

SECTION A

(50 Marks)

Answer ALL questions.

Question 1

**I Each question in this part is followed by four possible choices of answers.
Choose the correct answer and write it in the space provided.**

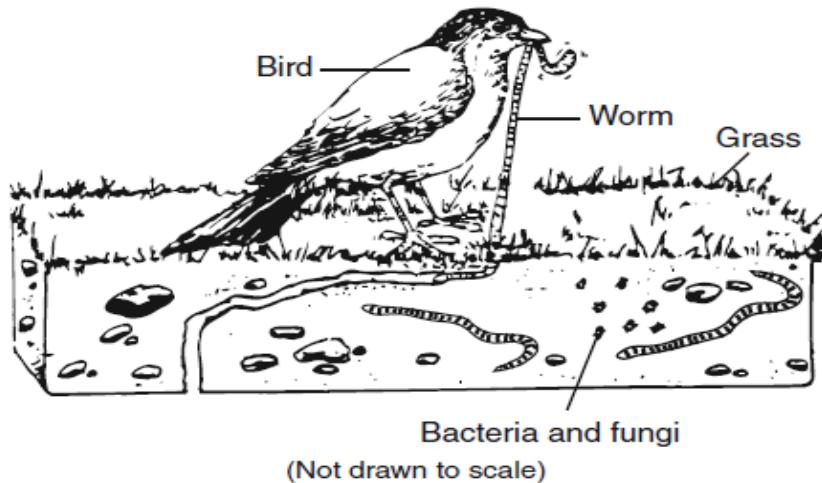
[25 marks]

1. Carbon cycle is essential biochemical cycle that maintains nutrients in the soil.
Name the biotic component in the carbon cycle.

- A Air
- B Tree
- C Water
- D Factory

Answer:

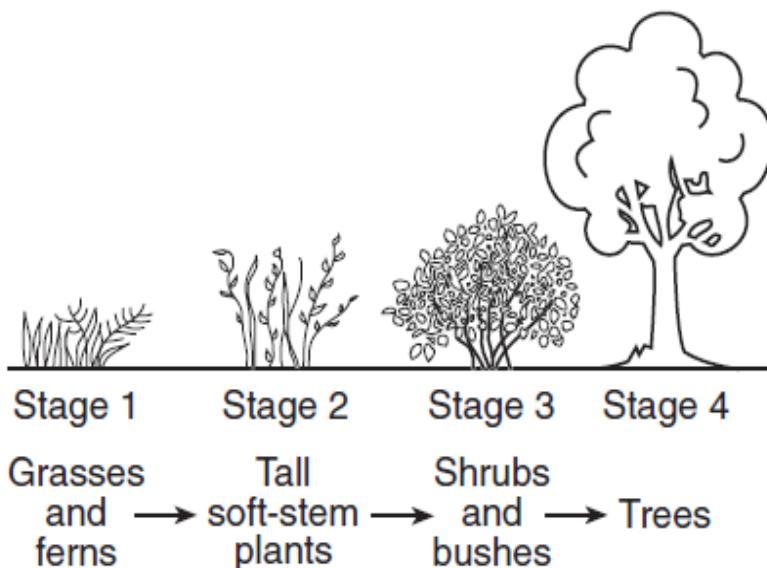
2. The diagram below shows different organisms living in an area. It depicts



- A species diversity and aquatic diversity.
- B genetic diversity and species diversity.
- C ecosystem diversity and genetic diversity.
- D species diversity and ecosystem diversity.

Answer:

3. After a forest fire, an ecosystem undergoes a change over a long period of time as shown in the diagram below. Such ability of an ecosystem to regenerate after disturbance is



- A phenology.
- B evolution.
- C resilience.
- D resistance.

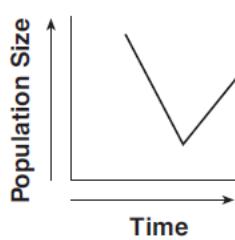
Answer:

4. The increase in the level of carbon dioxide in the atmosphere affects the earth's climate. Which one of the following international organization establishes a framework for implementation of actions in reducing Greenhouse gases emission?

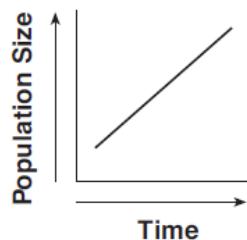
- A Kyoto Protocol
- B World wildlife Fund
- C United Nation Development Programme
- D United Nation Educational, Scientific, and Cultural Organization

Answer:

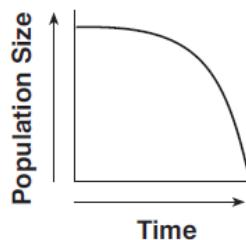
5. Which graph represents a steady growth of population with maintained carrying capacity level of its ecosystem?



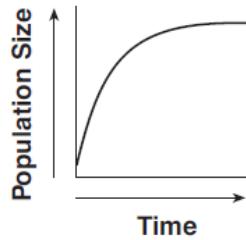
I



II



III



IV

- A Graph **I**
- B Graph **II**
- C Graph **III**
- D Graph **IV**

Answer:

6. The major changes in lifestyle in recent years is influenced by

- A culture.
- B politics.
- C technology.
- D environment.

Answer:

7. Teak tree has been tagged endangered due to

- A overharvesting.
- B unregulated policy.
- C unfavourable climatic condition.
- D inappropriate method used to harvest.

Answer:

8. The Constitution of the Kingdom of Bhutan states to maintain 60 % forest cover for all times to come. However, at present, we have more than 60 % forest cover. This will keep our country

- A rich in oxygen.
- B carbon negative.
- C green for all time.
- D known to outside world.

Answer:

9. In most developing countries, natural resources degradation are directly brought about by

- I life Style.
 - II population.
 - III urbanization.
 - IV modernisation.
- A I only
 - B I and II
 - C I, II and III
 - D I, III and IV

Answer:

10. Disaster caused by Ebola virus and rice blast are classified as

- A biological disaster.
- B geo-physical disaster.
- C hydrological disaster.
- D climatological disaster.

Answer:

11. Which one of the following is the most common type of disaster in our country that has major impact on the environment?

- A Drought
- B Forest fire
- C Avalanches
- D Earth quake

Answer:

12. The following are the impacts of climate change EXCEPT

- A earth quake.
- B frequent flood.
- C rise in sea level.
- D disease outbreak.

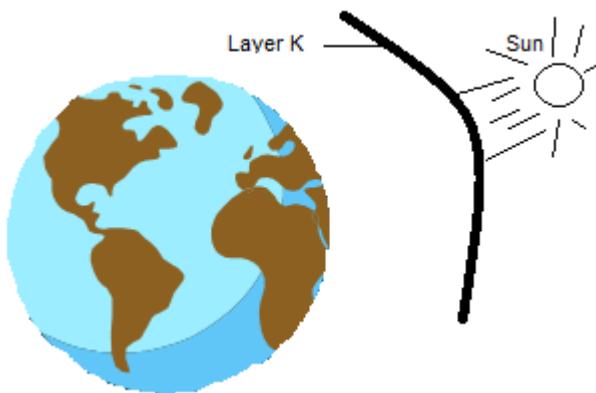
Answer:

13. The green house gas that maintains Earth's temperature and also used by plants for preparation of food is

- A methane.
- B water vapour.
- C carbon dioxide.
- D nitrogen dioxide.

Answer:

14. Diagram below shows the presence of a layer (K) in the stratospheric layer of the atmosphere. How does this layer help us?



- A It absorbs carbon dioxide.
- B It absorbs ultraviolet rays.
- C It increases the Earth's temperature.
- D It produces reactive chlorine radical.

Answer:

15. Study the hypothetical data in the table below and answer which country is most likely to contribute more towards global warming?

| COUNTRY | MAJOR SOURCE OF NATIONAL INCOME |
|---------|---------------------------------|
| P | Hydropower |
| Q | Tourism |
| R | Agriculture |
| S | Industry |

- A Country P
- B Country Q
- C Country R
- D Country S

Answer:

16. Conservation of bio-diversity is initiated under in-situ and ex-situ conservation programs. An example of ex-situ conservation of flora and fauna in our country is best seen in
- A Royal Botanical Garden.
 - B Toorsa Strict Nature Reserve.
 - C Bomdeling Wildlife Sanctuary.
 - D Jigme Dorji Wangchuck National Park.

Answer:

17. Ap Tashi, a livestock farmer uses an open field with grasses and shrubs for grazing. This type of land use is known as
- A Chuzhing.
 - B Kamzhing.
 - C Sokshing.
 - D Tsamdro.

Answer:

18. One of the objectives of distributing power tiller and other farming machineries to farmers is mainly to
- A enhance farmers' lifestyle.
 - B encourage modern farming.
 - C reduce work loads of farmers.
 - D transport goods from home to fields.

Answer:

19. Which one of the following activity uses non- renewable energy resources?
- A Plants preparing food
 - B Mother preparing food
 - C Winnowing of grains by air
 - D Water rotating the turbine for electricity

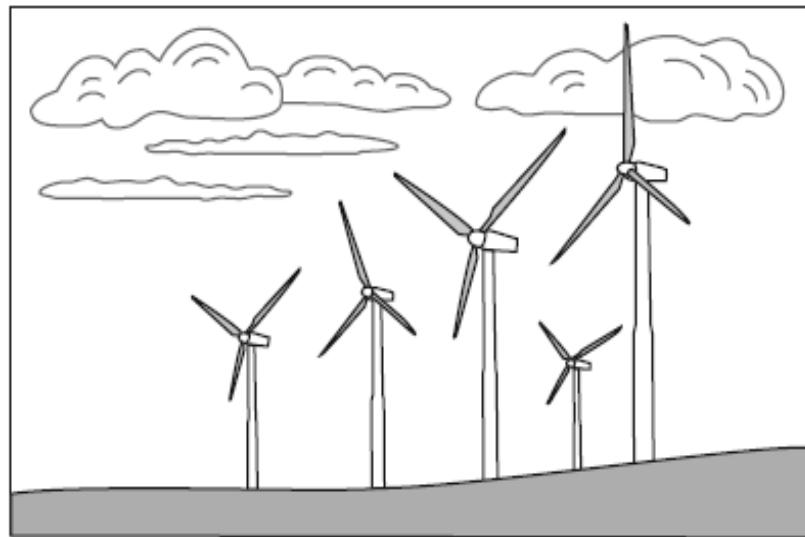
Answer:

20. Which one of the following is **NOT** the purpose of energy conservation?

- A To reduce annual rainfall
- B To reduce the depletion of ozone layer
- C To reduce energy consumption per capita
- D To reduce emissions of green house gasses

Answer:

21. Wangduephodrang is well-known for high wind velocity. The dzongkhag authority therefore, decided to install wind mills to generate power for the development of town as shown in figure below. Which statement is correct about this installation?



- A It is inexpensive.
- B It is renewable resources.
- C It is non-renewable resources.
- D It is better than hydro power for a mountainous country.

Answer:

22. Hydro power energy in our country is

- A safe, reliable and affordable.
- B reliable, affordable and not safe.
- C safe, affordable and not reliable.
- D safe, reliable and very expensive.

Answer:

23. What is the main function of Environment Impact Assessment (EIA)?

- A To study the marketing facilities of the project.
- B To study the employment opportunity of the project.
- C To study the potential environmental effects of the project.
- D To study the potential economic advantages of the project.

Answer:

24. Reconstruction and renovation of our dzongs is an aim of

- A Basel Convention.
- B Vienna Convention.
- C International Trade Convention.
- D UNESCO World Heritage.

Answer:

25. Which one of the following activity is **NOT** under sustainable development goals?

- A Protecting ecosystem
- B Constructing safe buildings
- C Procuring low efficient machineries
- D Use of public transport to reduce the use of private vehicles

Answer:

II Fill in the blanks with appropriate words.

[5 marks]

- (i) Monkeys, wild boars and black bears competing for maize as their common food is.....competition.
 - (ii) ecosystem is characterized by having natural balance of organisms, physical environment and biochemical cycles.
 - (iii) When the pressure on natural resources....., the availability of resources becomes limited.
 - (iv) Information about patterns and life cycle events of organisms in natural environment is termed as
 - (v) An initiative taken by our government to conserve biodiversity and boost the economy of the local communities through tourism is

III Match each item of column A correctly against the item in column B.

Rewrite the number of matching pair in the space provided.

[5 marks]

| Column A | Column B |
|---|--|
| A Conducts studies on invasive species | (i) Ecological foot print |
| B Bio-productive area and resource requirements by humans | (ii) Community forest |
| C Resource consumption patterns of people overtime, which impacts environment | (iii) Convention on Biological Diversity |
| D Conservation and sustainable use of the components of biodiversity | (iv) Phenology |
| E Biodiversity managed by locals | (v) National Biodiversity Center |
| | (vi) Lifestyle |

IV State TRUE or FALSE for the statements given below:

[5 Marks]

- (i) When our lifestyle gets better, consumption of resources would decrease.
 - (ii) Biodiversity conservation provides a wide range of ecological services.
 - (iii) Involuntary displacement of people from their residential land due to hydropower construction is an environmental impact of hydropower.
 - (iv) Reducing the use of fossil fuels is an example of energy conservation.
 - (v) Green Procurement Practices of our country procures environmentally preferable goods and services.
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V Answer the following questions.

[10 Marks]

- (i) Explain carrying capacity of a biological species in an environment. [2]

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- (ii) Bhutan has many endangered animals that are protected in large parks and sanctuaries. Should the government continue to protect these animals? Justify with **THREE** reasons. [3]

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- (iii) Today, we consume lots of packed items and generate lots of wastes. We should not throw these wastes everywhere but put them in the dustbins, which should then be taken to landfills. “Landfills are best solution to all kinds of waste.” What is your opinion on this statement? Support your answer with **THREE** reasons. [3]

- (iv) Suppose you are an expert on disaster risk management. Study the flowchart and complete the operational procedure of disaster in a systematic way. [2]

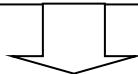
Emergency Plan

Disaster can occur suddenly and without warning. I will inform all the members how to get to safe places, whom to contact during the disaster. I will present and display the plan in all places.



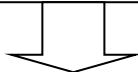
Disaster Preparedness

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Disaster Relief

It is the recovery phase to reduce the impact of disaster. I will inform humanitarian organization (army, police, doctors, etc) to rescue, provide food and water, shelter, check for outbreak of diseases, etc. until recovery.



Disaster Rehabilitation

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Section B (50 Marks)

Answer any FIVE questions

Question 2

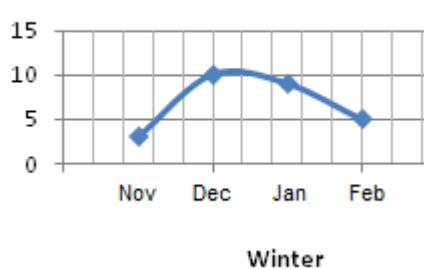
- a. Name **TWO** natural resources of Bhutan. [2]

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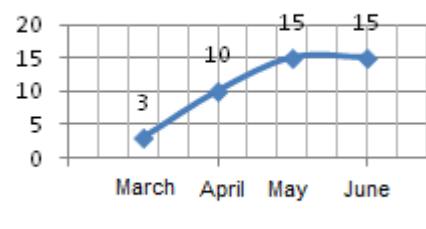
- b. Differentiate between ecto-parasites and endo-parasites with an example each. [3]

- c. A farmer calculated the carrying capacity of the farmland, which supported the cattle for two different seasons as shown below. Study the graphs and answer the questions i and ii.

Graph A



Graph B



i. What is the maximum carrying capacity of the farmland for winter?

[1]

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ii. Which graph represents stable carrying capacity? Justify with respect to productivity of the farmland.

[1]

d. One of the key challenges of sustainable development in our country is poverty. Based on poverty analysis, despite steady improvement in people's livelihood, high level of poverty still prevails in our country. If you were policy maker, what **THREE** policies would you make to address and solve this challenge?

[3]

Question 3

- a. National Disaster Risk Management act of Bhutan came into force on 18 March, 2013. Write any **TWO** functions of National Disaster Risk Management authority. [2]

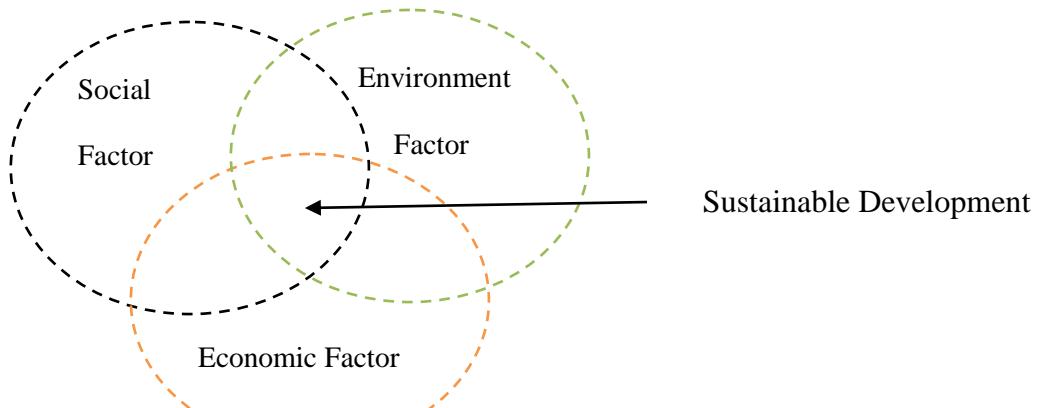
- b. Study the table below and answer the questions i and ii.

| Sl No | Species | Number(n) | N(n-1) |
|-------|---------|------------|--------|
| 1 | Maize | 4 | 12 |
| 2 | Rice | 2 | 2 |
| 3 | Wheat | 1 | 0 |
| 4 | Barley | 6 | 30 |

- i. Find the Simpson's index (D). [2]

- ii. What is your conclusion from the value of D about the species diversity? [1]

- c. The diagram below shows sustainable development based on three factors. Explain with a reason each to show how sustainable development is dependent on these three factors. [3]



- d. Do you think Bhutan is more vulnerable to flash floods or forest fires? Justify with **TWO** reasons. [2]

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Question 4

- a. Complete the following table with a corresponding point under the given headings: [2]

| Natural Resources | Cause of Degradation | Implication | Measure for Prevention |
|--------------------------|-----------------------------|-------------------------------|-------------------------------|
| Forest | | Decrease in country's economy | |

- b. Before government policies, laws and regulation to protect environment were enacted, people in the community conserved the biodiversity by appointing *risup*, *misup* and *shingsungpa*. There were also practices of *ridam* and *ladam* in our country. [5]

 - i. Write **ONE** importance of such local practices.
 - ii. Write a difference each to show how *ridam* is different from *ladam*.
 - iii. Name any **TWO** National Conservation initiatives in our country that protect and conserve biodiversity.

c. The diagram below shows a balanced and undisturbed ecosystem.

How would overharvesting this forest impact your daily living? Write any **THREE** points. [3]



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Question 5

- a. The 7.8 magnitude earthquake that hit Nepal in April, 2015 was a disaster. Give **TWO** reasons why it was a disaster. [2]

- b. Hydropower is our major energy resource. Write **THREE** advantages and disadvantages for hydropower generation in our country. [3]

- c. The soil on a farm can quickly become depleted of minerals because harvesting of crops can interfere with the biochemical cycles. How is biochemical cycles important in an ecosystem? Write **TWO** points.

[2]

- d. Our electricity generation is mostly dependent on our water resources. Can Bhutan also use solar energy as source of energy? Justify with **THREE** reasons.

[3]

Question 6

- a. What are the different types of land use pattern in Bhutan? List any **TWO** land use patterns in Bhutan. [1]

b. What do you mean by “**Bhutan is carbon negative?**” [2]

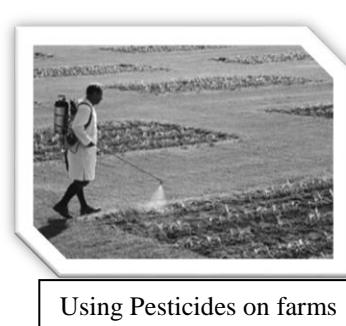
c. Classify the following wastes that are generated from our daily activities as biodegradable and non-biodegradable waste. [2]

Nail, leftover potato curry, cotton cloth, empty mineral water bottle

| BIODEGRADABLE WASTE | NON-BIODEGRADABLE WASTE |
|---------------------|-------------------------|
| | |

d. Study the diagram below and answer the following questions:

[5]



- i. Identify any **TWO** human activities that enhance green house effect.
- ii. Green house gases produced through human activities deplete ozone layer. Write any **TWO** effects of ozone depletion.
- iii. Write any **TWO** measures initiated by our government to prevent climate change.

Question 7

- a. **Four Rs** are ways to manage waste. Name the 4 Rs? [2]

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- b. Explain the meaning of species diversity. [2]

- c. *“Every Bhutanese is a trustee of kingdom’s natural resources and environment.....”* Briefly explain the given statement in your own words. [2]

- d. Bio-productive land is the area that contributes to the resources that we use for food, fuel and shelter. Explain **TWO** major bio-productive lands of Bhutan.

[2]

- e. The diagram below shows some of the factors that affect our consumption pattern in our social lives. Write **TWO** points to show how family and friends affect our consumption pattern?

[2]

