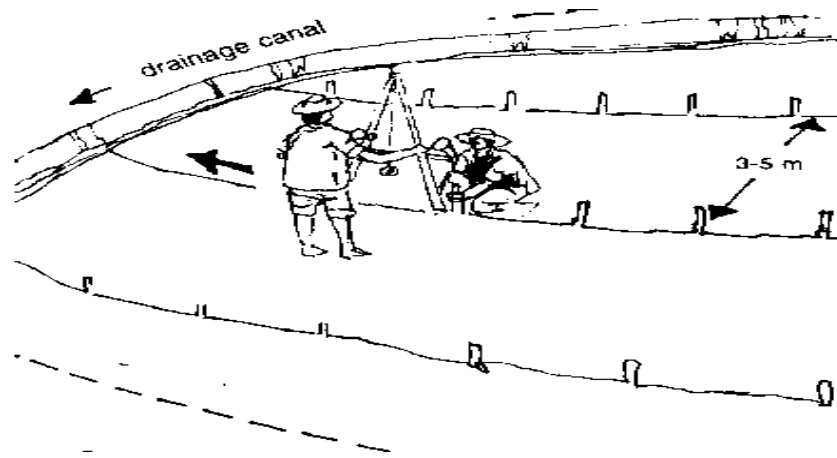
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QUESTION 3

1. Does poverty contribute to biodiversity loss? Support your answer with any two relevant points. [2 marks]

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2. Study the diagram given below and answer the following questions:



a. What is the type of farming activity shown by the diagram? [1 mark]

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b. Identify and name the tool preferred for the activity. [1 mark]

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c. State any two significance of the practice in conserving water in the field. [2 marks]

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3. What can be some of the challenges that the users may face in transition process of changing energy sources from fossil fuel to alternative energy sources? [2 marks]

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4. Define environmental audit. Why is it carried out? [2 marks]

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QUESTION 4

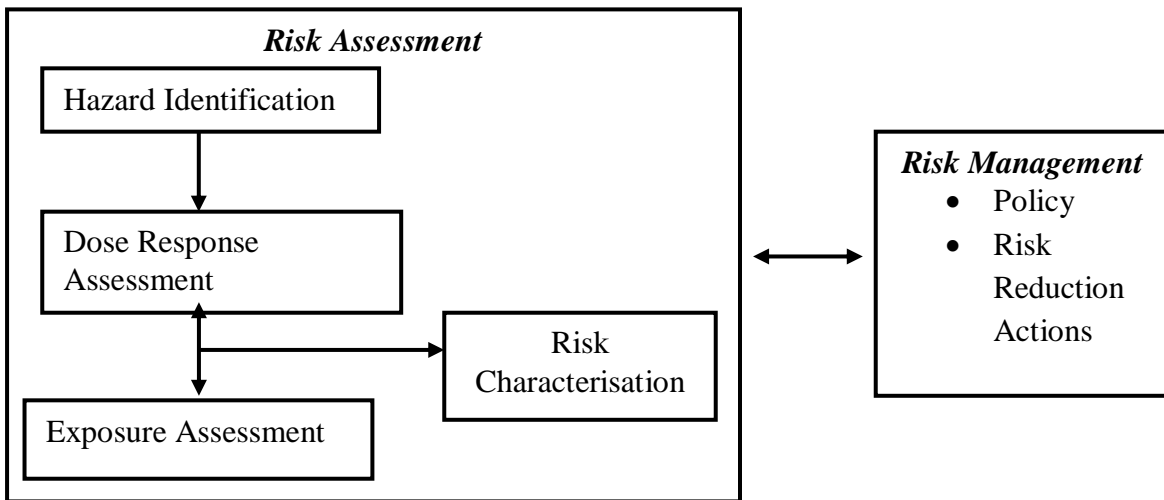
1. State any three challenges for Bhutan in achieving the SDGs. [3 marks]

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2. How does rich biodiversity influence the provisioning services of ecosystem? [3 marks]

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3. Study the given figure and answer the questions that follow:



a) What is risk characterization? [1 mark]

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b) Risk management is guided by the outcome of risk assessment. Justify the statement. [2 marks]

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4. How does adopting an Environmental management system help an organization?[1 mark]

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Question 5

1. In Samtse, there are many incidences where the crops of people are damaged by the elephants. Moreover, the animals are a threat to the people living in the area also.

a. What is portrayed in the statement above? [1 mark]

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b. Why do you think such incidences are occurring? [1 mark]

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c. How can the people reduce the occurrence of such incidences in future? [1 mark]

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2. “Urbanization is a blessing for the people.” Debate For or Against the point. [2 marks]

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3. What do you understand by Green building? List FOUR characteristics of a green building. [3 marks]

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4. Explain secondary succession with an example. [2 marks]

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Question 6

1. Community periodicities are associated with the daily rhythms of diurnal or nocturnal, seasonal or tidal or lunar variations.

a) What is periodicity? [1 mark]

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b) Give an example of periodicity. [1 mark]

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2. Dawa has observed the phenophase of apple tree for five months. He recorded the observations, compiled it and submitted the data to Central Data Repository every week.

a) What are the advantages of such kind of initiative? [2 marks]

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b) If he did it voluntarily, what is it known as? [1marks]

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3. Solar energy is used by the people as an alternative energy source. Explain the conversion of solar energy into electricity by photo-voltaic cell.[3 marks]

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4. Which one would you want to use in your house, incandescent bulb or fluorescent bulb? Justify your choice with TWO points. [2 marks]

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Question 7

1. State any **TWO** objectives of Convention on Biological Diversity. [2 marks]

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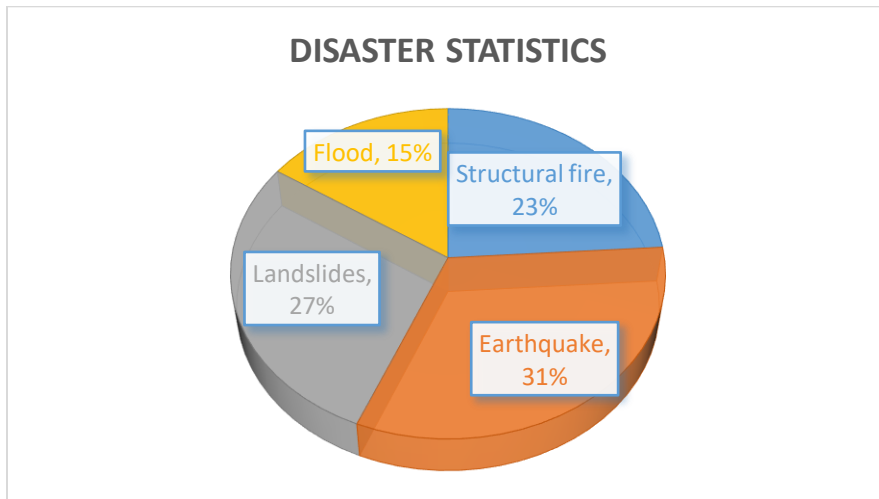
2. On a hazy day in Gomtu, the level of carbon monoxide was recorded as 12 ppm. The standard amount of carbon monoxide is 9 ppm.

a. Calculate the AQI of Gomtu. [2 marks]

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b. What would be the implications of this air quality on the local community? [1marks]

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3. The pie chart given below represents the summary of disaster statistics for Bhutan from the year 2000-2015. Study the chart and answer the following questions:



- a. It is evident from the chart that Bhutan has experienced the highest frequency of earthquake. What makes Bhutan vulnerable to earthquake? [1 mark]

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- b. The frequency of occurrence of landslide is next to earthquake. Mention any two causes of that has led to the increased frequency of landslide in Bhutan. [2 marks]

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- c. The frequency of occurrence of structural fire shows 23%. State two mitigation measures implemented by the Department of Disaster Management. [2 marks]

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