

TEACHERS' REFERENCE
FOR
COMPETENCY BASED ASSESSMENT
BOOKS

Class-VII
Geography



Bhutan Council for School Examinations and Assessment

2016

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Item Developers:

Mr. Ugyen Dorji, Principal, Yoeseltse MSS, Samtse
Mr. Sonam Palden, Teacher, Drukgyel HSS, Paro
Ms. Tshering Zangmo, Teacher, Motithang HSS, Thimphu
Ms. Namgay Lhaki, Teacher, Changangkha MSS, Thimphu
Mr. Ngawang Jamtsho, Principal, Namchala LSS, Dagana
Mr. Thinley, Principal, Metakha LSS, Chukha
Mr. Hari Parsad, Teacher, Phuntshothang MSS, Samdrup Jongkhar
Mr. Nima Dorji, Teacher, Trashigang MSS, Trashigang
Ms. Nima Dema, Teacher, Dechentsemo CS, Punakha
Ms. Tshering Om, Teacher, Khasasrapchu, Thimphu
Mr. Choki Dorji, Teacher, Minjey MSS, Lhuentse
Mr. Dorji Wangchuk, EMO, BCSEA

Professional Support:

Mr. Kinga Dakpa, Secretary, BCSEA
Mr. Sangay Tenzin, Chief, AMD, BCSEA

Copy Editor:

Mr. Sonam Palden, Teacher, Drukgyel HSS, Paro
Mr. Dorji Wangchuk, EMO, BCSEA

Overall Coordinator:

Mr. Dorji Wangchuk, EMO, BCSEA

Cover, Layout and Design:

Mr. Sonam Gyeltshen, IT Section, BCSEA

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BACKGROUND

As mandated under Performance Compact Charter 7 of *Accelerating Bhutan's Socio-economic Development (ABSD)*, one significant initiative undertaken by the Bhutan Board of Examinations (BBE) was to develop *Teachers' Guide on Competency Based Assessment (CBA)* for selected subjects for various class levels in 2010 (10th Plan).

Teachers' Reference for Competency Based Assessment (TRCBA) books were first developed for Classes V, VII and IX in three subjects (Dzongkha, English and Mathematics) and introduced to all the secondary schools in 2011. Meanwhile, the erstwhile BBE was renamed as the Bhutan Council for School Examinations and Assessment (BCSEA) after as an autonomous body and it was later delinked from the Ministry of Education (MoE) with effect from April 2011. In the following year, a survey was carried out on the usefulness of these books in teaching learning.

Subsequently, based on the feedbacks received from the teachers in the field, the Ministry of Education endorsed the recommendations to further develop the CBA books as teachers' reference guides for other subjects across the school curricula with an intent to improve both the standard and delivery of quality education in the country.

Broad objectives of CBA are to:

- 1. enhance and improve teaching learning assessment of student competencies in schools at various class levels,*
- 2. enables teachers to frame their own creative (modular) assessment tools using the booklet as reference guides, and*
- 3. provide sample questions/model answers in the guide books inclusive of infusion of the GNH values wherever applicable while framing the questions for different student levels.*

INTRODUCTION

It is essential that teachers have prior understanding of what competency based assessment (CBA) actually means. It is the process of collecting evidence and making judgments on whether students have demonstrated the required learning competency that will allow them to move to the next competency level in a study course.

Competency is the ability of a student to apply content knowledge and skills in and/or across the content area(s). It means that assignments are linked to the competencies that they are designed to assess and student performance is reported in a way that tracks students' mastery of the competencies that have been identified for each course.

CBA is focused on assessing the learning outcomes (competencies) that are linked to students' needs in real life situations involving portfolios, experiential learning in field experiences, demonstration in varying contexts, role play, etc. It defines educational goals precisely in measurable descriptions of knowledge, skills, and behaviors which students should possess at the end of a course of study.

- *Competencies consist of a set of essential skills, knowledge, attitudes, and behaviors required for effective performance of a real-world task or activity.*
- *Competencies within different contexts may require different sets of skills, knowledge and attitudes.*

However, teachers will need to gradually shift their focus from emphasizing on the content learning of the curriculum to assessing the development of student competencies in classroom teaching-learning situations.

Teachers constantly need to revisit and re-think about what they teach, how they teach, and evolve the ways in which they can help the students to demonstrate mastery over what they have learned and interact with the larger world around them.

The term *assessment* refers to the process of obtaining information about student learning outcomes to:

- *assess through formal/informal observations of students' performance, demonstration of skills and knowledge, portfolio-based assessments, tests, project works, oral questioning and analysis of student records, and*
- *guide educational policy decisions about students; to inform students, their parents, teachers, or other audiences about their progress, strength and achievements.*

The key to competency based assessment is based on actual skills and knowledge that a student can demonstrate in the workplace or other contexts. CBA in this case will lead to functional approach to reading and writing education emphasizing life skills and evaluating mastery of those skills in terms of achieving student proficiency in English learning.

PURPOSE OF THE BOOK

This booklet comprises model questions and their answers that can be used to assess competencies across all the learning strands. It is intended to serve as a guide for teachers to help them in the classroom teaching and also be an item bank from which they may draw questions to assess students' competencies in Reading and Writing as specified in the strands and learning objectives of the English curriculum.

However, it is cautioned that the questions and answers given in the booklet are in no way prescriptive; they are rather intended to serve as guides, suggestions, or prompts for the improved construction and designing of the questions and answers that assess students' learning competencies.

How to use this book

The questions and answers in this booklet may be used:

- 1. as a reference when developing teaching and assessment plans in history lessons with suggested classroom activities and the resources,*
- 2. while planning to assess the student competencies in classroom practice, collecting evidence of learning for assessment and to make immediate connections to assessment and reporting,*
- 3. to assess student competencies (achievements or failures) in the formative or summative learning in the form of class tests, term tests, etc.,*
- 4. as models/samples of reliable questions/answers testing competencies for the construction of questions that may be required for the assessment of skills through other texts, and*
- 5. to review the value of using assessment criteria and be able to use them to grade work and give constructive feedbacks.*

BHUTAN GEOGRAPHY

CHAPTER ONE: RELIEF AND CLIMATE

Learning outcomes

At the end of the lesson, a student should be able to:

1.1 Examine the relief features and altitudinal zones of Bhutan.

Question 1

[Remembering]

Bhutan is a mountainous country bounded by China in the north and India in the south. The height ranges from

- A 200m in the south to 2000m in the north.
- B 200m in the south to 4000m in the north.
- C 200m in the south to 6000m in the north.
- D 200m in the south to 7000m in the north.

Answer: D 200m in the south to 7000m in the north.

Question 2

[Understanding]

The map given below shows the three altitudinal zones of Bhutan. Identify the shaded portion of the map and describe the physical features of the area.

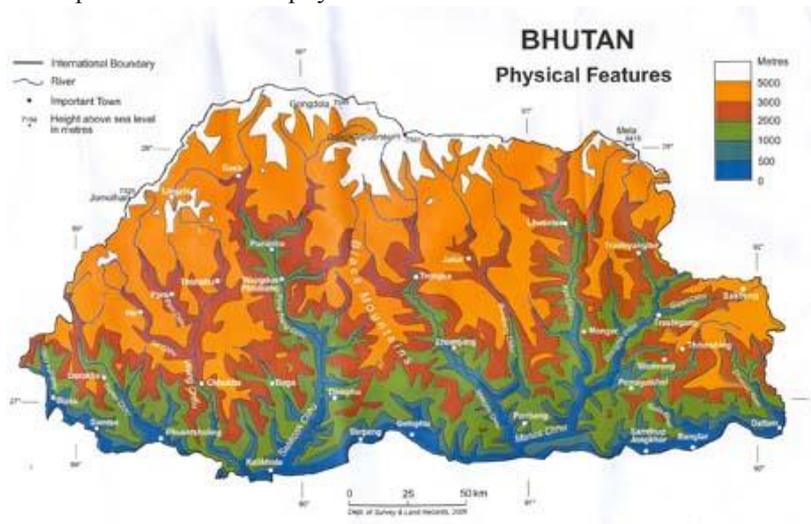


Figure 1

Answer: The shaded portion is Inner Himalayas and it is characterized by the following features:

- It has deep valleys with five major rivers, passes and valleys.
- The vegetation is composed of a mixture of broadleaved and coniferous forest.

Question 3**[Applying]**

The information given in table 1 describes the three altitudinal zones found in Bhutan. Study the information carefully and rearrange them in the table given below:

Table 1

Sl. no.	Features
1.	This zone is marked by deep valleys of five major river systems.
2.	The average width of the zone is about 50 km.
3.	The vegetation changes from trees to small bushes.
4.	The vegetation consists of a mixture of broadleaved and coniferous forest.
5.	The average width of the zone is about 30 km.
6.	The vegetation consists of dense subtropical forest.
Southern Foothills	
Inner Himalayas	
Greater Himalayas	

Answer:

Sub-Tropical Foothills	Inner Himalayas	Greater Himalayas
2. The average width of the zone is about 50 km. 6. The vegetation consists of dense subtropical forest.	1. This zone is marked by deep valleys of five major river systems. 4. The vegetation consists of a mixture of broadleaved and coniferous forest.	3. The vegetation changes from trees to small bushes. 5. The average width of the zone is about 30 km.

Question 4**[Analyzing]**

People living in Laya and Lunana prefer raising animals to cultivating crops for their livelihood. Explain why cultivation is least preferred in these areas?

Answer: People in Laya and Lunana prefer raising animals to cultivating crops since the altitude is very high. The cold climatic conditions and infertility of the soil make it unfavorable for cultivation of crops.

Question 5**[Evaluating]**

Ap Bokto lives in Merak and he depends on livestock for living. He now has to resettle in Samtse and live for the rest of his life there. If you were Ap Bokto, would you love to live in Samtse? Support your answer with **TWO** reasons.

Answer: **Yes.** 1. The land is fertile in southern foothills.
 2. The climatic condition is favourable.

No. 1. The climatic condition is completely different from Merak and it will be difficult to acclimatize.
 2. There will be a shift in daily activities due to marked difference in climate.

Question 6

[Creating]

The conditions are less feasible in the Greater Himalayas for agricultural activities due to its altitude. Suggest **TWO** strategies to boost the agricultural activities in the zone.

- Answer:
1. Introduce greenhouse cultivation.
 2. Supply high breed seeds to the farmers.
 3. Mechanize farm activities.

1.2 Identify the four climatic zones of Bhutan and describe the climatic conditions prevailing in each of the zones.

Question 1

[Remembering]

The general climatic conditions in Bhutan are categorized into four zones. Some of these zones receive the least rainfall and some receive the heaviest. Which of the following zone receives the heaviest rainfall?

- A The Alpine zone
- B The Sub Alpine zone
- C The Temperate zone
- D The Sub Tropical zone

Answer: D The Sub-tropical zone.

Question 2

[Understanding]

Alpine zone is one of the climatic zones of our country. All of the following features describe the zone **EXCEPT**:

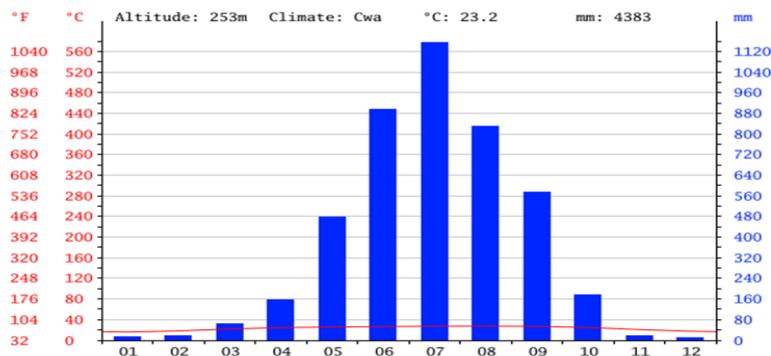
- A The growing season is very short.
- B The winter here is marked by snowfall and frost.
- C It remains cold even in summer.
- D The total annual rainfall varies from 1000mm to 1500mm.

Answer: D The total annual rainfall varies from 1000mm to 1500mm.

Question 3

[Applying]

The graph below shows the annual rainfall and temperature of Phuentsholing.



Phuentsholing lies in the Sub Tropical zone and receives annual rainfall of 4383mm. Landslides and floods are common during the monsoon season.

Study the graph given above and suggest the time during which travellers should avoid travelling to Phuentsholing.

Answer: July. It is the time in which there is maximum rainfall.

Question 4

[Analyzing]

Climate influences the lives of people in various ways. Compare the trends in lifestyle of the people living in the temperate zone with that of the subtropical zone.

Answer: As the climate in subtropical zone is characterized by hot and wet summer and warm winter people wear thinner clothes. On the other hand, people living in temperate zone wear thicker clothes since its climate is characterized by mild summer and cold winter.

Question 5

[Evaluating]

The temperate zone lies between a height of 2000m and 3000m. Most of the human settlements in Bhutan are found in this zone? Do you agree? Support your answer with **TWO** reasons.

Answer: **Yes.** 1. The climate is favourable.
2. The land is fertile.

No. 1. Subtropical zone offers better conditions for living. The lands are more fertile and consist of plains making it possible for mechanized and large scale farming.

Question 6

[Creating]

You are the Prime Minister of Bhutan attending a conference on Climate Change. Imagine some realistic strategies that you would propose at the summit to be adopted by the world to combat global warming.

Answer: 1. Identify effective strategies for low carbon emission.
2. Introduce effective management of emission from the industries.

1.3 Discuss the factors affecting the climate of Bhutan.

Question 1

[Remembering]

Climate in Bhutan is influenced by many factors. Some of the factors are:

- I The changing direction of the monsoon winds.
 - II The angle of sun's rays.
 - III Distance from the sea.
 - IV Latitudes.
- A I, II and III
 - B II, III and IV
 - C I, III and IV
 - D I, II and IV.

Answer: B II, III and IV

Question 2**[Understanding]**

From June to August, the monsoon winds blow from the Indian Ocean and Bay of Bengal towards interior of Asia. Write **TWO** advantage of this wind in Bhutan.

Answer: 1. It brings rainfall making it possible for farming.
2. It moderates the summer temperature.

Question 3**[Applying]**

Mr. Pemala comes is confused about where he should build his new house – on the slope facing or on the one facing north. Suggest where he should build his house. Why?

Answer: He should build his house on the south facing slope. The south facing slope receives direct sun rays and is warmer.

Question 4**[Analyzing]**

Match the items in column A against the correct items in column B. Rewrite the matching pairs.

Column A	Column B
1. The height of the land in conjunction with information about slope and shape	A. Latitude
2. The height of the land from the sea level.	B. Weather
3. Average weather condition	C. Altitude
4. Day to day condition of atmosphere	D. Relief
	E. Climate

Answer: 1(D), 2(C), 3(E), 4(B)

Question 5**[Evaluating]**

The existence of great mountain ranges in the north affects the climate of Bhutan. Do you agree? Support your answer with **TWO** reasons.

Answer: **Yes.**
1. The mountain range acts as a barrier for the seasonal winds which are also known as monsoons that blow during summer. This enables our country to receive rainfall which is extremely useful for our agriculture.
2. It also blocks the cold and dry wind which blows from the north during winter.
No. Other factors like temperature, latitude and distance from the sea also equally determine the climate of our country.

Question 6**[Creating]**

Imagine that the winds blowing from the Bay of Bengal and the Indian Ocean are deflected towards south of India. In the absence of the monsoon winds, it would be impossible for the people of our country to carryout effective agricultural activities. What new measures can you suggest to make agricultural practices effective?

Answer: 1. Develop effective irrigation system.
2. Cultivate crops which require less water.
3. Promote livestock farming.

CHAPTER TWO- THE SEASONS IN BHUTAN

Learning outcomes

At the end of the lesson, a student should be able to:

2.1 Identify the different seasons of the year.

Question 1

[Remembering]

Match each item in column A against the correct item in column B. Rewrite the matching pairs.

Column A	Column B
1. Winter	a. Mid – September-November
2. Spring	b. June - Mid September
3. Summer	c. March - May
4. Autumn	d. December – February
	e. May - mid July

Answer. 1.(d) 2.(c) 3.(b) 4.(a)

Question 2

[Understanding]

Which of the following is NOT a feature of the summer season?

- A The southern foothills become warm and pleasant.
- B The rain water gives rise to numerous brooks and streams.
- C The wind blow from south to north.
- D Farmers plant paddy during this season.

Answer. A - The southern foothills become warm and pleasant.

Question 3

[Applying]

The ground temperature begins to rise, plants start growing and birds migrate to their higher altitude habitat. Which of the following season does the above statement BEST describe?

- A Winter.
- B Spring.
- C Summer.
- D Autumn

Answer. B Spring

Question 4

[Analyzing]

Even in a small country like Bhutan, we enjoy four distinct seasons while in some parts of the world, people experience only two to three seasons. What causes this difference?

- Answer - Inclination of the earth's axis
 - The shape of the earth.

Question 5

[Evaluating]

If we had only two seasons in a year like in some parts of the world, would you like it? Justify with **TWO** points.

Answer **Yes**, because in places within the tropics, farmers can grow crops throughout the year.
No, because the same weather conditions will prevail for a longer period of time making the conditions unfavourable for the growth of some crops.

Question 6 **[Creating]**

People living in higher altitude migrate to the warmer valleys to escape the harsh winter conditions. Propose **TWO** alternatives to stop seasonal migration.

Answer -Provide solar heaters.
 -Proper storage facilities.
 - Build well insulated houses.
 -Introduce greenhouse cultivation.

2.2 Describe the climatic conditions in the four altitudinal zones in different seasons of the year.

Question 1 **[Remembering]**

The wet and rainy season which prevails from June-September is called _____.

Answer Monsoon.

Question 2 **[Understanding]**

Match the items in column A against correct items in column B.

Column A	Column B
1. The area where yaks are reared	a. Sub - tropical zone
2. There is no summer season here	b. Temperate zone
3. Many Dzongkhags are located here	c. Sub - alpine zone
4. Jungles are thick and infested with mosquitoes	d. the alpine zone
	e. Equatorial zone

Answer 1.(c) 2.(d) 3.(b) 4.(a)

Question 3 **[Applying]**

Paro Dzongkhag is noted for its thriving agriculture. What conditions favour farming activities in this dzongkhag?

Answer Broad river valley, fertile soil, adequate rainfall and warm climatic conditions.

Question 4 **[Analyzing]**

In summer, warm winds blow from south to north from the adjoining plains towards the Greater Himalayas. What causes the situation?

Answer -Difference in temperature and pressure between the mountains and the adjoining plains.
 -The deep river valleys running north-south act as tunnels through which these winds blow.

Question 5**[Evaluating]**

The climatic condition in the southern foothills is better suited for human settlement than the inner Himalayas. Do you agree? Support your views.

Answer **Yes**, Southern foothills experience warm and pleasant weather conditions. It has vast plain areas with fertile soil.

No, Southern foothills experience heavy rainfall during monsoon and is prone to landslides and floods. Most of the areas are infested with mosquito.

Question 6**[Creating]**

If the Himalayas did not exist, what type of climatic conditions would have prevailed in Bhutan?

Answer -Less amount of rainfall since the rain received in Bhutan is mainly because of the presence of mountains.

-Winters will be extremely cold because in the absence of the Himalayas there will be nothing to block the bitterly cold winter winds blowing from the interior of Asia.

2.3 Explain the factors affecting seasons.**Question 1****[Remembering]**

The sun's rays fall vertically over the two tropics once a year. On which date do the sun's rays fall vertically over the tropic of cancer?

Answer 21st June.

Question 2**[Understanding]**

During summer, the position of the sun shifts to the northern hemisphere creating a low pressure centre. Write down two advantages of this condition.

Answer - South-west winds blows from the oceans bringing rain.

- It will have a moderating effect on the climatic conditions in Bhutan.

- Longer days and shorter nights.

Question 3**[Applying]**

Every year the retreating monsoon wind damage crops in many parts of the country causing huge losses to our farmers. What ways can you suggest so that the farmers can prevent their crops from being damaged?

Answer - Farmers should harvest the crops before the onset of retreating monsoon winds.

-Farmers should build proper storage houses.

Question 4**[Analyzing]**

The monsoon wind starts to retreat during late autumn season. What are the advantages and disadvantages connected with the retreating monsoon wind?

Answer **Advantages** – The winter monsoon makes the weather conditions in the foothills warm and pleasant.

-Thunderstorms are common during this time of the year. Since thunderstorms are usually accompanied by rain, the fields get good amount of moisture for the winter crops.

Disadvantages – The cold wind blowing from interior of Asia makes the weather conditions very cold during winter in the inner Himalayas and beyond.

-The wind picks up moisture instead of bringing rain making the winter conditions dry.

Question 5

[Evaluating]

Which factor, the angle of the sun’s rays or the changing direction of the monsoon wind, play a better role in changing the seasons in Bhutan? Justify

Answer: Angle of the sun’s rays, because during summer the days become longer and temperature on land becomes higher than the surrounding water bodies. This enables the moisture-laden winds to blow from sea to land which brings good amount of rain.

The changing direction of the monsoon wind, because in summer the monsoon helps in lowering the temperature on land by bringing rain. Whereas the retreating monsoon wind blowing from the cold regions in the interior of Asia makes the winter conditions very cold.

Question 6

[Creating]

Days in winter are shorter than summer. Design a time table for your school to suit the short winter days.

Answer 9 am – Report to school
11 am – Interval
1 pm – Lunch
3 pm – School closes

2.4 Discuss the effects of seasons on farming.

Question 1

[Remembering]

For agriculture, the _____ facing slope is always better.

Answer South.

Question 2

[Understanding]

Match the items in column A with items in column B:

Column A	ColumnB
1. Summer	a. leaving the land fallow.
2. Winter	b. fertilizing the soil and sowing seeds
3. Autumn	c. weeding and loosening the soil.
4. Spring	d. harvesting and storing.
	e. crop rotation.

Answer 1.(c) 2.(a) 3.(d) 4.(b)

Question 3

[Applying]

In many places in Bhutan, the land is left uncultivated during winter mainly because of the low output from the farms. What measures can we take to increase the yield during winter?

Answer -Introduce greenhouse cultivation.
-Provide sufficient water supply.

Question 4**[Analyzing]**

Summer and winter monsoon winds have a great influence on the farming activities in Bhutan. Which wind has a greater impact? Why?

Answer Summer monsoon. The wind blowing from sea to land during summer is laden with moisture and brings plenty of rain which helps in the cultivation of crops.
Winter monsoon. Although the winter monsoon makes the weather conditions cold and dry, the small amount of rain we receive in late autumn or early winter helps in the cultivation winter crops such as wheat, buckwheat, barley and others.

Question 5**[Evaluating]**

In our country crops are mainly grown in summer. Do you agree? Why?

Answer **Yes.** The abundance of moisture and high temperature in summer encourage the farmers to grow a wide range of fruits and vegetables.

No, because the farmers in many places in Bhutan can grow crops in other seasons too. For instance, in the foothills farmers grow different varieties of crops like wheat, buckwheat, mustard and many other vegetables in winter.

Question 6**[Creating]**

If you were the agriculture minister, what initiatives would you introduce to improve the quality of farm products?

Answer

- Encourage organic farming.
- Provide better incentives to the farmers.
- Improve access to market.
- Make rural financial schemes more attractive.
- Initiate effective cooperative farming.

CHAPTER THREE-THE LIVING FOREST

Learning outcomes

At the end of the lesson, a student should be able to:

3.1 Explain the four types of forest in Bhutan

Question 1

[Remembering]

Blue pine is best grown in.....

- A cool broadleaved forest.
- B the subtropical forest.
- C the temperate forest.
- D the alpine forest.

Answer: C the temperate forest.

Question 2

[Understanding]

Complete the table given below:

Zone	Altitude	Vegetation
Subtropical forest	200m-2000m	
Cool broadleaved forest		Thonpshing, Ghum, Bangka shing, Sisi
	3000m-3800m	Hemlock, fir, juniper
Alpine forest		Dwarf rhododendron

Answer:

Zone	Altitude	Vegetation
Subtropical forest	200m-2000m	Acacia, Sisoo
Cool broadleaved forest	2000m-3000m	Thonpshing, Ghum, Bangka shing, Sisi
Temperate forest	3000m-3800m	Hemlock, fir, juniper
Alpine forest	Above 4000m	Dwarf rhododendron

Question 3

[Applying]

The picture given below shows a type of forest found in Punakha. Identify the type of forest and explain how this forest would help the people of Punakha economically.



Answer: The picture shows the temperate forest. The following will be the benefits that people of Punakha would gain from the forest:

1. Timber products.
2. Bamboo products.
3. Wild vegetables such as ferns, patsha and fodder.

Question 4

[Analyzing]

Bhutan is divided into four vegetative zones. Although each zone differs from the other, there are certain similarities. What similarities can you observe between cool broadleaved forest and temperate forest?

Answer: We can find blue pine and cypress in both the forests. We can also find species of oak and spruce.

Question 5

[Evaluating]

Bhutan has a policy of maintaining a minimum of 60 percent of the land under forest cover for all times. Do you think the policy is good for the country? Support your answer with valid views.

Answer: **Yes**, the policy is good for the country. If the policy isn't maintained the forest in our country will disappear and will result in following problems:

- There will be extremes of temperature making living conditions difficult.
- There will be scarcity of water.
- There will be increase in carbon emission and reduction in oxygen level.

No, the policy is not good for the country because people cannot use the forest resources for economic benefits.

- The number of wild animals will increase leading to greater human-wildlife conflict.

Question 6

[Creating]

The table given below shows the main problems faced in different vegetative zones. Imagine you are the Dzongkhag Forestry Officer in the sub alpine zone. Frame some policies you would adopt to combat the main problems in your area.

(Key: √ - existing problems and X- non existing problems)

Main problems	Alpine zone	Sub Alpine	Temperate	Sub Tropic	Tropical
Shifting Cultivation	X	√	√	√	√
Overgrazing	√	√	√	√	√
Over harvest of fuel wood	√	√	√	√	√
Over harvest of medicinal plants	√	X	X	X	X
Over tapping of resin	X	√	X	X	X
Over harvest of hard wood	X	X	√	X	√
Forest destroyed by fire	X	X	√	√	√
Forest fire	√	√	√	√	√
Poor logging methods	X	√	√	√	X
Presence of predators	√	√	X	X	X
Poaching of wild animals	X	√	√	√	√
Mining damage	X	X	X	√	√

Answer: i. Discourage shifting cultivation.
 ii. Implement the government policies strictly.
 iii. Restrict cutting of trees in the riparian areas.

3.2 Find out the types of animals found in each type of forest in Bhutan.

Question 1

[Remembering]



The animal shown in the picture is found in.....

- A Alpine vegetation.
- B the temperate zone.
- C cool broadleaved forests.
- D the sub-tropical forests.

Answer: D the sub-tropical forests.

Question 2

[Applying]

The White-Bellied Heron lives in the range of 2000m-3000m above the sea level where the vegetation consists of a mixture of deciduous and evergreen trees. These birds are very few in number and are likely to extinct. Suggest **TWO** measures to conserve and increase the population of the birds.

- Answer:
1. Create a sanctuary where birds can breed.
 2. Conserve their habitat.

Question 3

[Analyzing]

Study the table given below carefully and write down which Dzongkhag’s land use pattern would have an adverse effect on the wildlife. Give **THREE** reasons to support your answer.

Dzongkhag	Natural Forest Area (1000 ha)								
	FS	AT	FP	H	P	A	SE	O	Total
Gasa	62.32	0.13	0.00	0.00	23.31	0.63	0.00	272.38	441.25
Paro	7.92	0.03	0.29	.52	8.17	7.27	0.03	28.80	128.60
Punakha	5.16	0.01	0.00	0.03	1.87	4.59	0.07	3.83	97.50
Samtse	2.04	2.69	1.85	1.41	0.13	22.17	0.13	4.37	158.81

Source: Forest Resource Assessment 2000 classification, FAO, 1999)

Key: (FS-Forest shrub, AT-Shifting cultivation, FP-Forest plantation, H-Horticulture, P-Pastures, A-Agriculture, SE-Settlement, O-other)

Answer: The land use pattern of Samtse would adversely affect the wildlife because more human activities such as shifting cultivation, horticulture, pasture land, settlement and agriculture are taking place compared to other districts.

Question 4

[Evaluating]

The Royal Bengal Tigers are on the verge of extinction. The government of Bhutan has adopted a policy on the preservation of these tigers. Do you think the government has taken the right decision? Justify with **TWO** reasons.

Answer: **Yes** the government has taken right decision to preserve them. If the tigers are preserved, balance in the ecosystem will be maintained.

No, if the number of tigers exceed the number of herbivorous animals, it will upset the ecosystem.

Question 5

[Creating]

Currently, Bhutan has established nine protected areas as nature reserves, wildlife sanctuaries and conservation areas. Suppose you are establishing a sanctuary. Design a proposal for establishing a new sanctuary.

Answer: Objectives – i. to preserve the rare species.

ii. to preserve forest.

Location: Pelela (Wangduephodrang).

Area of land: 200 hectares.

Estimated Budget: 5 million.

3.3 Locate the types of forest in the outline map of Bhutan.

There are **FOUR** words hidden in the puzzle. Find them.

T	B	O	Y	C	S	O	C	O
H	T	R	E	E	L	I	N	E
F	O	O	B	A	Y	E	S	N
E	G	H	F	T	W	X	Z	I
G	A	F	I	S	H	R	I	O
N	U	D	T	K	V	S	F	Q
B	L	U	E	S	H	E	E	P

Answer: TREELINE, BLUESHEEP, BUFFALO, SISI,

CHAPTER FOUR-THE FRAGILE FOREST

Learning outcomes

At the end of the lesson, a student should be able to:

4.1 Discuss why forest is considered as a valuable and renewable natural resource.

Question 1

[Remembering]

Forest is a source of raw materials for industries. Name TWO raw materials we obtain from forest.

Answer -Wood.
 -Bamboo.
 -Medicinal herbs.
 -Fruits and vegetables.

Question 2

[Understanding]

The number of people harvesting ‘yartsa guenbub’ is increasing every year. Explain why yartsa guenbub is gaining popularity.

Answer It is gaining popularity because of its medicinal properties and rarity. It is also a lucrative business and has improved the quality of life of the highlanders.

Question 3

[Applying]

Ap Jambay earns his livelihood by selling bangchung. However, the dwindling number of bamboo in the forest makes it difficult for him to obtain the raw material. Suggest four ways that will enable him to earn his living by using alternative forest resources.

Answer -Collect fruits and vegetables from the forest.
 -Collect medicinal plants.
 -Extract timber.

Question 4

[Analyzing]

Bhutan is one of the richest countries in terms of environmental endowment. What benefits do we reap because of this wealth?

Answer -Generate revenue from the sale of hydroelectricity, wood products and medicinal herbs.
 -Rich forest cover ensures perennial source of rivers.
 -Tourist attraction.

Question 5

[Evaluating]

Forest is a source of different nutritious fruits and vegetables. Can we rely on wild vegetables alone and stop carrying out vegetable gardening? Justify.

Answer **Yes**, wild fruits and vegetables are readily available in the forest. It doesn't require hard work since they grow naturally in the wild.
No, because we cannot obtain a great variety of vegetables and fruits. At the same time, the supply of wild fruits and vegetables will not be constant due to factors like increasing population and climate change. It will consume time to gather the fruits and vegetables every time.

Question 6

[Creating]

People exploit natural environment for their benefit. The existing environmental laws have not been effective in curbing forest degradation. Write a slogan to create awareness on preservation of forest.

Answer - 'Nurture nature, nature nurtures'

4.2 Explain why Bhutan was known as the land of herbal medicines in the past.

Question 1

[Remembering]

Match each item in column A against the correct item in column B.

A	B
1 Purifies air	a spring
2 Protects top soil	b trees
3 Impure air	c roots
4 Drinking water source	d carbon dioxide
	e contaminated water

Answer: 1.(b) 2.(c) 3.(d) 4.(a)

Question 2

[Understanding]

Bhutan's forest contains varieties of herbal plants which are used to produce medicines. The extraction of medicinal herbs is protected by law. What might happen if the law did not exist?

Answer -Over harvesting of herbs would lead to extinction of some plant species.
-There will be shortage of raw materials for the production of indigenous medicine.

Question 3

[Applying]

The precious forest is being degraded at an alarming rate for human development. What changes and adjustments would you make as an educated citizen to reduce our dependence on forest?

Answer -Make extensive use of hydropower.
-Minimize the use of forest resources for constructions.
-Limit the population of livestock by raising of hybrid animals.
-Discourage shifting cultivation.
-Proper implementation of the government's law of maintaining 60% forest coverage.

Question 4

[Analyzing]

In many parts of Bhutan, there is an acute shortage of drinking water. What ideas would you apply to ensure a continuous supply of clean drinking water to the rapidly growing population?

Answer -Reduce destruction of forest.
-Afforestation, reforestation.
- Control population growth.

Question 5**[Evaluating]**

Allopathic medicines are better than the traditional medicines. Defend or refute the statement.

Answer

- Allopathic medicines are better because, allopathic medicines can cure diseases faster. It is safe as it is scientifically tested. It is readily available during emergency medical conditions.
- Traditional medicines are better because they can be used to treat persistent illness such as migraines and arthritis. It can be easily grown at home and is more convenient for minor cases. It has no side effects.

Question 6**[Creating]**

Herbal medicine is gaining popularity in our country. People collect the herbs from the forest for their income. Design an awareness poster to minimize the exploitation of medicinal herbs.



4.3 Describe the causes and effects of forest degradation.

Question 1

[Remembering]

The destruction of forest will cause the land to change into a wasteland. This process is called _____.

Answer desertification

Question 2

[Understanding]

Look at the pictures and say what has caused the destruction of trees.



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www.minnpost.com



www.ext.nrs.wsr.edu

Answer Bark Beetles.

Question 3

[Applying]

Z	H	O	U	S	E	R	O	S	E	E	F	N
H	E	R	D	R	O	U	G	H	T	R	E	O
F	A	M	I	N	E	T	E	O	N	E	F	S
A	T	E	S	L	E	E	T	O	S	E	L	U
T	I	T	E	X	T	I	N	C	T	I	O	N
O	M	U	A	G	E	T	S	E	R	C	O	L
S	E	I	S	L	A	N	D	S	L	I	D	E
C	U	P	E	U	R	O	P	T	O	R	S	W

Find out SEVEN causes of deforestation from the word search puzzle.

Answer -Heat
 -drought
 -famine
 -disease
 -extinction
 -flood
 -landslide

Question 4

[Analyzing]



Figure 1

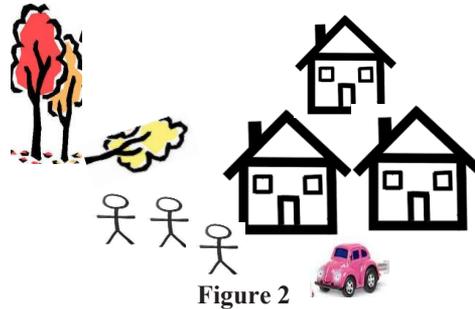


Figure 2

Compare figure 1 with figure 2 and discuss the relationship between human population and environment.

Answer In figure 2 the trees are being degraded to create space and obtain resources for human settlement. With the increase in the number of people more pollutants are released into the environment causing further destruction of forest.

Question 5

[Evaluating]

People have been using products from the forest since time immemorial. In recent years exploitation of forest has assumed a commercial scale. Should we encourage large scale logging operations in Bhutan? Justify.

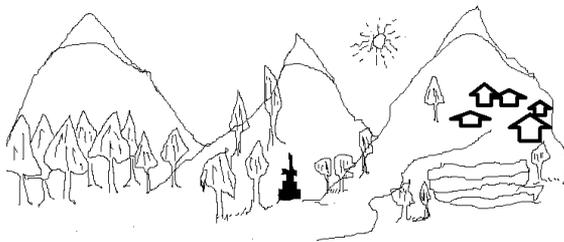
Answer **-Yes**, Bhutan is a developing country and we require an enormous amount of raw materials for laying infrastructures. We can obtain a constant supply of building materials from the forest.

-No, because the logging activities will challenge the policy of maintaining 60% of total land under forest cover. It will also result in desertification and lead to sudden increase in temperature. |Our country will lose its pristine natural vegetation.

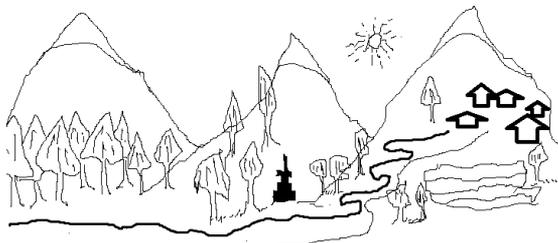
Question 6

[Creating]

You are an environmental officer. Show how you would align an environment-friendly road in the diagram given below:



Answer



CHAPTER FIVE- THE RIVER SYSTEMS IN BHUTAN

Learning outcomes

At the end of the lesson, a student should be able to:

5.1 Identify the different sources of rivers.

Question 1

[Remembering]

One of the main sources of river in Bhutan is.....

- A lakes.
- B springs.
- C glaciers.
- D rain water.

Answer: glaciers.

Question 2

[Understanding]

Springs and rain water are important sources of our rivers. What would happen if the existing vegetation is destroyed?

Answer: The water source would dry as there is no vegetation cover to hold the water.

Question 3

[Applying]

Spring is the main source of water for people living in Thinleygang. The volume of water in the area is shrinking every year due to increasing human settlement. Suggest **TWO** ways to sustain the water source in future.

Answer:

1. Protect the water source.
2. Plant trees around the water source.
3. Clean the water source.
4. Fence the water source.

Question 4

[Analyzing]

The pictures given below show two different scenarios with regard to availability of water. What could have caused the situation in figure (b)?



Figure A



Figure B

Answer: Deforestation
Construction activity

Question 5

[Evaluating]

Water cycle is an important source of water for our rivers. Do you agree? Support your answer.

Answer: **Yes.** There will be no rainfall in absence of water cycle.
No. There are other sources of water like glaciers and lakes.

Question 6

[Creating]

Glaciers are the main source of rivers in Bhutan. You are a glacial geologist and have studied glaciers of our country for a year. Based on your study what mitigation measures would you frame to prevent glacial floods in future?

Answer: Lower the water level of the glacial lakes.
 Install flood warning system.

5.2 Discuss the formation of five main drainage basins in Bhutan.

Question 1

[Remembering]

State whether the following statements are **TRUE** or **FALSE**:

- a. The boundary between two drainage basins is called the watershed.
- b. Haa chhu and Dang chhu are two main tributaries of the Wang chhu.

Answer: a (True), b (False)

Question 2

[Understanding]

The following are the tributaries of Manas river EXCEPT

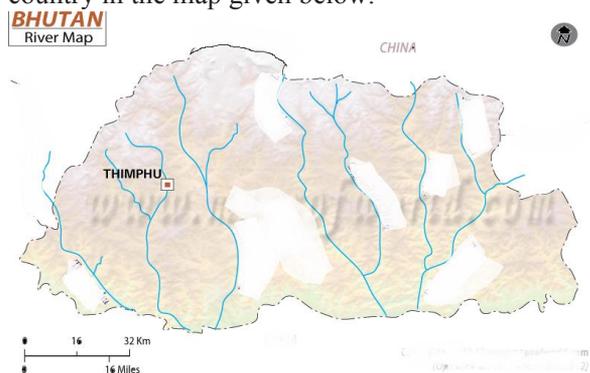
- A Chamkhar chhu
- B Mangde Chhu
- C Dangme Chhu
- D Dang Chu

Answer: Dang Chhu.

Question 3

[Applying]

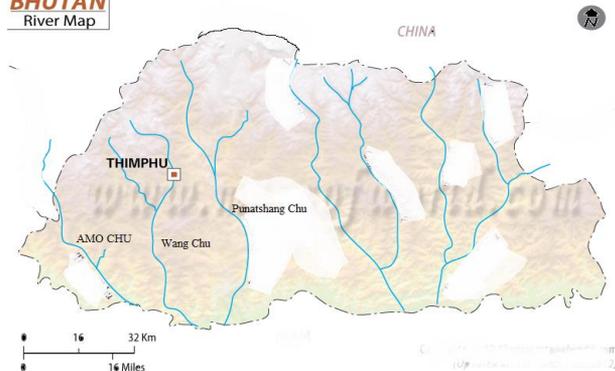
Identify and locate the rivers which have been used for the generation of hydro-electricity in our country in the map given below.



Amo Chhu, Puna Tsang Chhu, Wang Chhu, Mangde Chhu

Answer:

BHUTAN
River Map



Question 4

[Analyzing]

The global food sector which uses 70% of the world’s fresh water faces problems of water scarcity and pollution. How will they affect human lives?

Answer: There will be shortage of safe drinking water.
Insufficient water for irrigation will result in low agricultural output.
Cause severe health problems.

Question 5

[Evaluating]

As a tribute to the fourth DrukGyalpo on his 60th birth anniversary, the National Environment Commission (NEC) Secretary, Ugyen Tshewang said the Bhutan will be the first country to declare a protected river system. Do you agree? Justify.

Answer: **Yes.** People will have access to safe drinking water.
Protection of aquatic species.
Generation of hydro-electricity.
No. There will be financial burden for the government.
The framers will be deprived of water for irrigation.

Question 6

[Creating]

The mountain ranges in Bhutan generally run in a North-South direction which leads to the formation of dendritic river pattern. Suppose the Greater Himalayas ran in an East-West direction, what type of drainage patter would there be?

Answer:
Note: the diagram should be as per the description given below.

1. The pattern of the rivers would change leading to a change in drainage basin.
2. We would experience different growing patterns of our crops.
3. Rivers would flow either to Tibet or Burma.

5.3 Explain the various land features created by rivers at different stages.

Question 1

[Remembering]

Which of the following features are formed due to the deposition of rock materials and silt?



1

2

3

4

Answer: 4 Alluvial Fans

Question 2

[Understanding]

Following are the land features formed by the running water in the upper course. Look at the pictures and write down the names of the following land features.



1

2

3

4

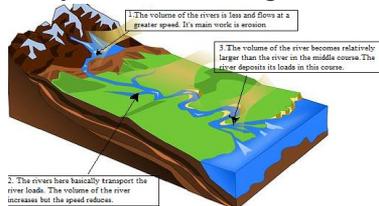
Answer:

1. V shaped valley 2. Broad valley 3. Water fall 4. Alluvial fans

Question 3

[Applying]

Study the information given in the diagram and answer the following question:



In the boxes given below, write down the names of the land features formed by the river in each course.

Upper course	Middle course	Lower course

Answer:

Upper course	Middle course	Lower course
V-shaped valley Water fall and gorges Interlocking spurs and rapids Potholes	Broad valley	Alluvial fans

Question 4**[Analyzing]**

Broad valleys are formed when the river flows over hard rocks causing more lateral erosion than vertical erosion. If the valley of Paro had soft rocks underneath, how would the valley be different?

Answer:

1. There would be deep valleys and gorges.
2. There would not have been paddy fields for cultivation.
3. The gradient of land would be steep, thus there would be less settlement.
4. Irrigation would be difficult.

Question 5**[Evaluating]**

Alluvial fans are considered more fertile than the other land features. Hence, people mostly choose this land feature for their settlement. Do you agree? Justify.

Answer:

- Yes.** Alluvial fans are the deposition of fertile soils, good for cultivation. Irrigation will not be a problem.
- No.** The possibility of floods is quite high. The place is not spacious.

Question 6**[Creating]**

There are various land features formed by rivers in Bhutan. Choose one of the land features and write a proposal to the Tourism Council of Bhutan on how you are going to develop that land into an attractive tourist destination.

Answer:

- Title of the proposal: Eco friendly Park
- Objective: To promote Ecotourism
To preserve nature.
Create employment opportunities.

Facilities to be created: Making of gazebos, bird watching, swimming and site seeing.

Construction of canteens and restrooms.

5.3 Assess the impact of land features formed by rivers on human activities.**Question 1****[Analyzing]**

Lhuentse is located in the upper course of a river. The work of the river in the upper course is mainly erosion. How does the land feature affect the human activities?

Answer:

1. Scattered settlement.
2. The fertility of the soil is lesser than the soils in the lower valley.
3. Terraced farming.
4. Large scale farming may not be possible.
5. Difficult to irrigate their farms.

Question 2**[Creating]**

Farmers in Bhutan lose large part of their land to natural disaster. If you were an agriculture extension officer in your area, what suggestion would you give to people to reduce the loss of land?

Answer:

- Promote the plantation of fast growing and long rooted plants.
Develop terracing.

CHAPTER SIX- SOILS

Learning outcomes

At the end of the lesson, a student should be able to:

6.1 State the importance of soil in the lives of humans.

Question 1

[Remembering]

Name two animals that live in soil.

Answer ants, earthworms, rats, rabbits etc.

Question 2

[Understanding]

Soil is polluted deliberately. Suggest two source of soil pollution.

Answer Industrial waste and use of chemicals like pesticide, weedicide, fungicide etc.

Question 3

[Applying]

Complete the following sentences by choosing the correct word given in the box:

Drainage	bacteria	minerals
----------	----------	----------

- There are many organisms like _____ and fungi in the soil.
- Organic matter in the soil contains essential _____.
- Soils differ in terms of fertility, texture and _____.

Question 4

[Analyzing]

Match each item in column A against the correct item in column B.

A	B
1 Growing crops	a fossilization
2 water harvesting	b decomposition
3 Sprouting of seeds	c agriculture
4 Helps in decaying	d germination
	e stream

Answer 1.(c) 2.(e) 3.(d) 4.(b)

Question 5

[Evaluating]

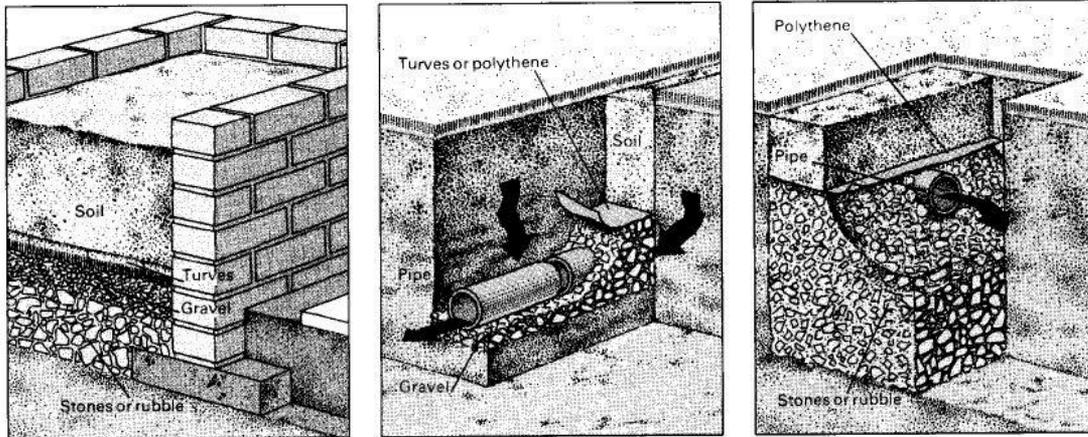
Soil fertility and drainage are of particular importance for cultivation. Which one of the two do you think is more important? Justify your answer?

Answer: Soil fertility is more important because without nutrients nothing can be grown whereas some crops can be grown in a poorly drained soil.
Drainage is more important because soil drainage will directly affect the fertility of the soil.

Question 6

[Creating]

You have planned to return to your village as an educated farmer. Design a model to show the importance of soil drainage to the illiterate farmers.



Answer -Raised bed: Make the bed 12-24in (30-60cm.) high. Place stones at the base, followed by gravel and a layer of turves, then fill with good soil.

Pipes

Whether leading to a ditch or a soak away, lay the earthenware pipes on a gravel base. Cover with more gravel, then a layer of curves or polythene.

Soak away

Make the pit as large as possible — at least a cubic yard — and fill with stones. Before placing soil on top, cover with polythene sheet.

6.2 Explain the process of formation of soil.

Question 1

[Remembering]

Choose the most appropriate response.

The soil best suited for agriculture is

- A sandy soil.
- B coarse soil.
- C alluvial soil.
- D sub-soil.

Answer C alluvial soil.

Question 2

[Understanding]

Choose the correct word given in the bracket and fill in the blanks.

[Weathering, cracks, freezes, expands]

Rain water seeps in between the ____1____ in the rocks. The water ____2____ and ____3____ making the spaces even larger. This is how frost action leads to ____4____ of rocks.

Question 3

[Applying]

Ap Lhatu has been planting potatoes in his garden for two years in a row. In the third year, he did not have a good yield. Educate him on at least three methods of improving soil quality.

Answer -Crop rotation
 -Organic farming
 -Growing leguminous plants.

Question 4

[Analyzing]

Bhutan is largely an agricultural society. Yet, we are heavily dependent on India for agricultural products. Explain why this is so with regard to relief features and soil quality.

Answer -Small land holding due to shortage of arable land.
 -Reduction in the size of land due to land fragmentation.
 -Presence of poor quality mountain soil.

Question 5

[Evaluating]

The two diagrams below show two forms of weathering. Which of the two forms is more common in your vicinity? Why?



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www.webspace.ship.edu

Answer Weathering due to wedging action of ice is more prominent where I live, because my village is situated at 3000m above sea level where ice formation is a common feature for most part of the year.
 Weathering due to wedging action of trees is more common in my village since my village is situated at the edge of the thick forest. We can see the wedging action happening just beyond the farm boundary.

Question 6

[creating]

Aum Kuchum’s field is full of boulders and stones. This has severely affected the output from her farm. Suggest TWO ways that will help speed up the rate of soil formation.

- Answer
- Provide feasible conditions for faster decomposition of plants matter.
 - Break the rocks or remove them.
 - Use manure to help decomposition of soil particles.

6.3 Discuss the causes of soil erosion.

Question 1

[Remembering]

Complete the sentence below with the correct word.

Soil erosion is a problem in many places in Bhutan. To prevent erosion, it is important not to leave the soil exposed to.....on the slopes.

- Answer
- rain.

Question 2

[Understanding]



Look at the picture closely and find out what is happening in the region.

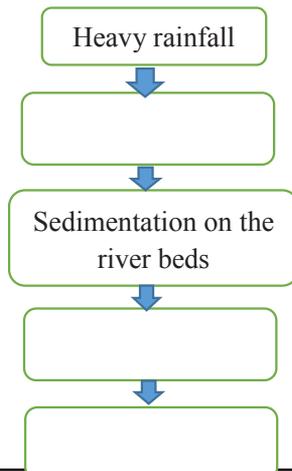
- Answer
- wind erosion.

Question 3

[Applying]

Complete the flow chart with the appropriate phrases given below:

Increase run off, shallow river beds, decline in fish population.

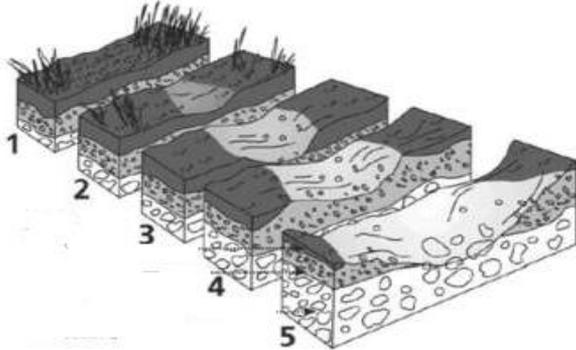


Answer Heavy rainfall → surface run off, → sedimentation on the river beds, shallow river beds, → decline in fish population.

Question 4

[Analyzing]

Examine the diagram below carefully. What conclusions can you draw from the picture?



www.dartmoor-npa.gov.uk

Answer The figures show the process of soil erosion. In the beginning, the land has plenty of top soil. Gradually the thickness of the top soil is reduced due to gully erosion. Overtime, all the top soil is removed and the parent rock is exposed to the surface.

Question 5

[Evaluating]

Both human and nature play their part in eroding the soil. Between the two, the effects of human are greater. Do you agree? Justify.

Answer **Yes.** Soil erosion through natural causes often takes a longer period of time whereas soil erosion due to human interference happens within a short time.
No, the soil in the mountainous country like ours is being eroded constantly even without human interference.

Question 6

[Creating]

The growing number of people puts more pressure on the land leading to increase in the rate of soil erosion. Design a poster to advocate the prevention of soil erosion.

Answer



www.idd.go.th

Make terraces to prevent top soil.

CHAPTER SEVEN-MANAGEMENT OF THE NATURAL ENVIRONMENT

Learning outcomes

At the end of the lesson, a student should be able to:

7.1 State the importance of managing the natural environment and the proper use of resources such as forest, water, land and minerals.

Question 1

[Remembering]

Management of the natural environment means

- A proper use of the environment.
- B exploitation of the environment.
- C proper use of water.
- D proper use of land.

Answer: A Proper use of the environment.

Question 2

[Understanding]

Following are the advantages of having trees EXCEPT:

- A reduces floods.
- B provides fresh air.
- C reduces soil erosion.
- D produce carbon dioxide.

Answer: D Produce carbon dioxide.

Question 3

[Applying]

Environment is under threat from the nature as well as and humans. Look at the picture given below and write down some ways to curb these problems.



Answer:

- Minimizing effects on the environment while constructing roads and other infrastructures.
- Carrying out reforestation and afforestation.
- Limiting the number of industries and factories.
- Conserving homes of animals and managing land.

Question 4**[Analyzing]**

Bhutan is dependent on hydroelectricity for economic development. How do you think the preservation of forest will sustain the generation of electricity?

Answer: Forest helps more water to percolate into the soil ensuring a continuous flow of rivers which is the main resource to generate electricity. There will be less erosion and landslides which affect electricity generation.

Question 5**[Evaluating]**

Both economic development and management of environment are essential. Which one do you think is more important? Justify.

Answer: Economic development is more important to me. Our country is less developed and unemployment rate is quite high. So our country has to develop to improve the standard of living of the people and enhance their wellbeing.
Management of environment is more important to me. If we do not take care of the environment, the country will face innumerable problems such as environmental pollution, global warming, floods and epidemics.

Question 6**[Creating]**

Management of environment is an international issue. Suggest some ways to improve the living standards of the people by managing environment.

Answer: Making use of renewable resource such as water to generate electricity.

Making parks, bird watching, rafting and tourist attractive places for income generation.

7.2 Show the relationship between forest cover and water resources.

Question 1

[Remembering]

A process in which rock particles present in water settle down is called:

- A Filtration
- B Decantation
- C Sedimentation
- D Evaporation

Answer: C Sedimentation

Question 2

[Understanding]

Which activity is best described by the picture given below?



- A Afforestation.
- B Deforestation.
- C Reforestation.
- D Degradation.

Answer: C Reforestation.

Question 3

[Applying]

Water is essential for sustaining the life of humans and animals on the earth. Suggest TWO ways to maintain the continuous supply of water for the sustenance of life.

Answer: Preserving the forest
Protecting the water source

Question 4

[Analyzing]

The pictures given below show two different scenarios related to land management. What can you conclude from the given pictures?

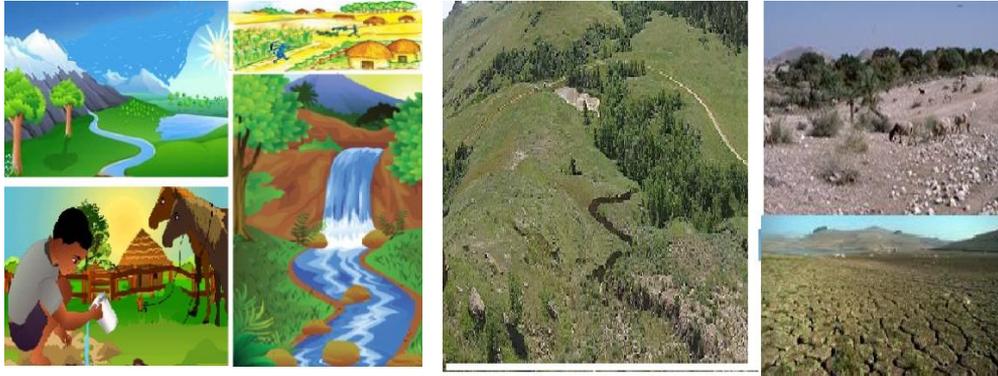


Fig. (A)

Fig. (B)

Answer: The first picture shows that life cannot be sustained without forest. On the other hand, the second picture indicates that forest is fundamental to support life on earth. Forest is important to sustain the water sources.

Question 5

[Evaluating]

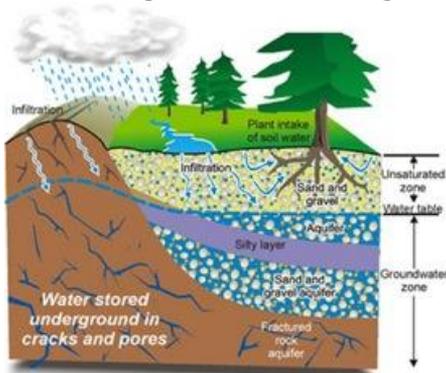
Natural environment is a primary source of all the resources. Do you think the role of managing the natural environment in our country lies on the government alone? Give **TWO** reasons to support your view.

Answer: **Yes.** The management of natural environment is a complicated task as it will require huge financial and skilled human resource.
No. It will be burdensome for the government alone to manage the natural environment.
 People should understand that managing the natural environment is a collective responsibility.

Question 6

[Creating]

Water resource management is important to maintain co-existence between environment and humans. Prepare a model showing the effective conservation of water resources.



7.3 *Analyze the impacts of mineral extraction on environment.*

Question 1

[Remembering]

Which one of the following materials can be reused?

- A Electronic gadgets
- B Melamine
- C Cement
- D Glass

Answer: Glass

Question 2

[Understanding]

The picture given below shows an open cast mining.



What are some of the effects of open cast mining?

- Answer:
1. Land degradation
 2. Deforestation
 3. Air Pollution

Question 3

[Applying]

Large scale mineral extraction has resulted in extensive degradation of land. Suggest some ways to reclaim the land.

- Answer:
- We can refill the degraded land with top soil to make it productive for agriculture.
 - We can also do reforestation.

Question 4

[Analyzing]

Mineral extraction has many impacts on the environment. Do you think the government owned enterprises will have lesser than the private enterprises?

- Answer:
- I think the government owned enterprises will have least impact on the environment since they will follow the rules and regulations and always think of sustainability.
 - I think the private enterprises will have least impact on mineral since they will more careful about what they do to meet the rules and regulations set by the government.

Question 5**[Evaluating]**

The natural environment has two main threats: man-made and natural disasters. Which one has a greater effect on environment? Justify.

Answer: The man-made threats have greater effects on environment because it is very fast and it happens on a larger scale. The man-made disasters happen at a greater frequency while the natural disasters happen once in a while. Natural disasters occur at a larger scale which will result in enormous loss of the environment. Moreover natural disaster cannot be prevented.

Question 6**[Creating]**

You own land and you want to lease it to a private enterprise for mineral extraction. Frame some terms and conditions for leasing the land.

Answer: Terms and conditions for leasing the land.

1. The monthly rental charge - Nu.10, 000 .
2. The land will be leased for a period of 5 years.
3. Land reclamation and reforestation should be done.

EARTH AND ITS PEOPLE

CHAPTER ONE-ATMOSPHERE- STRUCTURE AND TEMPERATURE

Learning outcomes

At the end of the lesson, a student should be able to:

1.1 Describe the structure of the atmosphere.

Question 1

[Remembering]

The atmosphere is made up of a mixture of gases. Which one of the following is the most abundant?

- A. Argon
- B. Carbon dioxide
- A. Oxygen
- B. Nitrogen

Answer Nitrogen

Question 2

[Understanding]

There are names of six atmospheric gases hidden in the puzzle. Find them.

K	R	Y	P	T	O	N	C	T
H	A	E	M	E	X	S	A	O
H	S	R	P	H	Y	E	R	R
E	E	W	G	A	G	S	B	E
L	N	A	I	O	E	H	O	C
I	K	T	N	A	N	Y	N	L
U	M	E	N	E	T	D	D	H
M	E	R	I	I	G	R	I	N
O	R	V	T	O	S	O	O	P
H	E	A	R	H	R	G	X	E
I	T	P	O	I	A	E	I	S
T	H	O	G	E	M	N	D	O
S	T	U	E	U	N	K	E	N
O	W	R	N	E	O	N	N	X

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Answer:

					O		C	
H					X		A	
H					Y		R	
E		W			G		B	
L		A			E	H	O	
I		T			N	Y	N	
U		E	N			D	D	
M		R	I			R	I	
		V	T			O	O	
		A	R			G	X	
		P	O			E	I	
		O	G			N	D	
		U	E				E	
		R	N					

Question 3

[Applying]

Read the following clues and complete the given crossed word puzzle

Across

5. The gas that makes up close to one fourth of the air in the atmosphere.
8. The most abundant metal in the mesosphere.
9. The third most abundant gas in the atmosphere.
10. The layer of gas found in the lower layer of the stratosphere.
11. Churning of air in the troposphere helps determine the _____ of a place.
12. The atmosphere is composed of five _____.

Down

1. The force that holds earth's atmosphere in its place.
2. The layer that contains all of the water vapour in the atmosphere.
3. The air in the stratosphere is less dense and _____.
4. The atmosphere protects us is by absorbing solar _____.
6. The most abundant gas in the atmosphere.
7. The wave reflected by particles in the ionosphere.

Question 4**[Analyzing]**

Hydrosphere occupies 71% of the earth's surface. It absorbs much of the oxygen on earth. If 71% of the earth was made up of lithosphere, what kind of atmospheric conditions do you think would prevail?

Answer

- There would be higher concentration of oxygen for animals.
- The atmosphere will be dry due to the lack of oceans and seas.
- Less diversity of aquatic species.

Question 5**[Evaluating]**

There are two factors that cause changes in the atmosphere – natural changes and human activities. Which factor has greater influence? Why?

Answer

Human activities pose greater influence on the atmosphere because burning fossils fuels, use of chemical fertilizers, deforestation and raising of livestock increase the amount of pollutants thereby causing changes in the structure of the atmosphere. Natural changes have greater influence because there is a periodic change in the intensity of sun's energy owing to natural reasons. There can also be shift in ocean currents which will cause temperature change in specific regions because of high specific heat capacity of water.

Question 6**[Creating]**

Describe the conditions that would prevail and the resultant changes in our lifestyles if the Ice Age were to come during our time.

Answer

- Agricultural activities would be impossible.
- Buildings will have to be properly designed to provide warmth which would be expensive.
- Extinction of some animal species.
- Increase in the amount of carbon dioxide.

1.2 Draw and give a brief description of the different layers of the atmosphere.**Question 1****[Remembering]**

Write the name of the layer or part of the atmosphere that answers the riddles. Use the link below to search for the answers.

1. I have the coldest temperature of the atmosphere.
Who am I? [Stratosphere](#)
2. I am where most of the weather occurs.
Who am I? [Troposphere](#)
3. I contain most of the ozone layer.
Who am I? [Stratosphere](#)
4. Artificial satellites orbit the earth here.
Who am I? [Exosphere](#)
5. I protect the earth from meteoroids.
Who am I? [Stratosphere](#)
6. I protect the earth from ultraviolet rays given off by the sun.
Who am I? [ozone layer](#)

7. I am where radio waves are bounced back to the earth's surface.
Who am I? Ionosphere
8. I extend to an average altitude of about 12 km.
Who am I? Troposphere
9. My temperature may reach as high as 2000 degrees Celsius.
Who am I? Exosphere
10. Convection currents are produced in my layer.
Who am I? Troposphere
11. I am the layer that touches the surface of the earth.
Who am I? Troposphere
12. I am the layer that reaches the highest altitude.
Who am I? Exosphere
13. The jet stream is located here.
Who am I? Stratosphere
14. I extend to an altitude from about 50 km to 80 km.
Who am I? Mesosphere
15. I am the layer that interacts with living things.
Who am I? Troposphere
16. I extend upwards from an altitude of about 550 km to 1000 km.
Who am I? Ionosphere
17. The air pressure is the greatest here.
Who am I? Troposphere
18. Electrically charged particles called ions are found here.
Who am I? Ionosphere
19. My temperature drops about 6.5 degrees Celsius per km.
Who am I? Troposphere
20. I extend to an altitude of about 12 km to 50 km.
Who am I? Stratosphere

<http://teachertech.rice.edu/Participants/louviere/riddles.html>

Question 2

[Understanding]

The lower stratospheric layer has an ideal condition for flying. Why?

Answer The absence of weather in the stratosphere makes flying conditions more conducive.

Question 3

[Applying]

Mr. Zhangpola lives at the height of 2300m above sea level. If the temperature decreases by 1°C for every 165m, what will be the average temperature of the place?

Answer 13.94°C.

Solution:

$$1^{\circ}\text{C} = 165\text{M}$$

$$X^{\circ}\text{C} = 2300\text{m}$$

Cross multiply

$$165X = 2300$$

$$X = 2300/165$$

$$X = 13.939393\dots \text{Round off to two decimal place}$$

$$\mathbf{X = 13.94^{\circ}\text{C}}$$

Question 4

[Analyzing]

Temperature of the atmosphere either increases or decreases according to the layers. Compare stratosphere and ionosphere with regard to air temperature.

Answer In the Stratosphere the temperature decreases with the increase in altitude where as in the ionosphere, the temperature increases with the increase in altitude.

Question 5

[Evaluating]

Troposphere and Stratosphere are equally important for living organisms on earth. Do you agree? Justify.

Answer -Troposphere is more important because it controls weather conditions and provides ideal conditions for living.
-Stratosphere is more important because it provides ideal conditions for flying planes. It contains ozone layer that absorbs heat from the sun and does not allow ultra violet rays to enter.

Question 6

[Creating]

Beyond the ionosphere lies the unknown region of exosphere. What ways would you device to make use of the layer for the benefit of mankind in future?

Answer -Build space station.
-Introduce Space tourism.

1.3 Explain the factors affecting temperature.

Question 1

[Remembering]

All of the following conditions cause difference in the amount of heat received by the earth EXCEPT

- A. Angle of the sun's rays
- B. Nearness to water
- C. Altitude
- D. Salinity of ocean.

Answer: Salinity of ocean

Question 2

[Understanding]

Both long-wave and short-wave radiation emit heat. Which is responsible for heating the air around us?

Answer The rays of the sun hits the earth's surface, then it re-radiates from the ground heating the air around us. Thus, long-wave radiation is responsible.

Question 3

[Applying]

State whether the following statements are true or false. Rewrite the false statement correctly.

1. Due to spherical shape of the earth, the sun's rays strike the earth at the same angle.
2. The on-shore winds are responsible for making the summer conditions cooler at the coastal areas.
3. Altitude and temperature are directly proportional.

Answer

1. False

Due to spherical shape of the earth, the sun's rays strike the earth at different angles.

2. True

3. False

Altitude and temperature are inversely proportional.

Question 4

[Analyzing]

Mt. Kilimanjaro is located very close to the equator. Yet, it is a snow covered mountain. Why?

Answer

-This is because altitude is the determining factor for the formation of snow.

Question 5

[Evaluating]

Out of the two factors, altitude and nearness to water, which factor plays a more important role in determining temperature in Bhutan? Give reasons.

Answer

1. Nearness to water – Since Bhutan is situated far away from the sea, there is a huge yearly range of temperature. The summers are hot and winters are cold.
2. Altitude- In a mountainous country like ours, altitude is the single most important factor. The temperature difference within a small area is caused mainly due to the difference in altitude.

Question 6

[Creating]

The spherical shape of the earth is one of the important factors that cause temperature variation. Design a model of a flat earth to show that there would not be any variation in temperature.



-If the earth were flat temperature would be equally distributed all over the world.

CHAPTER TWO-ATMOSPHERE-PRESSURE AND WINDS

Learning outcomes

At the end of the lesson a student should be able to:

2.1 Describe the factors influencing pressure.

Question 1

[Remembering]

a. The ocean of air exerts a pressure of 6500 trillion tons on the earth's surface. The instrument that is used to measure this pressure is

Answer: Barometer.

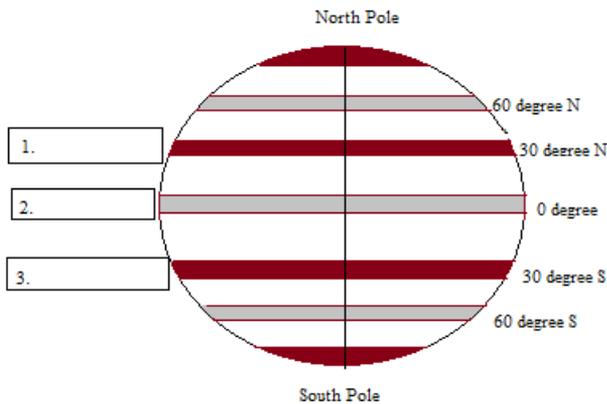
b. The normal air pressure at the sea level is.....mb.

Answer: 1013

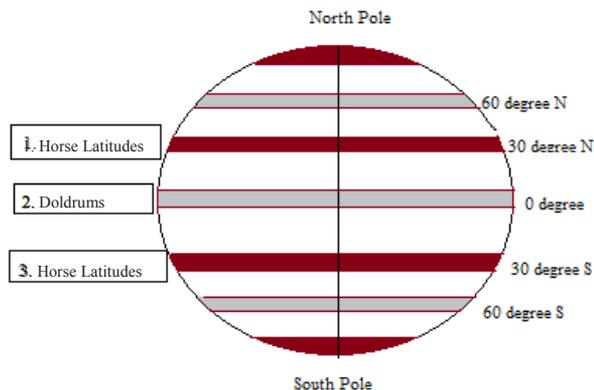
Question 2

[Applying]

The earth's surface is divided into seven pressure belts. Label the figure given with the correct names of pressure belts.



Answer:



Question 3

[Applying]

A man travelling from Punakha to Lunana for the first time experiences severe headache, nose bleeding and becomes short of breath. What precautions would you take against such illness?

- Answer:
1. Supply oxygen.
 2. Ascend gradually.
 3. Descend to lower altitude at once.

Question 4

[Analyzing]

Although the atmosphere, with its enormous weight of 6500 trillion tons, exerts huge pressure on us, we don't feel any weight. Why is it so?

Answer: We do not feel the weight of air because the pressure exerted from outside is balanced by the same amount of pressure from inside our body. Hence, we do not feel the weight of air.

Question 5

[Evaluating]

Of the two factors – height above the sea level and changing temperature – which one has a greater influence on the atmospheric pressure in our country? Give reasons to support your view.

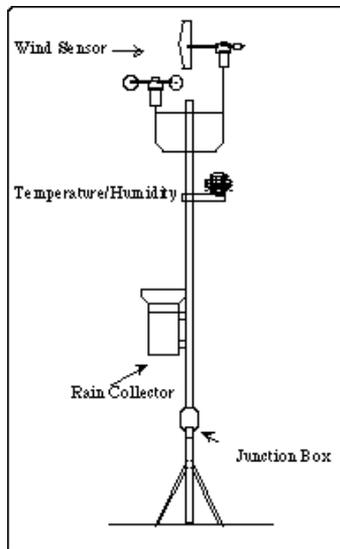
Answer: The height above the sea level has a greater influence on atmospheric pressure. The altitude in Bhutan ranges from 200m in the south to about 7000m in the north. As we go higher the air pressure decreases.
The temperature has a greater influence the atmospheric pressure in Bhutan. Since temperature and pressure are inversely proportional, a slight change temperature causes changes in pressure.

Question 6

[Creating]

You are a geography teacher in a school and you intend to set up a weather station for the school. Design a model of a weather station you wish to set up.

Answer:



2.2 Examine the factors responsible for the development of major pressure belts and the complex pattern of air pressure within these belts.

Question 1

[Remembering]

The winds blow from the sub-tropical highs towards the sub-polar lows in a west-east direction in both the hemisphere. The wind described above is

- A Easterlies
- B Trade winds
- C Polar winds
- D The Westerlies

Answer: The Westerlies

Question 2

[Understanding]

The sub-tropical high pressure belts around 30° N and S latitudes are known as Horse latitudes. Why do you think so?

Answer: The mariners sailing to the newly discovered America with their cargoes of horses were stranded for months in the calm waters of these latitudes. This drained the ship's water reserve. To conserve water the sailors got rid of some of the horses by throwing them into the sea. Thus, these belts were nicknamed as horse latitudes.

Question 3

[Applying]

The pressure belts shift north and south by about five degrees. How does this shift in affect the people living in the Mediterranean region?

Answer: Due to the shift in the pressure belts the Mediterranean regions receive winter rains and have dry summers. This causes a huge change in the human activities and agricultural practices.

Question 4

[Analyzing]

State TRUE or FALSE.

Thailand remains cold throughout the year as it is located far away from the equator.

Answer: False. Thailand remains hot throughout the year as it is located close to the equator.

Question 5

[Evaluating]

Bhutan is located between 26°40' and 28° 20' north of the equator. Do you think it would have been better if Bhutan was located in the equatorial belt? Give reasons.

Answer: **Yes.** We would have experienced hot and wet weather conditions throughout the year. Such conditions will promote quick growth of plants.

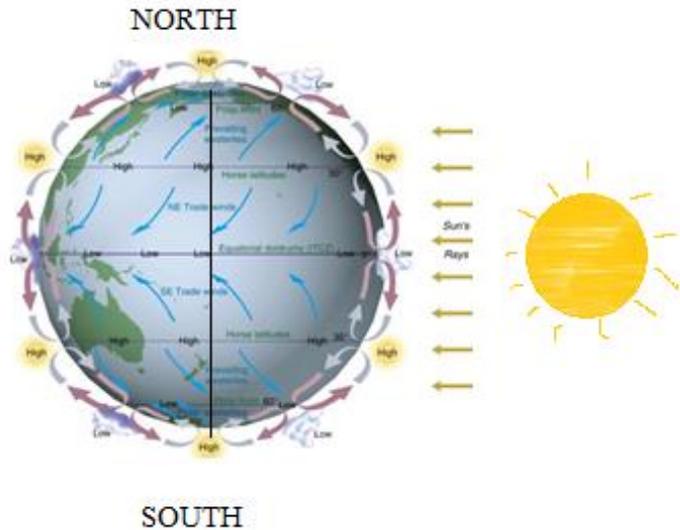
No. Many of the important crops we grow will not survive in hot and wet conditions. The year round heavy downpour will cause floods in a mountainous country like ours.

Question 6

[Creating]

The earth's inclined axis is the main factor that causes variation in temperature. Construct a model of the earth with perpendicular axis to show that there would not be any change in the positions of the pressure belts in summer and winter.

Answer:



2.3 Describe the different types of winds and their effects on the earth's surface.

Question 1

[Remembering]



Winds are of various types and are caused by different factors. The type of wind that you see above is

- A Planetary wind.
- B Periodic wind.
- C Variable wind.
- D Local wind.

Answer: Variable wind.

Question 2

[Analyzing]

Match the items in column A against the correct items in column B. Rewrite the matching pairs.

Column A	Column B
1. They are warm winds, they pick up moisture and are responsible for heavy rainfall on eastern sides of the tropical lands	a. Westerlies
2. They are interspersed by cyclones and cause light drizzle.	b. Jet Streams
3. They are associated with turbulent weather conditions, cloudy weather, strong winds and rainfall.	c. Trade winds.
4. They are used as an aid in weather forecasting.	d. Land breeze
	e. Cyclone

Answer: 1 (c), 2 (a), 3(e), 4 (b)

Question 3

[Applying]

You live in a place located near the sea. In what ways would the location of the settlement influence your lifestyle?

Answer: Our food habits will change since there will be easy access to sea food.
The clothes we wear must be suited to the moderate weather conditions of the place.
The will be an important activity.

Question 4

[Analyzing]

Horizontal movement of air is called wind and all winds are caused by difference in pressure. What is the difference between global and local wind?

Answer: Global winds are permanent that blow in the same direction throughout the year.
Local winds constantly change direction and are mainly stirred up by the difference in temperature and topographical features of a small region.

Question 5

[Evaluating]

Wind power has been used since the early times and is still used today for sailing. Do you think the wind power was more important to the sailors of the olden times than it is today? Provide justifications to support your view.

Answer: Yes. Before the age of machines, sailors mainly depended on wind power for navigation. The direction of wind determined the route taken by the sailors.
No. Since the ships are powered by sophisticated machines now, sailors do not have to entirely depend on winds anymore.

Question 6

[Creating]

Every year, in many parts of our country, windstorms blow away roofs of the houses and cause damage to property. Design a model of a house that is more resistant to windstorms.

Answer:



CHAPTER THREE-ATMOSPHERE, HUMIDITY AND PRECIPITATION

Learning outcomes

At the end of the lesson, a student should be able to:

3.1 Explain why humidity varies from place to place and from time to time.

Question 1

[Remembering]

All the following are true about relative humidity EXCEPT

Relative humidity is greater

A in the upper air than the lower air.

B by day than by night.

C in summer than in winter.

D in the lower air than the upper air.

Answer: A in the upper air than the lower air.

Question 2

[Understanding]

Relative humidity in India is higher than in Bhutan. What could be the possible reasons?

Answer: -Since India is bounded by seas on three sides, the evaporation from the water bodies increases the humidity.

-Hot weather conditions in India cause more evaporation to happen.

Question 3

[Applying]

Summer monsoon brings a huge amount of moisture towards South Asia. In the map given below, shade the region that has the least relative humidity.



Question 4

[Analyzing]

Humidity in Phuentsholing is high. Discuss the advantages and disadvantages of living in such a place.

Answer:

Advantage:

- High humidity is good for skin as it keeps the skin moist and prevents cracking.
- Results in plenty of rain which is good for cultivation of crops.

Disadvantages:

- Makes the weather conditions hotter due to lack of evaporation.
- Heavy downpour causes floods and landslides.

Question 5

[Evaluating]

Humidity of a place affects the density of population. Do you agree? Justify your answer.

Answer

Yes, humid conditions make everything damp and cause mould to develop. Clothes take a long time to dry. Many people may not prefer to live in such places.

No, although the humidity is high around the equatorial region, people have learnt to live without much problem.

Question 6

[Creating]

High humidity in the bathroom deteriorates the air quality at home and causes health problems. Make a design of a bathroom to improve the quality of air.

Answer

- Make better ventilations and use humidity resistant paint.
- Install dehumidifiers and exhaust fans.
- Design larger windows to let out moisture.



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3.2 Discuss the different forms of condensation.

Question 1

[Remembering]

Fill in the blanks with correct answer.

The air becomes saturated at certain temperature with moisture. The temperature at which air get saturated is called _____

Answer -dew point.

Question 2

[Understanding]

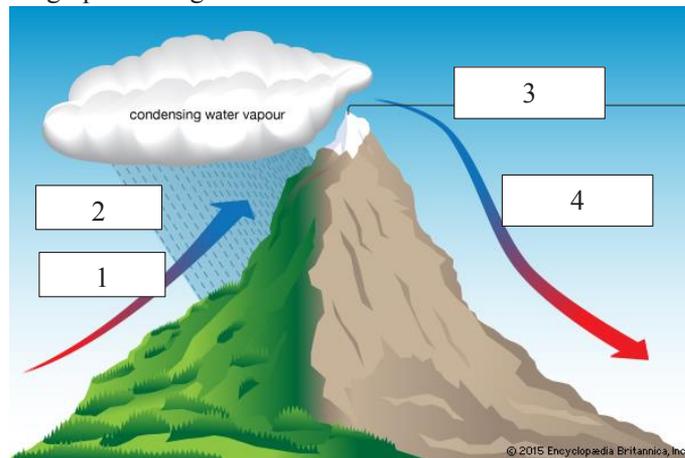
Match the items in column A against the correct items in column B.

A	B
1. Water vapor turns into water droplets	a. Precipitation
2. Tiny feathery ice crystals	b. Condensation
3. Falling down of moisture from clouds	c. Dew and frost
	d. evaporation

Question 3

[Applying]

Mountains play a very important role in the formation of orographic rain. Label the diagram of orographic rain given below:



Answer:

1. Moist, rising air.
2. Precipitation.
3. Rain shadow region
4. Dry, descending air.

Question 4

[Analyzing]

Rearrange the following in the correct order:

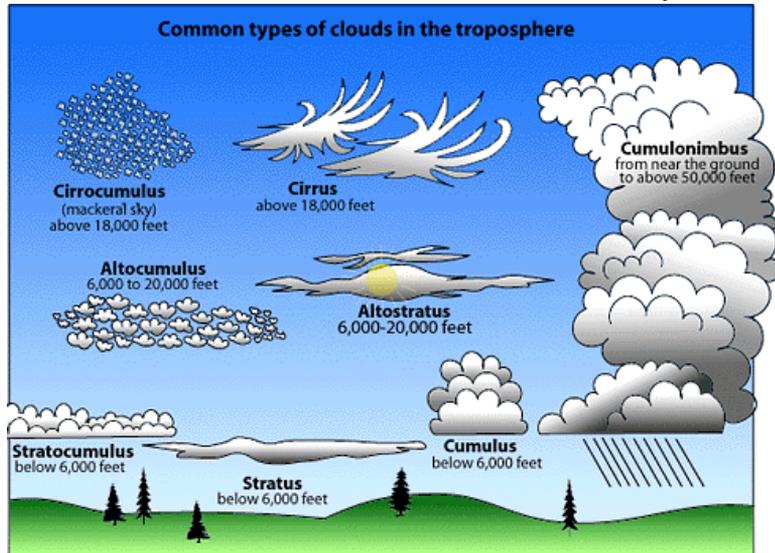
Precipitation – condensation – dew point – evaporation.

Answer Evaporation – dew point – condensation – precipitation.

Question 5

[Evaluating]

Cloud is the key regulator of earth’s temperature. The figure below shows different types of clouds. Between stratus and cumulonimbus clouds, which one do you think has greater effect on weather?



Answer -Cumulonimbus, because it brings heavy showers of rain which greatly reduces the ground temperature.
 -Stratus clouds, because in warmer places it brings light showers and in the colder regions it brings snowfall. It also leads to the formation of fog.

Question 6

[Creating]

You are a Regional Transport Officer. Design a caution signboard to create awareness for the travellers while driving under foggy and misty conditions.

3.3. State the causes of the three types of rain.

Question 1

[Remembering]

Occurrence of dew is a common phenomenon in our country. During which time of the year is dew likely to form?

Answer Dew forms when the ground temperature becomes lower than the air temperature. When the air comes in contact with cold land surface the moisture in the air condenses to form dew drops.

Question 2

[Understanding]

Rain is classified into three different types. Of the three types, which is common in our country? Why?

Answer Relief rain because this type of rain is caused due to presence of mountains. When the moisture bearing winds from the oceans are pushed up the mountains the reduction in temperature causes condensation. Continuous condensation leads to heavy rain.

Question 3

[Applying]

The rapid growth of population has led to expansion of towns and cities resulting in the shortage of resources such as water. Suggest some ways through which we can make proper use of rain to alleviate the problem of scarcity of water.

- Answer
- Rain water harvesting.
 - Recycling of waste water.
 - Educate the people on proper use of water.

Question 4

[Analyzing]

Some regions of the world receive convectional rain while we, in Bhutan, receive relief rain. What are the differences between relief and convectional rain?

Answer:

Relief rain	Convectional rain
-Hills and mountains play a major role in the formation of this rain. -It is a seasonal rain occurring in two seasons in some of the places.	-The rain is caused because of constantly high ground temperature. -Convectional rain is a daily phenomenon at the equatorial region.

Question 5

[Evaluating]

Thunder storms usually take place in spring and autumn. Is it useful to the people in our country?

- Answer
- Yes- Because thunderstorms are usually accompanied by rain it gives a good start for both summer and winter crops.
 - No- Because occurrence of thunderstorms during the growing and harvesting seasons often do damage to the crops.

Question 6

[Creating]

Many farmers believe that rain is the result of some divine intervention. Design an experiment to demonstrate that the formation of rain is a natural phenomenon.



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CHAPTER FOUR –THE HYDROSPHERE

Learning outcomes

At the end of the lesson, a student should be able to:

4.1 Give a description of hydrosphere with regard to oceans, seas and inland water bodies.

Question 1

[Remembering]

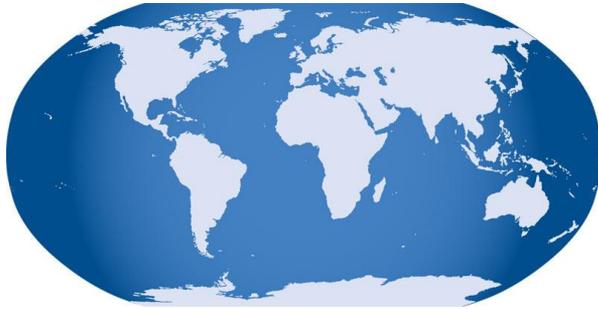
Earth is composed of atmosphere, hydrosphere and lithosphere. What percentage of the earth is composed of hydrosphere?

- A 71%
- B 72%
- C 73%
- D 74%

Answer: A 71%

Question 2

[Understanding]



Study the world map given above and list down any three major oceans of the world.

Answer: Pacific Ocean, Arctic Ocean, Antarctic Ocean, Indian Ocean, Atlantic Ocean.

Question 3

[Analyzing]

Major portion of the earth's surface is covered by oceans. How does the distribution of water influence the climatic conditions in different regions of the earth?

Answer: Places situated close to the sea receive a good amount of rain. Ocean currents can increase or decrease the temperature depending on where they originate.

Question 4

[Evaluating]

Hydrosphere and Lithosphere are important for human survival. Which sphere do you think is more important? Give reasons.

Answer: Hydrosphere is more important because water is one of the key elements that supports life.

Lithosphere is important because without the lithosphere people will have no place to live and carry out farming activities.

4.2 Draw relationship between salinity and temperature of oceans.**Question 1****[Remembering]**

Earth's hydrosphere is best described as the

- A relatively thin layer of water covering most of the earth's surface.
- B thin layer of rocks found above earth's mantle.
- C hot molten rocks found in the earth's mantle.
- D very dense rock located in earth's inner core.

Answer: A relatively thin layer of water covering most of the earth's surface.

Question 2**[Understanding]**

What do you understand by earth's hydrosphere?

- A The gases in the air.
- B All the water on the planet.
- C The solid rocky part of Earth.
- D The study of the Earth's atmosphere.

Answer: All the water on the planet.

Question 3**[Applying]**

You are living in a tropical area where the only source of water is the ocean. How can you remove the salt content and make water drinkable?

Answer: Boil sea water and let the vapour condense. The water thus collected will be without any salt content.

Question 4**[Analyzing]**

Salinity of the ocean varies from place to place. What causes this?

Answer: Usually warmer oceans have higher salinity since the rate of evaporation is higher. This removes water and leaves salt behind increasing salinity.

Question 5**[Evaluating]**

Rivers are of immense use to mankind. They are often called the 'lifeline of a country.' Do you agree? Give reasons.

Answer: **Yes.** Rivers are used for drinking, washing and agricultural purposes. It provides habitat for the aquatic species. The force of rivers can be harnessed to produce electricity. Rivers are also used for navigation.

No. The swelling of the rivers during the monsoon season causes floods that do severe damage to human settlements and aquatic species.

4.3 Explain the types of movements in the ocean.

Question 1

[Analyzing]

State TRUE or FALSE. Rewrite the false statements correctly.

- a. Tides are caused by the gravitational pull of the moon and the sun.
- b. Currents flowing from the equator to the poles are generally cooler than the surrounding water and are known as cold currents.

Answer: a (True),
 b (False). *Currents flowing from the equator to the poles are generally warmer than the surrounding water and are known as warm currents.*

Question 2

[Understanding]

The movements in enclosed water bodies are called waves, currents and seiches. What do you understand by waves?

Answer: Waves are regular, rhythmic rise and fall of water. They are caused by the pushing force of the wind against the surface of water in the oceans.

Question 3

[Applying]

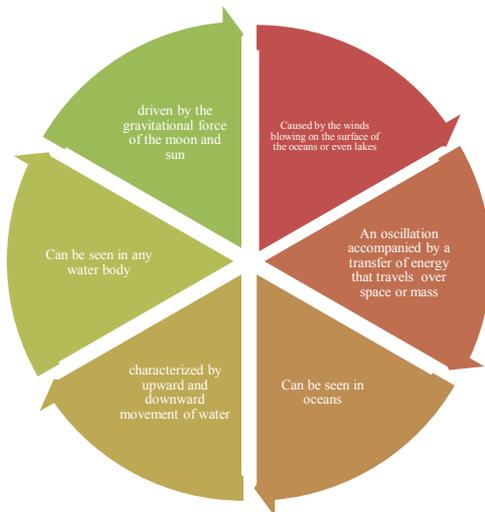
Fill in the blanks with appropriate words.

- a.are produced by winds.
- b. The alternative rise and fall in the level of sea generally takes place.....in a day.
- c. Broader and slower currents are called.....

Answer: a (waves), b (twice), c (drifts)

Question 4

[Analyzing]



The diagram above shows the differences between tides and waves. Study the diagram and fill in the following table:

Tides	Waves

Answer:

Tides	Waves
-Driven by the gravitational force of the moon and sun. -Caused by the winds blowing on the surface of the oceans or even lakes. -Can be seen in oceans. -An oscillation accompanied by the transfer of energy that travels over space or mass.	-Can be seen in any water body. -Characterized by upward and downward movement of water.

Question 5

[Evaluating]

97 % of water on earth is in the oceans. Fresh water sources comprise only 3 %. Do you think the distribution is ideal? Give reasons to support your view.

Answer: **Yes**, oceans provide habitat to a huge number of aquatic species. Sea transport is the cheapest means of transport.

No, the rapid growth of population leads to shortage of fresh drinking water. There are many places where drinking water is already scarce. The problems will become even more inclement with the increase in the number of people.

Question 6

[Creating]

Oceans influence both human and marine lives. The unwise practices such as releasing pollutants into the oceans and over-harvesting upset the marine ecosystem. Design a pamphlet highlighting ways to protect marine ecosystem.

Answer: **Title:** Protection and preservation of marine lives

Objectives: To preserve and promote marine habitats and species.



CHAPTER FIVE- NORTH AMERICA- A GEOGRAPHICAL BACKGROUND.

Learning outcomes

At the end of the lesson, a student should be able to:

5.1. Give a brief description of location, size and political divisions of North America.

Question 1

[Remembering]

North America is the 3rd largest landmass on the earth's surface. The whole of North America lies in the _____ hemisphere.

Answer Northern hemisphere.

Question 2

[Understanding]

The Panama Canal separates North America from South America. What benefits has the construction of the canal brought to the people?

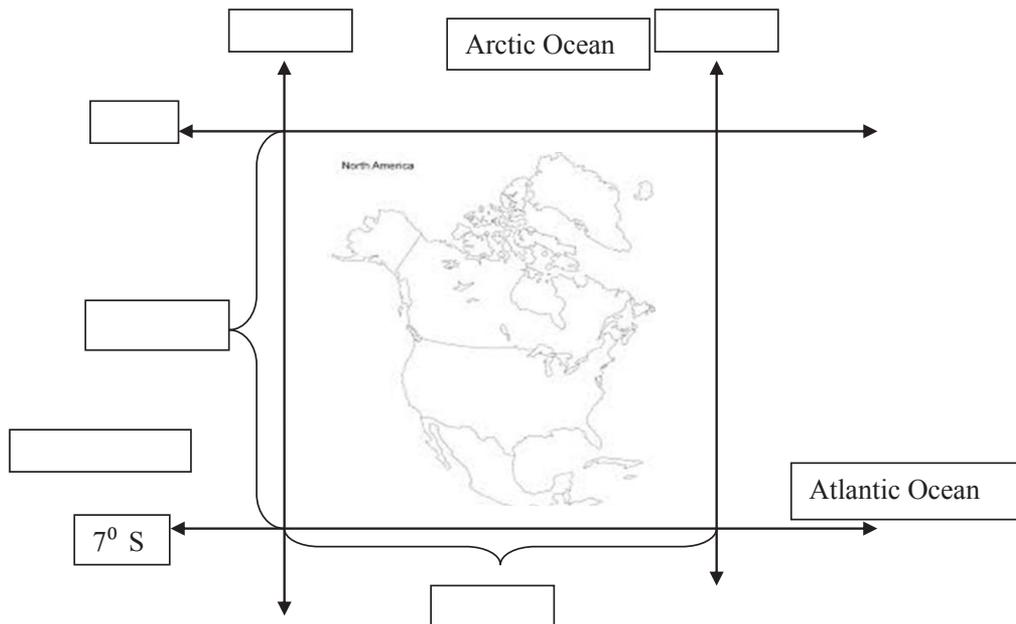
Answer: The Panama Canal connects the Pacific and the Atlantic. It has greatly shortened the distance in sea travel. It has also a tourist attraction.

Question 3

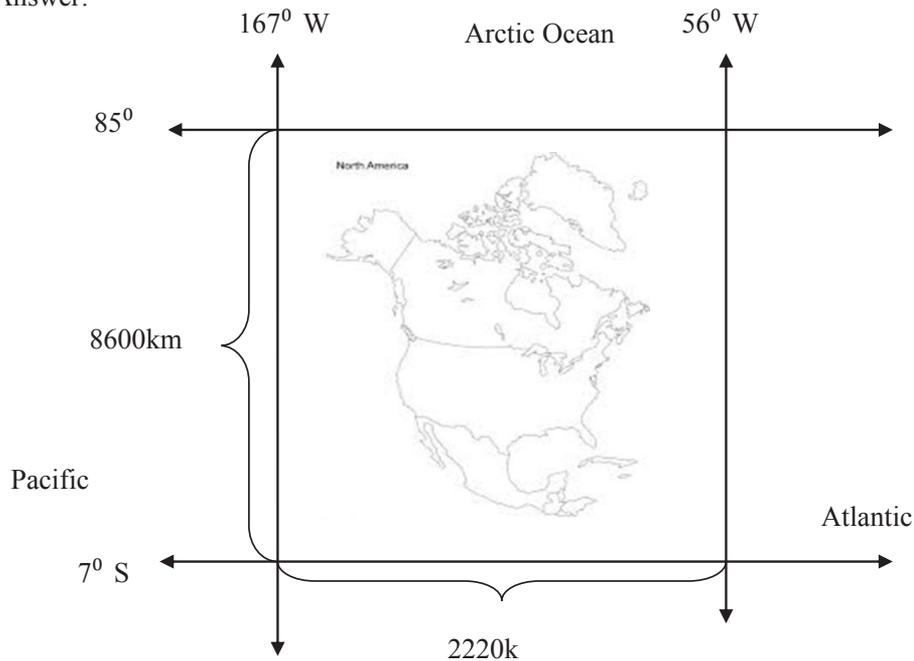
[Applying]

Fill in the empty boxes by choosing the options given below:

2220kms, 56° W, 85°N, 167°W, 8600kms, Pacific Oceans,



Answer:



Question 4

[Analyzing]

Re-arrange the following countries starting from the largest country to the smallest.

Mexico, USA, Panama, Cuba, Canada, Greenland, El Salvador.

Answer.

1. Canada
2. USA
3. Greenland
4. Mexico
5. Cuba
6. Panama
7. El Salvador

Question 5

[Evaluating]

U.S.A is a better country for settlement than Canada. Do you agree? Justify.

Answer. Yes, the U.S. is better country to settle as it is warmer. There is diverse culture. More job opportunities.

No, Canada is better. It has cooler weather conditions. It is less populated. It is more peaceful.

Question 6

[Creating]

You are stranded in Alaska for a week without any basic items required for survival. Develop a survival plan till you are rescued?

Answer Constructing an igloo, hunting, and fishing.

5.2. Describe the physical features of North America.

Question 1

[Remembering]

There are three main physical features of North America. Name them.

Answer The western highlands
 The eastern highlands
 The central lowlands

Question 2

[Understanding]

Appalachian highlands form a chain of mountains belonging to the old-fold category. What features indicate that they are old-fold Mountains?

Answer They are round-topped and are low in height as a result of weathering happening over a considerably long span of time.

Question 3

[Applying]

On the map of North America, shade and label the three main physical features.



Answer



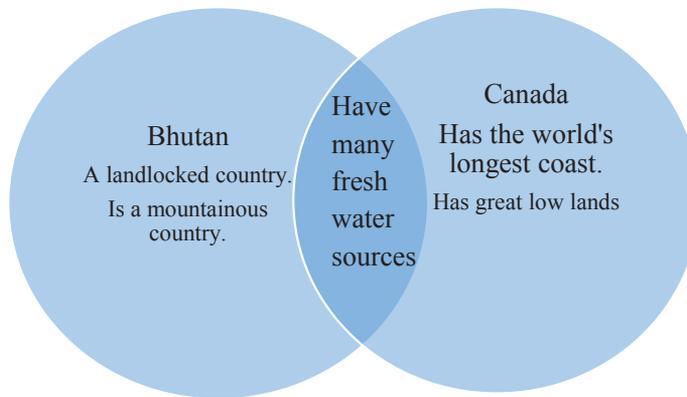
www.worldmapsonline.com

Question 4

[Analyzing]

What are the similarities and differences between Bhutan and Canada with regard to Physical features? Compare using a Venn diagram.

Answer



Question 5

[Evaluating]

During the last ice age, glaciers stripped away all the top soils making the Canadian Shields unfit for human habitation. Do you agree? Why?

Answer

Yes, because the bare rocky and rugged terrain does not encourage agriculture and settlement.

No, although the population of native people in this region is very sparse, the mineral wealth in the area has given rise to temporary settlers.

Question 6

[Creating]

Canadian Shield is known for having rocky rugged plains. Devise a plan to better utilize the bare rocky area.

Answer:

Convert it into rock garden and parks for tourist attraction.

5.3. Discuss the climatic conditions and the types of vegetation found in North America.

Question 1

[Remembering]

There are seven natural vegetation zones in North America. One of the zones is called the Taiga. By what other terms is the region known?

Answer Coniferous forest belt.

Question 2

[Understanding]

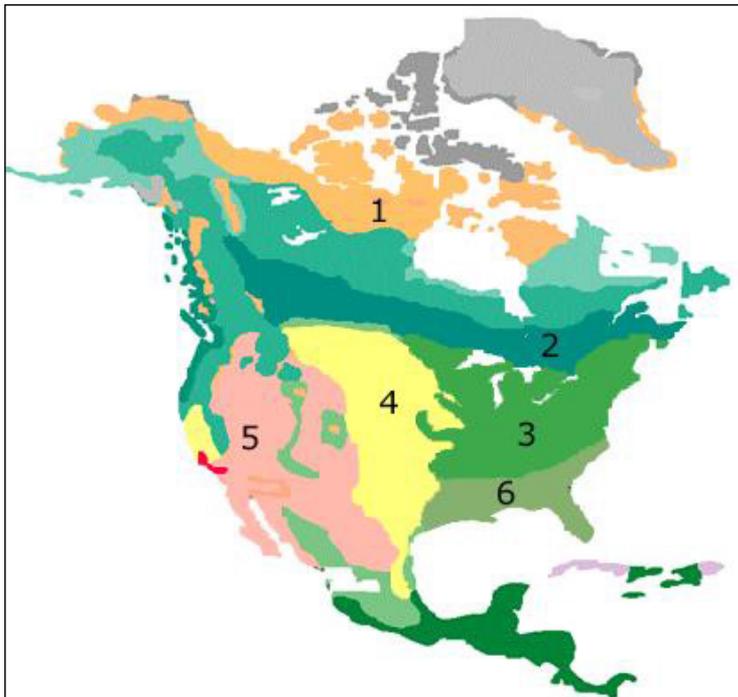
The central lowlands remain deprived of the oceanic influence. Explain why.

Answer: The winds blowing from the oceans are blocked by the mountains. The moist winds blowing from the Atlantic are blocked by the Appalachian Mountains in the east and those blowing from the Pacific are blocked by the Rockies in the west. Therefore, the central plains remain deprived of the moderating influence of the sea.

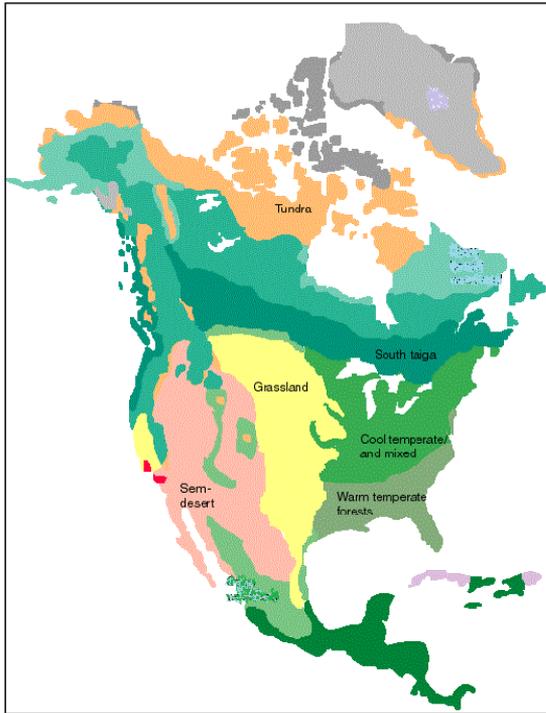
Question 3

[Applying]

On the map of North America, six vegetation zones have been chosen. Name them.



Answer:



www.NAprsnt

Question 4

[Analyzing]

Give your opinion on why the Great Basin and Colorado Plateau receive less rainfall.

Answer: Because these two places are far removed from the oceanic influence. The moisture-laden winds blowing from the ocean become dry as they reach these areas.

Question 5

[Evaluating]

The Tundra region of North America is totally a wasteland. Do you agree? Justify.

Answer **No**, It provides home to many fur bearing animals. During the short summer, the place becomes resplendent with flowers of different colours and many sweet berries. The region also has rich mineral reserves.

Yes, Cultivation of crops is impossible. It is too cold for human habitation.

Question 6

[Creating]

You own a fur farm. To produce a totally new fur colour, what ways will you employ?

Answer Mutation between the animals belonging to same species can produce a new skin colour. Such mutations seldom happen in the wild.

CHAPTER SIX - NORTH AMERICA – THE PEOPLE, NATURAL RESOURCES AND THEIR UTILIZATION

Learning outcomes

At the end of the lesson, a student should be able to:

6.1 Examine the population distribution and ethnic composition of North America.

Question 1

[Remembering]

North America is the third largest continent. The size of the continent is.....

- A 24 million km²
- B 23 million km²
- C 22 million km²
- D 21 million km²

Answer: A 24 million km²

Question 2

[Understanding]

All the following statements about the Tundra region are false EXCEPT:

- A The region filled with grasslands.
- B The growth of trees is hindered by low temperature and short growing season.
- C Densely populated area.
- D A region of beautiful coastlines and harbours.

Answer: The growth of plants is hindered by low temperature and short growing season.

Question 3

[Applying]



The country is thickly populated because of its historical values and favourable climatic conditions. On the map given above shade the country described.

Answer: Mexico



Question 4

[Analyzing]



Given above is the picture of Native Americans. Although they are the original inhabitants, they now comprise a very small part of the population. Explain why?

- Answer:
1. Infectious diseases wiped out half the population of Native Americans.
 2. Many lost their lives while fighting with the European migrants.

Question 5

[Evaluating]

Christopher Columbus discovered North America in 1493. It is the third largest continent in the world and provides home to millions of people. Has his discovery been a boon to the world? Justify.

Answer: **Yes**, some of world’s largest cities have come up in North America. Abundant natural resources and their utilization led to rapid economic development.
No, the Native Americans have lost their position and have become a minority in their own country.

Question 6

[Creating]

North America is a continent composed of several ethnic groups. You are a demographer and you intend to carry out a study on population of North America. Design a survey questionnaire that can help your study.

Answer: Frame questions on the following areas:

1. Name of the ethnic group.
2. Type of language spoken.
3. Type of dress worn.
4. The food habits.

6.2 Discuss the management and utilization of various natural resources in North America

Question 1

[Remembering]

Olives are a unique and useful product of the Mediterranean forests. Margarine and cooking oil are made from them. It is known as the.....of the region.

Answer: cow.

Question 2

[Understanding]

North America has only one-tenth of its total area of land fit for agriculture. Yet, she produces a large amount of surplus products for export. What factors do you think favour the productions?

- Answer:
1. Fertile stone less soil.
 2. Adequate amount of rainfall.
 3. Enough sunshine.
 4. Good farming techniques.
 5. Use of modern technology.
 6. Small population.

Question 3

[Applying]

North America is endowed with a huge range of natural resources. List down some examples of products obtained from the natural resources in the table given below:

Agriculture	Mineral	Forest	Power

Answer:

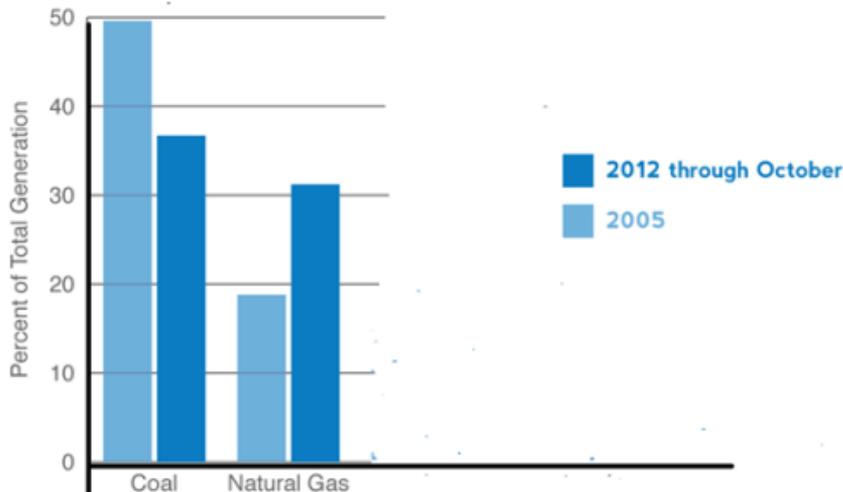
Agriculture	Mineral	Forest	Power
Cornstarch Corn flakes Cooking oil Candy	Coal Iron ore Copper Zinc Petroleum	Wood pulp, paper, plastic, chemicals, furniture and construction materials.	Electricity

Question 4

[Analyzing]

The percentage of electricity generated from coal between t 2005-2012 has decreased? What could have been the possible reasons for the change?

Electric Generation Shares by Fuel Type



Answer: The production of electricity from coal could have decreased over the years because coal is a nonrenewable resource. The supply of coal must have decreased. The use of coal has become unpopular because it pollutes air.

Question 5

[Evaluating]

Forest in North America is largely cleared for cultivation of crops and lumbering. Of the two activities, which one do you think is more advantageous?

Answer: Crop cultivation is more advantageous. Mechanization of farm activities has made work easier and can produce huge amount of crops.

Lumbering is more profitable due to increasing demand for wood and wood products.

6.3 Identify and assess the role played by different modes of transport in North America.

Question 1

[Remembering]

Different means of transports benefit people in various ways. Which of the following means of transport benefit the people by rendering door to door service?

- A Airways
- B Railways
- C Roadways
- D Waterways

Answer: Roadways

Question 2

[Understanding]

Airways are a popular means of transport in North America than in any other continents of the world. Mention TWO advantages of this means of transport.

- Answer:
1. It is the fastest mode of transport.
 2. It causes less pollution.

Question 3

[Applying]

- a. The Panama Canal opened in 1914 iskm long.
- b. On the west, the principal air routes link San Francisco with Singapore via
- c. Chicago is a busy.....terminal at the head of Lake Michigan.

Answer: a (65), b (Honolulu), c (railway).

Question 4

[Analyzing]

Match the items in column A against the items in column B.

Column A	Column B
1.This line connects New York with Sans Francisco via Chicago and Salt Lake city.	a. Lagoons
2.The lakes along the coast of Atlantic ocean and round the Gulf of Mexico.	b. Alaska high way.
3.It operates routes to the USA, the UK and West Indies	c. Union Pacific line
4.It connects Alaska with USA.	d. The Trans Canada Airlines
	d. Soo Canal

Answer: 1c, 2a, 3d, 4b

Question 5

[Evaluating]

North America has all forms of transport. Which one do you think provides better service, road transport or water transport?

- Answer:
- Road transport is better because
1. It provides door-to-door service.
 2. It is faster.
 3. It is affordable and convenient.
- Water transport are better because
1. It is the cheapest mode of transport.
 2. It can accommodate huge number of people.

CHAPTER NINE- EUROPE-PHYSICAL ENVIRONMENT.

Learning outcomes

At the end of the lesson, a student should be able to:

9.1. Give a brief description of location, size and political divisions of Europe.

Question 1

[Remembering]

Given below is the list of some countries of Europe. Which countries are classified under Western Europe?

- France
- Albania
- Portugal
- Norway
- Spain
- Italy
- Finland
- Denmark
- Greece
- Belgium

Answer

France	Albania	Norway	Finland	Denmark	Belgium
--------	---------	--------	---------	---------	---------

Use the map given below to answer question 2.



www.mapsofworld.com

Question 2

[Understanding]

Spain enjoys many advantages owing to its geographical location. List some of them.

Answer Since Spain is a peninsula, it has easy access to sea transport and huge prospects for fishing industry. Moreover, Spain has a Mediterranean type of climate that has facilitated extensive fruit farming.

Question 3

[Applying]

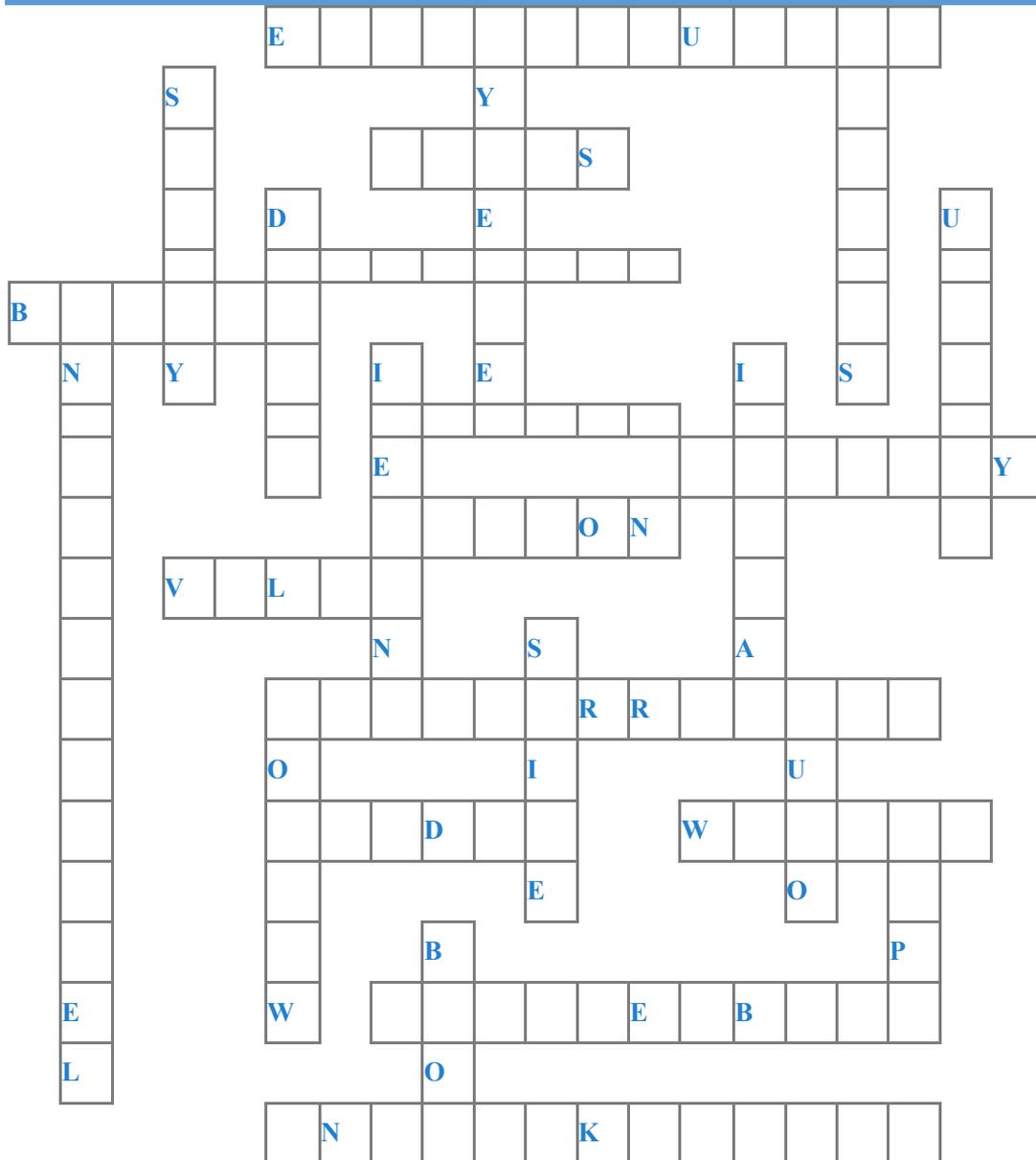
Complete the crossword using the clues given below.

Across

1. A political and economic community of European countries
5. City that has the Eiffel Tower
8. Ocean to the west of Europe
9. Capital city of Germany
13. Largest country in the world that spans from Europe and Asia
14. The country that was once divided by the Berlin Wall
15. The River Thames flows through this city
16. Longest river in Europe
18. Large Sea to the south of Europe
20. The country between Finland and Norway
21. Capital of Poland
24. Highest mountain in Europe
25. The country that includes England, Scotland, Northern Ireland, and Wales

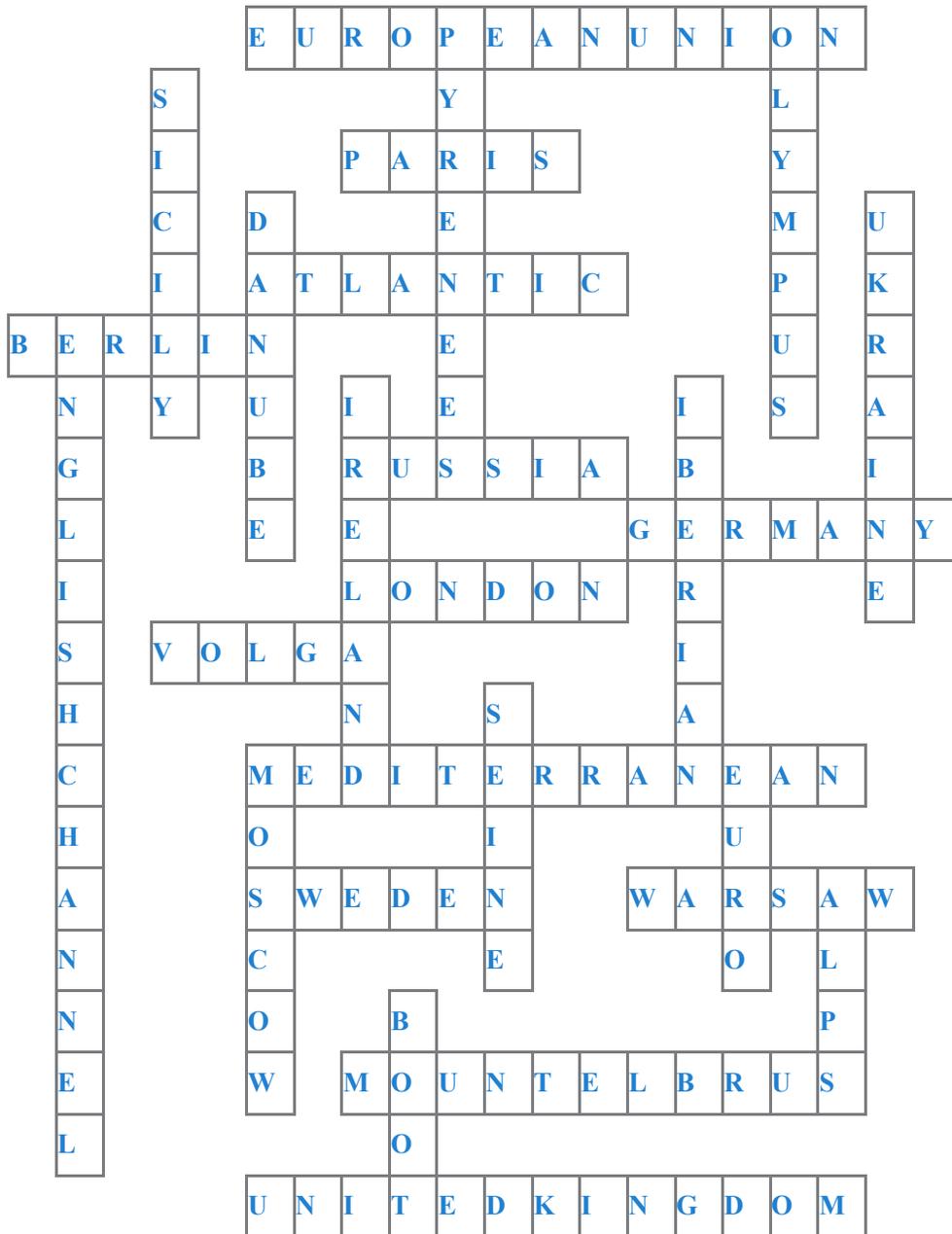
Down

2. Mountains on the border between France and Spain
3. Greek mountains where the gods lived
4. Large island in Southern Italy
6. River that runs through Vienna, Belgrade, and Budapest
7. Kiev is the capital of -----
10. Body of water between England and France
11. The country whose capital is Dublin
12. Spain and Portugal are located on the ___ Peninsula
17. River that flows through Paris, France
18. Capital city of Russia
19. Common currency used in many European countries
22. Mountain range I that runs through Austria, Switzerland, and Northern Italy
23. The country of Italy resembles the shape of a-----



www.ducksters.com/games/crossword_puzzle/europe_geography.php

Answer



Question 4**[Analyzing]**

Europe is a peninsula of many peninsulas. Weigh the advantages and disadvantages of having three sides of land surrounded by oceans.

Answer **Advantages**-fishing industry is a major contributor to their economy. Beaches attract tourist. Easy access to sea transport.
Disadvantages- rise in the level of ocean poses a risk to human settlements.

Question 5**[Evaluating]**

The availability of natural resources in Europe is one of the major contributing factors for its economic development. Do you agree? Why?

Answer **Yes**, use of grasslands for agriculture will reduce the pressure on valuable forest resources.
No, as compared to the other continents, Europe has lesser amount of natural resources. It is mainly because of the proper utilization of the available resources and not the abundance that has contributed to its economic development.

Question 6**[creating]**

Design a map of Europe using different colored cloth pieces to represent different political divisions.

Answer On an outline map of Europe, paste different colored cloth for each country.

9.2. Describe the physical features of Europe.**Question 1****[Remembering]**

The Hercynian Mountains were broken to form Block Mountains and rift valleys as a result of earth's movement. Give two more examples of faulted highlands in Europe.

Answer - Spanish Meseta, the Massif Central.

Question 2**[Understanding]**

List down some evidences which prove that glacier was the most common agent of erosion in Finland in the past.

Answer -Presence of numerous lakes. Existence of land features such as cirques and tarns.
 -Exposed bare rocks.

Question 3**[Applying]**

If you owned a tourist company in Europe, what kind of recreational activities would you introduce to attract tourists in the Alps?

Answer - Mountains skiing, mountain climbing, hiking.

Question 2**[Understanding]**

The Tundra regions have extremely long and cold winter followed by a brief period of slightly warm summers. What factors have led to this type of climate?

Answer.

1. The distance from the equator.
2. Influence of Polar Easterlies.
3. Influence of cold currents of the Arctic Ocean.

Question 3**[Applying]**

The rapid growth of population has led to expansion of towns and cities resulting in the shortage of resources such as water. Suggest some ways through which we can make proper use of rain to alleviate the problems of scarcity of water.

Answer

- Rainwater harvesting.
- Re-cycling of waste water.
- Educating and advertising on the importance of saving water.

Question 4**[Analyzing]**

There are two ways of maintaining forest cover – afforestation and reforestation. Which one do you think is more effective? Why?

Answer

Afforestation is far more effective because even the naturally degraded areas are changed to forested areas again.

Reforestation is not so effective because the saplings planted as replacement for the trees felled take a considerable span of time to fully grow.

Question 5**[Evaluating]**

The conditions in the temperate grasslands of Europe are conducive for agriculture. Do you agree? Justify.

Answer

Yes, the decomposition of grass has added to humus content in the soil making it fertile. The use of grassland for agriculture will also reduce the pressure on valuable forest.

No, the scanty rain here is suited for the growth of grass alone. Without proper irrigation, crops may not grow well.

Question 6**[creating]**

The winter in South East Europe is bitterly cold. The temperature remains below freezing point for the most part. Design a house suited to such weather conditions.

Answer

- The roofing should be done with metal sheets to retain heat.
- Place the chimneys near the roof edge.
- Install solar panels to absorb heats.
- Installing pellet stoves.
- The windows should face the direction of the sun.

CHAPTER 10 – EUROPE –PEOPLE, NATURAL RESOURCES AND THEIR UTILIZATION.

Learning outcomes

At the end of the lesson, a student should be able to:

10.1 Describe the population distribution and ethnic composition of Europe

Question 1

[Remembering]

Europe is inhabited by the people of the White or Indo-European race which are of three groups. They are

- A the Nordic, the Mediterranean and the Alpine people.
- B the Nordics the Mediterranean and the Mangoloid people.
- C the Nordics the Magoloid and Magya's people.
- D the Nordics, the Magyas and Cos.sacks people.

Answer: A the Nordic, the Mediterranean and the Alpine people.

Question 2

[Understanding]

In Europe, the density of population is higher around the coalfields. Why?

Answer: The reasons are:

1. More industries are located.
2. More trade and commerce take place.
3. More job opportunities.

Question 3

[Applying]

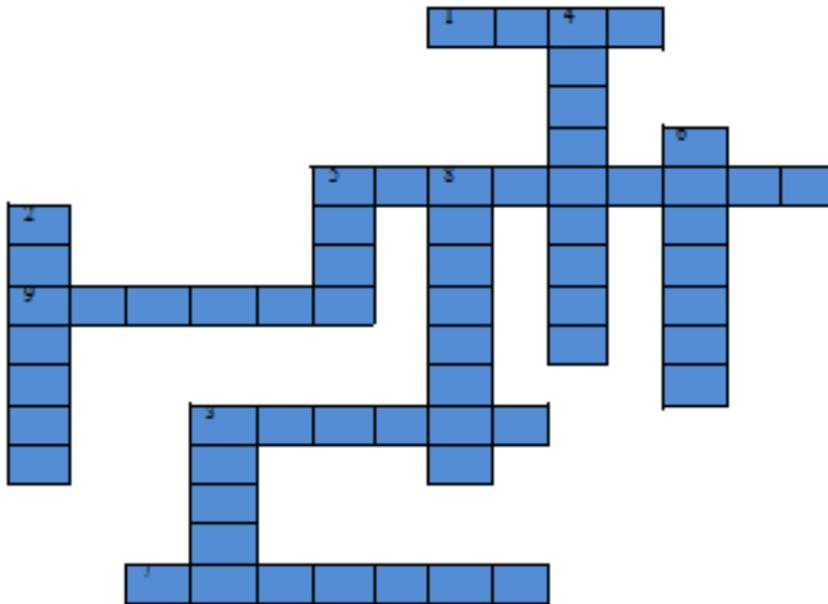
Read the following clues and complete the given crossword puzzle.

Across

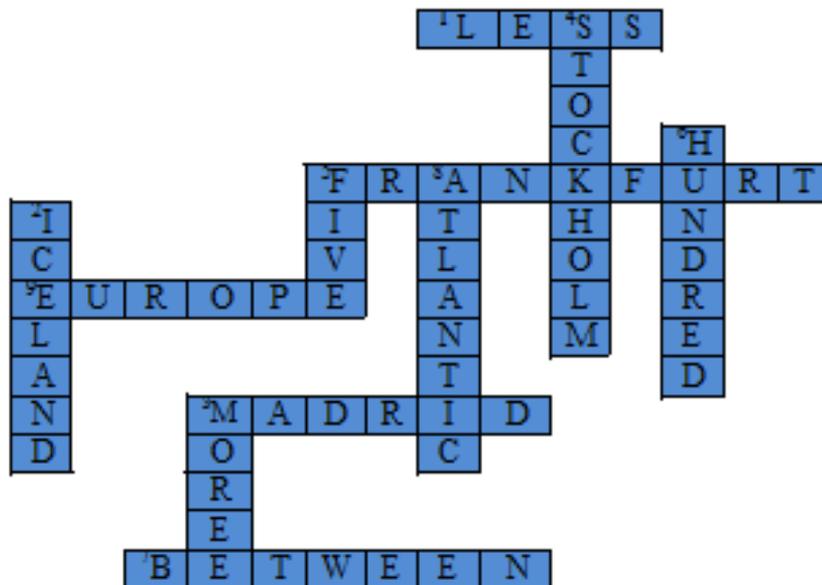
1. The population of St. Petersburg is.....than Berlin.
2. In the centre of Spain is this heavily populated city.
5. A densely populated German city.
7. The population of the western Ireland is.....50 and 100 per square mile.
9. The second smallest continent is.....

Down

2. The island in the northern Atlantic ocean with a small population.
4. A Swedish city that has between 100 and 250 people per square mile.
6. The population of Rome is over one.....people per square km.
8. In France, the density of population is higher along the coast of theocean.
3. The city of Bucharest iscrowded than Athens.



Answer:



Question 3**[Analyzing]**

State TRUE or FALSE. Rewrite the false statements correctly.

1. The people of Northern Europe who are called the Nordics, have paler skin colour, dark coloured hair and eyes and are tall.
2. The Mediterranean's have pale skin colour with dark eyes and hair.
3. The Alpine people have broad flat faces and short heads.

Answer:

1. (False) The people of Northern Europe who are called the Nordics, have paler skin colour, light coloured hair and eyes and are tall.
2. (False) The Mediterranean's and darker skin coloured with dark coloured eyes and hair.
3. (True)

Question 4**[Evaluating]**

Europe has the highest population density in the world. It also has the highest influx of illegal immigrants in the world. Should the immigrants be allowed to settle in Europe? Give reasons to support your answer.

Answer: **Yes.** Immigrants will ease the problem of shortage of labour.

No. Europe is a small continent with a high density of population. It will become overpopulated if the immigrants are allowed to settle.

10.2 Discuss how the natural resources are being utilized in Europe.**Question 1****[Remembering]**

1. The most important resource in Europe is.....
2. Europe harvests over.....million tons of fish annually.

Answer: 1. iron ore
2. 10

Question 2**[Understanding]**

Europe is blessed with a variety of fertile soils and well-watered land. 30% of the population is engaged in some kind of agricultural activity. List down the industries that are directly connected to agriculture.

Answer:

1. Logging and lumbering mills.
2. Paper mills
3. Textile mills
4. Fish processing units
5. Dairy products processing units
6. Flour and sugar mills
7. Fruit canning and processing units.

Question 3**[Analyzing]**

80% of the animals reared in Europe are cattle. Why does cattle rearing receive more importance than other types of farming?

Answer: 18% of Europe's land is devoted to pastures and meadows. They have well distributed rainfall and cool summer in Western Europe ensuring abundant growth of nutritious grasses. They consume lot of dairy products.

Question 4**[Evaluating]**

You have decided to become a farmer after completing your studies and settle in Europe. Of the two activities – livestock rearing and crop cultivation – which activity would you choose? Why?

Answer: Crop farming because I can grow a variety of crops for consumption as well as for commercial purpose.

Livestock because it is easier to rear animals compared to crop cultivation.

10.3. Identity and assess the role played by different modes of transport in Europe.

Question 1**[Remembering]**

The following are the names of major railway junctions in Europe EXCEPT

- A London.
- B Paris.
- C Geneva.
- D Warsaw.

Answer C Geneva.

Question 2**[Understanding]**

There are many peninsulas in Europe which is the main factor that has made water transport possible. Why do you think people prefer inland water transport for bulky and heavy commodities?

Answer -Rivers in Europe are favourable for long distance navigation.
-Inter-basin navigation is facilitated by a highly developed and intricate canal networks.

Question 3**[Applying]**

You are a businessman in Europe and your business demands the use of the most efficient mode of transport. Which one would you choose and why?

Answer:

- Road, because it is quicker and provides door-door service. There is a good network of roads that are usable under all sorts of weather conditions.
- Railways, because it suited for the transport of huge amount of bulky commodities quickly. In Europe, there are railway connections even across the highest mountains.
- Waterways, because it is the cheapest form of transport. Although it takes a longer time to convey the goods, it can manage the largest freight than all the other forms transport.
- Airways, because it is the fastest mode of transport, very widely used in Europe. Although it is expensive, it is well-suited to those people who wish to travel quickly. Europe has some of the busiest airports in the world.

Question 4

[Analyzing]

Match each item in column A against the correct item in column B. Rewrite the matching pairs.

A	B
1. Airways	a. Fast mode of transport for conveying huge amount of goods although not suited for mountainous terrain.
2. Waterways	b. Provides door-door service and radiates outwards in all directions from major cities.
3. Roadways	c. Cheapest form of transport for bulky commodities.
4. Railways	d. Fastest mode of transport and connects all the important cities.
	e. The mode of transport that cannot be used in the remote areas.

Answer 1.(d) 2.(c) 3.(b) 4.(a)

Question 5

[Evaluating]

Europe is one of the best developed continents in the world because everything is available within the continent. Do you agree? Justify.

Answer **Yes**, because Europe is highly developed in terms of science and technology with many industries which supply a wide range of goods and services the people demand.

No, although the Europeans have better technical know-how, there is still a shortage of foodstuff. They import huge amount of food materials from other continents. There is also an acute shortage of raw materials like iron ore, cotton and petroleum products.

10.4 State the importance of trade in Europe.

Question 6

[Creating]

If you were the president of EEC, what revolutionary changes you would bring in European trade?

