Local Time And Standard Time

Exercise

Q. 1. A. Complete the sentence by selecting the correct option:

The earth requires 24 hours for one rotation. In one hour,
A. 5 longitudes will face the sun

B. 10 longitudes will face the sun
C. 15 longitudes will face the sun
D. 20 longitudes will face the sun

Answer : Longitude is the angular distance of a place east or west of the meridian at Greenwich, England. It is represented in degrees.

One rotation = 360^{o}

The time required for the earth to complete one rotation = 24 hours

Therefore, longitudes covered in one hour = 360/24 = 15°

Q. 1. B. Complete the sentence by selecting the correct option:

To calculate the difference between the local times of any two places on the earth,
A. the noon time at both the places should be known

B. the difference in degrees of their longitudes should be known
C. the difference in standard times of both the places should be known
D. Changes need to be made according to International Date Line

Answer : Local time is the time in a particular region or country. Longitude is the angular distance of a place east or west of the meridian at Greenwich, England. Each region has a particular longitude and latitude. Since, the earth rotates from west to east, the local time changes with respect to longitude. Thus, any difference between the local times of any two places on the earth can be determined by finding the difference in degrees of their longitudes.

Q. 1. C. Complete the sentence by selecting the correct option:

The difference between the local time of any two consecutive longitudes is
A. 15 minutes
B. 04 minutes
C. 30 minutes
D. 60 minutes

Answer : Longitude is the angular distance of a place east or west of the meridian at Greenwich, England. It is represented in degrees.

One rotation = 360^o

The time required for the earth to complete one rotation or 360^o = 24 hours

The difference in degrees between any two consecutive longitudes is 1^o

Thus, the difference between the local time of any two consecutive longitudes = 24/360 hours = 0.066 hour

1 hour = 60 mins

⇒ 0.066 hour = 4 mins

Q. 2. A. Give geographical reasons:

The local time is decided by the noon time.

Answer : Local time is the time in a particular region or country. It is determined on the basis of the apparent movement of the sun. When the sun is exactly over the head, it is noon at that place. The length of the shadow is shortest at noon. The local time of each longitude differs from other. Thus, noon occurs at different times in different longitudes.

Q. 2. B. Give geographical reasons:

The local time at Greenwich is considered to be the international standard time.

Answer : Local time is the time in a particular region or country. It is determined on the basis of the apparent movement of the sun. It is same for a region or country located on the same latitude. However, countries located in different longitudes have different local times. Thus, for an international coordination between countries, the local time at Greenwich (Greenwich Mean Time) in England is considered to be the international standard time. The standard times of various countries are calculated with reference to GMT by calculating the longitudinal difference.

For instance, if it is noon at Greenwich, the Indian standard time would be 5:30 PM

Longitudinal coordinates of Greenwich = 0

Longitudinal coordinates of India = $82^o30'E$

Longitudinal difference = $82^o30'E$

Time taken to cover one longitudinal degree = 4 minutes

Standard time of India = GMT + (82.5) *4 minutes = GMT + 330 minutes = GMT + 5:30 hours

Q. 2. C. Give geographical reasons:

The standard time of India has been decided by the local time at 82.5° E longitude.

Answer : Local time of any place is determined by its longitudinal location. India's longitudinal extent varies from 68°7'E to 97°25'E. It will be cumbersome to have local time based on each longitudinal degree. Thus, to avoid the problems of poor coordination and to maintain uniformity, a standard longitudinal of 82°30'E was taken as a reference to determine the standard time of India. This longitude passes through the middle of the country with reference to its longitudinal extent. When the sun is directly overhead on this longitude, then it is assumed that it is 12 noon everywhere in India.

Q. 2. D. Give geographical reasons:

Canada has 6 different standard times.

Answer : Canada is one of the biggest countries in the world. It ranges from 52° W to 141° W. Thus, the local time in the east is nearly 6 hours ahead of the west. If Canada had selected a time single time zone, then both east and west Canada would be offset from local time by 3 hours. Then, eastern Canada would experience noon by 9:00 AM and 3:00 PM in western Canada. Thus, Canada has gone for multiple time zones. From west to east the time zones are Pacific, Mountain, Central, Eastern, Atlantic, and Newfoundland.

Q. 3. A. Answer in brief:

If it is 12 noon at 60°E longitude, then explain what would be the time at 30° W longitude?

Answer : Local time of any place is determined by its longitudinal location. The time at 30° W longitude can be determined with reference to know the time at any given longitudinal location.

the difference in the longitudinal stretch with known reference = 60°E - 30°W =90°

Time is taken to travel longitudinal degree = 4 minutes

Time taken for 90° = 90*4 = 360 minutes = 6 hours

Thus, if it is 12 noon at 60°E longitude, then time at 30° W longitude would be 6 AM.

Q. 3. B. Answer in brief:

How is the standard time of a place determined?

Answer : Local time of any place is determined by its longitudinal location. It varies with different longitudes. As a result, many places within a country can have multiple local times. This could disrupt the coordination in the routine activities in the country. Thus, the local time of a longitude passing through the middle of the country is taken as the standard time for that country. This standard time is used all over the country. Usually, a single standard time is used if the difference between the longitudinal extent of the country is less than 1 or 2 hours, otherwise, multiple standard times are used. For example, Canada has 6 time zones.

At the global level, the world has been divided into 24 time zones. These time zones have been created with reference to the Prime Meridian itself. Thus, the standard time of any country is expressed in terms of GMT.

c) A football match being played at Sao Paulo, Brazil started in India at 6 am IST. Explain what would be the local time at Sao Paulo?

Local time of any place is determined by its longitudinal location. There is a wide longitudinal extent between Brazil and India. Thus, local times of both countries would vary to a large extent.

Longitudinal location of Sao Paulo, Brazil = 46°38'W

India’s standard longitudinal location = 82^{o}30’E

Longitudinal Difference = 82^{o}30’E - 46°38'W = 129.13°

Time difference = 129.13° *4 minutes = 516.53 minutes = 8.60 hours

Thus, local time at Sao Paulo, Brazil = 9:24 PM of previous day.

Q. 4. If it is 10 pm on 21st June at Prime Meridian, write the dates and time at A, B, and C in the table.

Place	Longitude	Date	Time
A	120° E	**22 June**	**6:00 AM**
B	160° W	**21 June**	**11:20 AM**
C	60° E	**22 June**	**2:00 AM**

Answer : Date changes post 12:00 AM

Earth rotates from west to east

Earth takes one hour to complete 15°

GMT = 10:00 PM, 21st June

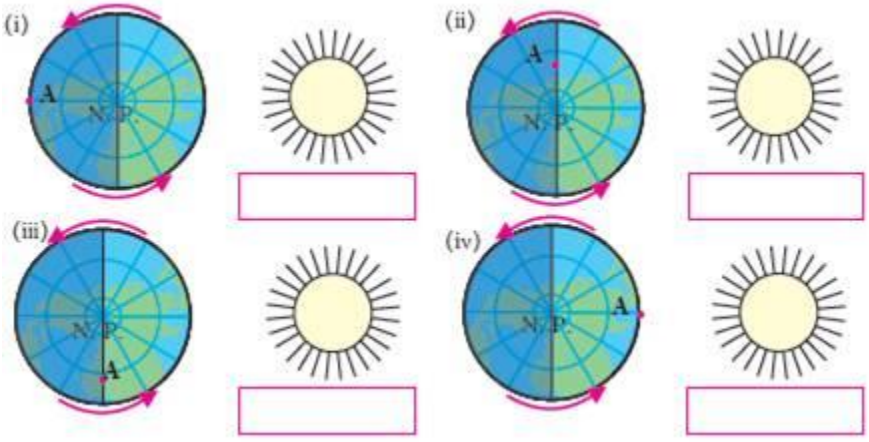
Place A: time difference = GMT + (120° E/15) = GMT + 8 hours

Place B: time difference = GMT - (160° W /15) = GMT – 10.6 hours

Place C: time difference = GMT + (60° E /15) = GMT + 4 hours

Q. 5. Write the situations of place A shown in these diagrams in the boxes below them:

(i) Sunrise (ii) midnight (iii) noon (iv) Sunset



Answer :

i. Midnight. Point A lies in the shadow region. Also, it is located diametrically opposite to the position of noon. Hence, Midnight

ii. Sunset. Point A is about to enter into the shadow region, as indicated from the direction of rotation (counter-clockwise). Hence, Sunset

iii. Sunrise. Point A is about to enter into the sunlight region, as indicated from the direction of rotation (clockwise). Hence, Sunrise

iv. Noon. Point A lies in the sunlight region. Also, the sun is exactly over the head of point A. Hence, Noon.

Activity

Q. 1. A. Look for the actual granny's clock in Shri Acharya Atre's poem: "Aajiche Ghadyal" (granny's clock). Look for this poem on the internet or in reference books.

Answer : आजीचे घडयाळ

आजीच्या जवळी घडयाळ कसले आहे चमत्कारिक,

देई ठेवुनि तें कुठे अजुनि हे नाही कुणा ठाऊक;

त्याची टिक टिक चालते न कधिही,आहे मुके वाटते,

किल्ली देई न त्यास ती कधि,तरी ते सारखे चालते

"अभ्यासास उठीव आज मजला आजी पहाटे तरी",

जेव्हा मी तिज सांगुनी निजतसे रात्री बिछान्यावरी

साडेपाचही वाजतात न कुठे तो हाक ये नेमकी

"बाळा झांजर जाहले, अरवला तो कोंबडा,ऊठ की !"

ताईची करण्यास जम्मत, तसे बाबूसवे भांडता

जाई संपुनियां सकाळ न मुळी पत्त कधी लागता !

“आली ओटीवरी उन्हे बघ!” म्हणे आजी,”दहा वाजले !

जा जा लौकर !” कानि तो घणघणा घंटाध्वनी आदळे.

खेळाच्या अगदी भरांत गढुनी जाता अम्ही अंगणी

हो केव्हा तिनिसांज ते न समजे ! आजी परी आंतुनी

बोले, “खेळ पुरे, घरांत परता ! झाली दिवेलागण,

ओळीने बसुनी म्हणा परवचा ओटीवरी येउन !”

आजीला बिलगून ऎकत बसू जेव्हा भुतांच्या कथा

जाई झोप उडून, रात्र किती हो ध्यानी न ये ऎकता !

“अर्धी रात्र कि रे” म्हणे उलटली,”गोष्टी पुरे ! जा पडा !”

लागे तो धिडधांग पर्वतिवरी वाजावया चौघडा

सांगे वेळ,तशाच वार–तिथीही आजी घडयाळातुनी

थंडी पाऊस ऊनही कळतसे सारें तिला त्यांतुनी

मौजेचे असले घड्याळ दडुनी कोठे तिने ठेविले?

गाठोडे फडताळ शोधुनि तिचे आलो ! तरी ना मिळे !

Q. 1. B. Find out the velocity of the earth’s rotation in km/ hour.

Answer : Earth’s circumference = 40,075 km

Time taken for earth to complete one rotation = 24 hours

Thus, velocity of the earth’s rotation in km/ hour = 1669.79 km/hour.

Intext Questions

Q. 1. Why does the duration of day and night keep changing?

Answer : The duration of day and night changes due to the rotation of the earth. The earth takes 24 hours or one day to complete one rotation. The sun rises in the east, and the movement of the earth is from west to east. Hence we experience changes in day and night and other phenomena of sunset, sunrise and midnight.

Q. 2. How many longitudes can be drawn on a world map keeping an interval of 1° each?

Answer : In total there can be 360 longitudinal degrees possible. This is because of the shape of our earth which is quite a circle and in a circle, there are 360 degrees. But when we flatten out the map to a piece of paper, we add the fence post problem. Now there are 361 longitude lines on the paper, but two of them are the same line, the 180-degree line which would appear on each side of the map. Hence there are 360 longitudinal lines.

Q. 3. The apparent movement of the sun from east to west is a result of what?

Answer : This is due to the law of inertia. The earth is considered to be moving from west to east. When we see celestial bodies moving from within a planet already moving, the law of inertia comes to play. Hence we see those bodies moving from east to west. The apparent movement of the sun from east to west is also a result of the same.

Q. 4. What is the direction of the rotation of the earth?

Answer : The movement of the earth is considered to be from east to west. As viewed from the North Pole star Polaris, the earth turns counter clockwise. Hence it is observed that it rotates from east to west.

Q. 5. While the earth rotates, how many longitudes face the sun daily?

Answer : Every longitude on the earth will face the sun at some point. It is due to the rotation of the earth. In any event, all the lines of longitude will face the sun every 24 hours. When the earth rotates and completes a rotation, every twenty-four hours each and every longitude once faces the sun.

Q. 6. At which longitude does the date change?

Answer : Date changes by means of International Date Line as an imaginary line of demarcation that runs from the North Pole to the South Pole. International Date Line was established in 1884 and passes through the mid-Pacific ocean roughly follows a 180 degrees longitude north-south line on the earth.

Q. 7. How was time measured in olden days?

Answer : Time was measured with the help of various tools and depended on natural events for the measurement of time in olden ways. Instruments like Ghatikapaatra (a

bowl with a minute hole at its base which would float in a large water-filled vessel), sand timer, sundials, etc. were used by people in ancient times. A whole day meant the duration from one sunrise to the next.

Q. 8. In present times, what are the instruments used for time measurement?

Answer : In present times clocks and watches are used as instruments for time measurements. Also, gadgets like mobile phones, laptop, computer, digital clocks, etc. are also used. For a very accurate time measurement atomic clocks are also used in present times.

Q. 9. At the poles, sunrise occurs on one equinox and sunsets on the next equinox. If you happen to be at any of the poles during this time, then what would be the route of the sun in the daytime?

Answer : Right from the day equinox occurs, constant day and night conditions begin in poles. If one happens to be at the North Pole during an equinox at the time of sunrise, then the route of the sun is negligible. There are no directions. The sun appears above the horizon in summer and makes a 360-degree circle in the sky over a period of 187 days at the North Pole 90 degree north latitude, and in winter the sun is below the horizon for 163 days of darkness and 24 days of semi-darkness when the sun is just below the horizon. The same is the situation on the South Pole which faces darkness when there is sunrise at the North Pole.

Q. 10. On which day would the sun appear at the highest point in the sky?

Answer : During solstice, the tilt of the earth's axis is pointed most directly towards or away from the sun. The summer solstice for the northern hemisphere occurs within a few days of June 21 every year. It is on this day that the position of the sun in the sky at noon is at its highest altitude of the year. The position of the sun at the sunrise and sunset is farthest on this day. Hence on 21 June, the sun appears at the highest in the sky.

Q. 11. We have studied that the local time is different in different parts of the world. The daily routine of the people there is determined according to the local time in those places. Figure 1.3 shows the local times of different longitudes. Study this map and answer the following questions. Use the relationship between degrees and time for this.

A) Between which longitudes do the region experience daytime?

B) Which longitudes experience noon and midnight respectively?

C) Edward from New Orleans is on which longitude?

D) What is the time at Accra city?

E) At the same time, what is Sharad from Patna and Yakaito from Japan doing? What time is it in these cities?

F) Select any one longitude. Calculate the local time of the longitudes lying 1° to the west and east of this longitude.

Answer : A) The region which experiences daytime lies between the longitude 90-degrees East and 90-degrees West.

B) The longitude which experiences noon is the zero degrees longitude which is also called Greenwich Mean Time and the longitude which experiences midnight is 180 degrees east or west longitude. (180 degrees east and 180 degrees west are the same).

C) Edward from New Orleans is located on longitude 90 degrees 04'west in the United States.

D) Accra city is located at latitude 5.55 degree and longitude -0.19 in the northern hemisphere as shown in the map. Hence the time is 12 noon.

E) At the same time Sharad from Patna is going to school as it is early in the morning and Yakaito from Japan is preparing her bed as she is going to bed for sleep because it is night there.

F) Let the selected longitude be 30 degrees. The time at this longitude is two p.m. that is it is the daytime. The difference between two consecutive longitudes is 4 minutes.

So the longitude lying 1 degree east to the 30-degrees longitude is 31-degrees longitude. The time at this longitude will be

2:00 p.m. + 4 minutes (as the difference between two consecutive longitudes is of 4 minutes) = 2:04 p.m.

Similarly, the longitude lying 1 degree west to the 30-degrees longitude is 29-degrees west longitude and the time is calculated as

2:00 p.m. – 4 minutes which would be equal to 1:56 p.m. or 13:56 hours according to the hours of the day.

Q. 12. What is the maximum number of local times that can there be in the world?

Answer : Currently there are 38 different local times in use around the world. Including its overseas territories, France uses ten different time zones, the most of any country.

Q. 13. How many longitudes pass the sun in one hour?

Answer : 15 degree of longitude passes under the sun every hour. By dividing 360 by 24 the answer we get is fifteen degree, in other words, the sun appears to move at a speed of 15 degrees per hour. The change is hardly noticeable in multiple human lifetimes however everything counts in large number.

Q. 14. Look for the map of world time zones from reference books and see in which time zone India falls into?

Answer : There are several time zones in the world. India falls into time zone known as Indian Standard Time (IST) currently. It is five and a half hour ahead of Greenwich Mean Time.

Q. 15. Mumbai is located at 73° E longitude. Kolkata is located at 88° E longitude. Find the difference between the longitudes of these two cities.

Answer : The difference between the two longitudes of Kolkata and Mumbai is 15 degrees. This is calculated as:

Longitude of Kolkata – longitude of Mumbai

As Mumbai is located at 73-degree longitude and Kolkata is located at 88-degree longitude the calculation will be as follows:

Which is, 88 degrees – 73 degrees = 15 degrees.

Q. 16. If the local time at Mumbai is 3 pm then what would be the local time at Kolkata?

Answer : If the local time at Mumbai is 3 p.m. then the time in Kolkata would be 4: 02 p.m. The difference is approximate of an hour and exactly two more minutes. This is calculated using the difference between their longitudes. Mumbai is 72 degree 50'E and Kolkata is 88 degrees 23'E. So the difference between them is 15.5 degree.

As

1 degree equals to 4 minutes. This means that for each degree of longitude, the local time differs by 4 minutes.

Therefore, converting 15.5 degrees into minutes, we get 62 minutes

Which is two minutes more than an hour.

Adding 62 minutes into 3 p.m., we get 4: 02 p.m.

Q. 17. Look at figure 1.4 and answer the following questions:

Considering the longitudinal extent of India, how many longitudes with a difference of 1° can be drawn on the map?

Answer : The longitudinal extent of India is 68 degrees 7'E and 97 degrees 25'E. Considering the longitudinal extent of India 28 Longitudes can be drawn on the map of India.

Q. 18. Look at figure 1.4 and answer the following questions:

By how many minutes do two consecutive longitudes differ?

Answer : The difference between two consecutive longitudes is of 1 degree, and one degree is equal to 4 minutes. Hence the difference between any two consecutive longitudes is for four minutes.

Q. 19. Look at figure 1.4 and answer the following questions:

What is the value of degrees of longitude at Mirzapur?

Answer : The value of degrees of longitude at Mirzapur is 82 degree 30 East. The Indian Standard Time is calculated on the basis of this longitude only in Mirzapur, Uttar Pradesh which is nearly on the corresponding longitude reference line.

Q. 20. Look at figure 1.4 and answer the following questions:

If it is 8 a.m. at 82° 30' E, what would be the time in their clocks at the following places?

- **Jammu**
- **Madurai**
- **Jaisalmer**
- **Guwahati**

Answer : The time will remain the same everywhere because there is only one -time zone across the whole of India. The time zone is calculated according to the longitude of 82.5 degrees E. at Shankar garh Fort in Mirzapur (in Allahabad district of Uttar Pradesh) which was picked as the central meridian for India.

Q. 21. Look at figure 1.4 and answer the following questions:

Though the distance between them is more why doesn't the standard time differ in these places?

Answer : This is because of the adoption of the central meridian of India located in Mirzapur. The time zones were officially established in 1884 during the British Rule. Indian Standard Time was introduced on January 1, 1906. According to this timezone,

all the activities official or unofficial take place. The government chooses to keep a single time zone across the whole country despite various requests and proposals to change it.

Q. 22. If it is 8 a.m. in India, what is the time in Greenwich?

Answer : India is five and a half hours ahead of Greenwich Mean Time. So if it is 8 a.m. in India, then it would be 2:30 p.m. in Greenwich which is calculated by adding five and a half hour to Greenwich Mean Time.

Q. 23. When it is 2 p.m. in India, in which countries would it be 2 p.m. too?

Answer : The countries which use the same longitude to calculate their mean time would follow the same time zone and have equal time to that of India. There is no other country which uses the same longitude to measure the time. Hence when it is 2 p.m. in India, there is no other country in which it would be 2 p.m.

Q. 24. When it is 9 a.m. in India, what would be the time at 82° 30' W longitude?

Answer : The places which are located on 82 degrees 30'W longitude are Southampton Island, Canada, United States, Cuba, and Panama. The time when it is 9 a.m. in India in these countries will be 10:30 p.m.

Q. 25. What would be the time at Prime Meridian when a new day starts at 180° longitude?

Answer : When a new day starts at 180-degree longitude the time at the prime meridian will obviously be noon. It is 12 hours earlier when a new day starts at the International Date Line.

It's 00:00 on the Date Line. There are 24 hours in a day. On the prime meridian which is half the world away the time would be 24 divided by half which will come equally to 12.

Hence 12:00 would be the time on the Prime Meridian.

Q. 26. In which of the following countries, does only one standard time exist?

- **Mexico**
- **Sri Lanka**
- **New Zealand**
- **China**

Answer : From the following countries China is the country which has only one standard time zone which is followed by easternmost China and westernmost China. This was the Communist Party decision to use Beijing time across the country to

enhance national unity. From most people in China, the single time zone is at most mild inconvenience a scheduling quirk that simply requires a little adjustment.

Q. 27. Why does a country having a large latitudinal extent have only one standard time?

Answer : A country of large latitudinal extent should have only one standard time because there should be no confusion of time, so the standard time is taken from a particular place for a whole country. If the country does not have a standard time, all the functions will take place at the different time which might lead to a hectic schedule. It is difficult to rule with two or more times. This type of variations can cause several differences in official and another job which are depending on proper time accuracy. For example, in Russia, there are eleven-time zone so a person standing at one end will have to call in the night to reach another end in midday

That’s why these countries follow an average standard time of all time ranges to avoid any time-related confusions.

Interior Of the Earth

Exercise

Q. 1. A. Tick (√) the correct options in the box

There are two layers in the crust.

A. Inner and outer crust

B. Continental and oceanic crust

C. Surface and oceanic crust

D. Mantle and Core

Answer : The crust is the outermost layer of the earth's surface. It exists in a solid state. It is classified into two layers based on chemical composition. The continental crust is made up of silica and aluminium, whereas, the oceanic crust is made up of silica and magnesium.

Q. 1. B. Tick (√) the correct options in the box

Which element is found in both mantle and crust?

A. Silica

B. Magnesium

C. Aluminium

D. Iron

Answer : Silica is the most abundant material found in both crust and mantle.

Mass percentage of silica in Crust = 60.6%

Mass percentage of silica in Mantle = 44.71%

Q. 1. C. Tick (√) the correct options in the box

Which of these minerals are found in the core of the earth?

A. Iron-magnesium

B. Magnesium-nickel

C. Aluminium- Iron

D. Iron-nickel

Answer : The Core is the innermost layer of the earth. Iron and Nickel are the predominant materials found in this layer.

Q. 1. D. Tick (√) the correct options in the box

The inner core is in which state?

A. Gaseous

B. Solid state

C. Semi-solid state

Answer : The Core is the innermost layer of the earth. It consists of 2 parts – inner core and outer core. The inner core is in solid state and outer core is in liquid state.

Q. 1. E. Tick (√) the correct options in the box

The outer core is made up of

A. Iron

B. Gold

C. Hydrogen

D. Oxygen

Answer : The Core is the innermost layer of the earth. It consists of 2 parts – inner core and outer core. Outer core mainly consists of Iron. Liquid iron in the outer core is also responsible for the generation of magnetic field. North and South Poles exist because of the liquid outer core.

Q. 1. F. Tick (√) the correct options in the box

The layer of the earth on which we live.

A. Mantle

B. Core

C. Crust

D. Continental crust

Answer : Earth's interior is classified into many layers. The crust is the outermost layer of the earth's surface. The crust is divided into continental crust and oceanic crust. Thus, the layer in which we live is continental crust and the remaining is oceanic crust.

Q. 1. G. Tick (√) the correct options in the box

Which seismic waves can travel through liquid medium?

A. Primary waves

B. Secondary Waves

C. Surface waves

D. Oceanic waves

Answer : Seismic waves are the waves of energy caused by the sudden breaking of rock within the earth. Seismic waves can be classified into body waves and surface waves. Body waves can be further classified into primary waves and secondary waves. Primary waves can travel through any medium, whereas, secondary waves pass through solid medium only.

Q. 2. A. Tell whether right or wrong. Correct the wrong statement

The density of various materials is not the same in the interior of the earth.

Answer : True

Density of various materials differs in the interior of the earth. The core is denser than mantle and crust.

Q. 2. B. Tell whether right or wrong. Correct the wrong statement

The core of the earth's interior is made up of hard rock

Answer : False

The outer core is made up of a liquid state and inner core is made up of solid state.

Q. 2. C. Tell whether right or wrong. Correct the wrong statement

Secondary waves cannot pass through outer core.

Answer : True

Secondary waves are a type of seismic waves. They can travel through solid medium only. The outer core is made up of liquid state. Hence, secondary waves cannot pass through outer core.

Q. 2. D. Tell whether right or wrong. Correct the wrong statement

Continental crust is made up of silica and magnesium

Answer : False

The continental crust is made up of silica and aluminium. Oceanic crust is made up of silica and magnesium.

Q. 3. A. Answer the following

What are the two parts of the crust? What is the basis of classification?

Answer : Earth's crust is the outermost layer. It can be classified into Continental crust and oceanic crust, on the basis of chemical composition. The continental crust is made up of silica and aluminium. Oceanic crust is made up of silica and magnesium.

Q. 3. B. Answer the following

Why is the upper mantle called the asthenosphere?

Answer : The Mantle is the layer beneath the earth's crust. It consists of two layers: upper and lower mantle. The upper mantle is called asthenosphere, "astheno" is a Greek word meaning 'weak'. It is called weak layer because it is in liquid state where rock material deforms more readily, and magma formation takes place.

Q. 3. C. Answer the following

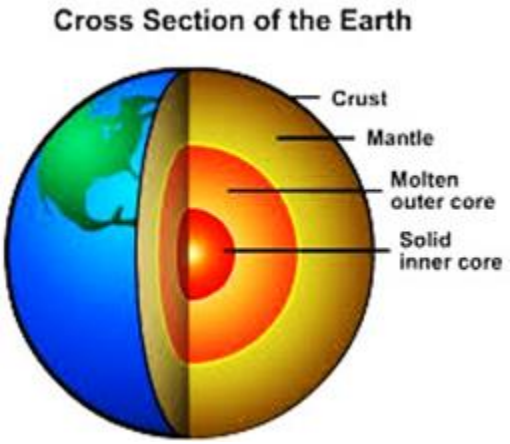
Magnetosphere of the earth is a result of rotation. Explain.

Answer : The magnetosphere is the region of space surrounding earth where the dominant magnetic field is the magnetic field of Earth, rather than the magnetic field of interplanetary space. Earth's magnetic field is developed due to a phenomenon called dynamo effect. It means the generation of a magnetic field due to rotating current. This electric current is a result of the spiral eddies generated due to earth's rotation and vertical currents formed due to the temperature difference between the outer core and inner core.

Q. 4. A. Draw neat diagrams, label them and explain.

The interior of the earth.

Answer :



Earth’s interior is classified into different layers.

The crust is the outermost layer of the earth’s surface. It is divided into continental crust and oceanic crust. It exists in a solid state. The continental crust is made up of silica and aluminium, whereas, the oceanic crust is made up of silica and magnesium. It is the thinnest of all layers when compared to mantle and core. The thickness of the crust varies. Continental crust is thicker than oceanic crust. The crust comprises large plates of land called tectonic plates. The movement and interaction of these tectonic plates are responsible for mountain formation, fertile plains, volcanic eruptions etc.

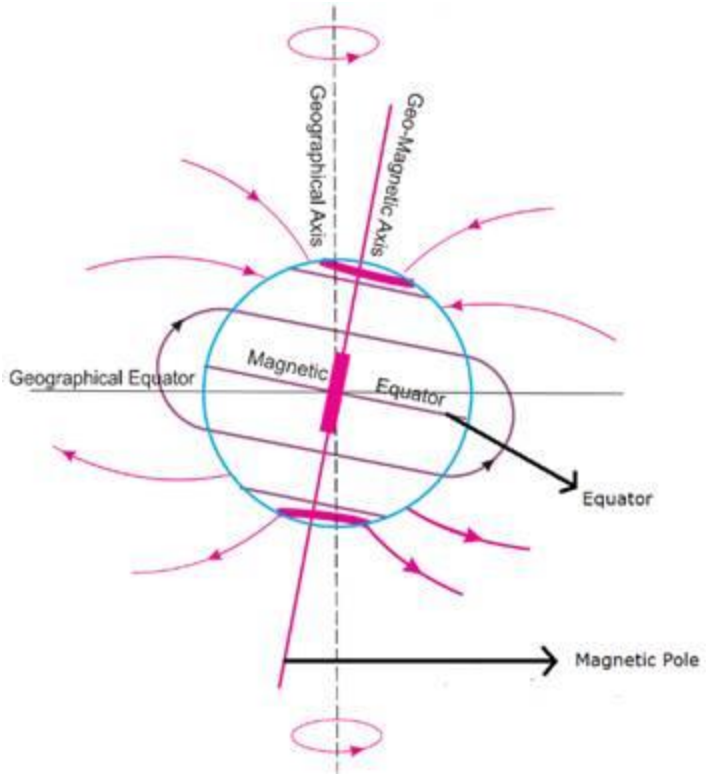
The mantle is the layer beneath the earth’s crust. It is the biggest part of the Earth comprising more than 85% of the Earth's mass. The upper mantle is in a liquid state. It is extremely hot, creating convection currents which are responsible for the movement of plates.

The core is the innermost layer of the earth. It consists of outer core and inner core. The outer core is made up of liquid state and inner core is made up of solid state. The core is mostly made up of iron and nickel. Earth’s core is responsible for the generation of the magnetic field, which protects from the high energy particles of solar wind.

Q. 4. B. Draw neat diagrams, label them and explain.

Magnetic pole and equator.

Answer :



The magnetosphere is the region of space surrounding earth where the dominant magnetic field is the magnetic field of the earth, rather than the magnetic field of interplanetary space. North Pole and South Pole are the two magnetic poles of the earth. The magnetic poles of the earth are different from geographical poles as shown in the above figure.

Equator is an imaginary line along the middle of the Earth at an equal distance from the North Pole and South Pole.

Q. 5. A. Give geographical reasons:

There are discontinuities in the interior of the earth.

Answer : The discontinuities in the interior are boundaries between crust, mantle, and inner core. They also exist within crust, mantle, and core.

Discontinuities are formed due to variation in the composition of the earth's interior at different layers. Each of these layers consists of materials having a distinct composition, physical and chemical properties. For instance, Conrad discontinuity exist within earth's crust because the Continental crust is made up of silica and aluminum and Oceanic crust is made up of silica and magnesium.

Q. 5. B. Give geographical reasons:

There is correlation between the density of metals and their location in the interior of the earth.

Answer : Earth's interior is not uniform and consists of different materials with different physical and chemical properties. As it is known that the materials with less density float over the materials with large density, the stratification of the earth's interior also holds the same. The crust is the outermost layer of the earth because it is lighter than mantle and core. The core is the innermost layer and has a density greater than crust and mantle.

Q. 5. C. Give geographical reasons:

Mantle is the centre of earthquake and volcanic eruptions.

Answer : The Mantle is the layer beneath the earth's crust. The upper mantle is called asthenosphere. Which is in a liquid state. In this layer, the rock material deforms more readily, and magma formation takes place. The internal energy released due to endogenic movement caused in the mantle is responsible for earthquake and volcanic eruptions.

Q. 5. D. Give geographical reasons:

The thickness of the crust below the continents is more as compared to oceans.

Answer : The width of continental crust varies between 35-40 km whereas the width of oceanic crust is between 7-10 km. Orogeny takes place on the continental crust which creates mountains and thickens the crust. More mass accumulates with time which eventually increases the width of continental crust.

Q. 5. E. Give geographical reasons:

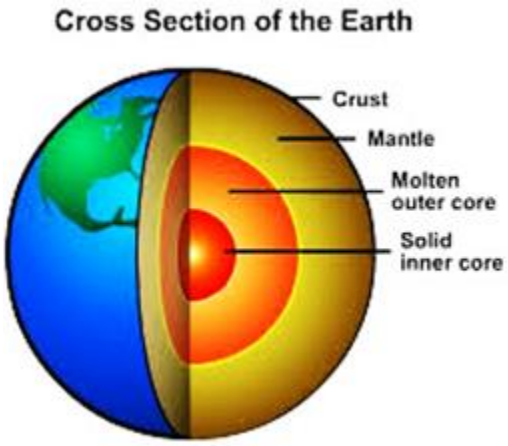
Earth is protected because of the magnetosphere

Answer : The magnetosphere is the region of space surrounding Earth where the dominant magnetic field is the magnetic field of Earth. This magnetic field protects the earth's atmosphere from the harmful solar winds coming from the sun. These solar winds consist of high energy particles which have the potential to disrupt the earth's communication system.

Activity

Q. 1. Prepare a model of the earth's interior.

Answer :



Intext Questions

Q. 1. When an earthquake occurs, what happens exactly?

Answer : An earthquake is the sudden shaking of the earth which is caused when the two blocks of rocks or two plates are rubbing against each other or strikes one another in the interior of the earth. It results from the sudden release of energy in the earth's lithosphere that creates seismic waves.

Due to the striking of the plates trembling is caused on the surface of the earth. Exactly when an earthquake strikes, at the earth's surface earthquakes manifest themselves by shaking and displacing or disrupting the ground.

When the epicenter of the earthquake is located in the sea, the seabed may be displaced sufficiently to cause a tsunami.

Q. 2. How are igneous rocks formed?

Answer : Igneous rocks are one of the three types of rocks, others being sedimentary and metamorphic rocks, which are formed during a volcanic eruption. These rocks are formed through the cooling and solidification of magma or lava which comes out when a volcano erupts. Solidification into rocks occurs either below the surface which is known as intrusive rocks or on the surface which is known as extrusive rocks.

Q. 3. What is a volcano?

Answer : A volcano is a mountain or hill, conical in shape and has a vent or hole called crater through which lava or magma, gases, rocks, and fragments come out. In other words, it is a rupture in the crust of the earth and not only of the earth but also on other celestial bodies. When the material escapes, it causes an eruption. An eruption can be explosive, sending material high into the sky or it can be calmer with gentle flows of the material.

Q. 4. Which materials come out during a volcanic eruption?

Answer : The volcanic areas usually form mountains built from the many layers of rock ash or other material that collect around them. During a volcanic eruption, the materials which come out or are ejected into the earth's atmosphere and onto the earth's surface are hot magma or lava, gases, steams, cinders, gaseous sulphur compounds, ash, and broken rock pieces. Lava bombs and pyroclastic material are also thrown out by a volcano when it erupts.

Q. 5. In which state of matter are these materials?

Answer : There are five known phases or states in which the material comes out. The matter or material which comes out of a volcano during a volcanic eruption is either solid like rocks and other solid fragments or liquid which is molten magma or lava or gases like gaseous sulphur compounds and in the form of water vapors like steam.

Q. 6. Are these materials cool or hot? Why?

Answer : All the materials are hot. The primary material which comes out of a volcano is lava. It is extremely hot and molten in the state. All other materials which come out of a volcano like steam gases, gaseous sulphur compounds and broken pieces of rocks are also very hot and have a heat radiating effect to long distance.

The temperature of the erupted or ejected materials is very high because deep within the earth it is so hot that some rocks melt and slowly becomes a thick flowing substance called magma.

Q. 7. Can we dig deep from one side of the earth and come out from the other side? Write your imaginations in your notebooks and discuss in class.

Answer : It is very impractical to think of digging a hole into the earth of such a depth that we can come out of the other side.

There is a lack of oxygen deep within the layers of the crust. To make the journey possible to some extent one has to carry the source of oxygen which must be enough to cover such a large distance inside the earth.

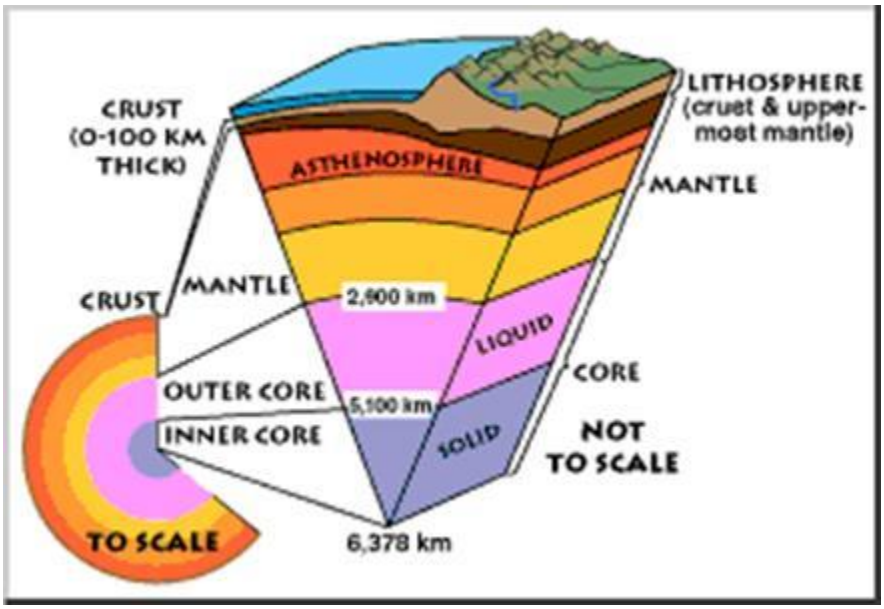
Moreover, the temperature is too high below the surface of the earth. The tunnel will collapse just a few miles underground due to high pressures on rock walls, and the person will get stuck there. If one enters a hole which digs deep into the surface then surely his or her life will be in danger. The person would risk his life and will die.

The high-pressure liquid iron in the core would flood into the tunnel, and maybe the person has to swim through it which is not possible unless until the person has insulating protection.

Hence there are no possible ways to fight the natural conditions of the earth's surface and dig out hole starting from one end to come out of the other side.

Q. 8. Imagine the earth's interior and write 10-12 sentences on it.

Answer : Given below is the diagram of the interior of the earth which shows different layers inside the earth:



Structure of the earth:

1. The earth is believed to have a solid inner core made mostly of iron and nickel.

2. The diameter of the core is estimated to be 7000 km compared with a 12,700 km diameter of the entire planet.

3. The crust is only a few tens of kilometers thick.

4. The region between the core and the crust is called *the mantle*. It is composed mainly of solid materials of the earth.

5. The upper part of the crust and the mantle together are called *lithosphere.*

• One would experience a high pressure which is at the center of the earth and extremely high because of all of the weight of the entire planet pushing inwards onto it.

• If one happens to be inside the surface of the earth or the interior of the earth one would observe that it is made up of a series of layers that sit below the surface crust. One would observe that these layers include the solid but flowing mantle, the liquid outer core, and the solid iron outer core.

• The outer core has so much heat and pressure that the rocks have melted in the current years. The increased heat and pressure are great that the iron and its alloys have become solid in the inner core.

Humidity And Clouds

Exercise

Q. 1. Match the column and complete the chain:

A	B	C
(A) Cirrus	(i) Vertical extent in the sky	(a) Roaring clouds
(B) Cumulonimbus	(ii) higher altitude	(b) Floating clouds
(C) Nimbostratus	(iii) Medium altitude	(c) continuous rainfall
(D) Alto-cumulus	(iv) Low altitude	(d) snow flake clouds

Answer : (A) Cirrus – (ii) Higher altitude – (d) Snow flake clouds

Explanation- Cirrus is a high-level cloud with an altitude of 7000 to 14000 metres. They are called snow flake clouds because they are composed of ice particles.

(B) Cumulonimbus – (i) Vertical extent in the sky- (a) roaring clouds

Explanation- Cumulonimbus are mountain-like huge vertical clouds which are formed as a result of strong upward water vapour currents in the atmosphere.

They are known as roaring clouds as they are responsible for thunderstorms and lightening.

(C) Nimbostratus – (iv) Low altitude – (c) continuous rain.

Explanation- Nimbostratus clouds are low-level clouds with an altitude of fewer than 2000 metres. They are dark and have dense layers which block the sun and hence cause continuous and persistent rains.

(D) Alto-cumulus – (iii) Medium altitude – (b) floating clouds

Explanation- Alto-cumulus is a mid-level cloud with an altitude of about 2000 to 7000 metres. They contain water droplets and appear puffy. Due to condensation, the clouds become light weight and float in the air. Hence they are called floating clouds.

Q. 2. Choose the correct word from the brackets and complete the sentence:

(Cumulonimbus, Relative humidity, Absolute humidity, Condensation, Vapour-holding capacity)

(a) The _____ of air is dependent on the temperature of the air.
(b) The amount of vapour in 1 cu.m. of air shows the _____ .
(c) As _____ is less in desert areas, the air is dry there.
(d) _____ type of clouds are indicators of the storm.
(e) In a free environment, the _____ of the vapour present in the atmosphere takes place around dust particles.

Answer : (a) Moisture-holding capacity

Explanation: The moisture holding capacity of air is dependent on the temperature of the air. The capacity of the air to hold moisture increases with an increase in the temperature. For example, at 40°C, the moisture holding capacity of the air is 51.12 gm/cu.m.

(b) Absolute humidity

Explanation: Absolute humidity is the amount of water vapour in 1 cu.m of the atmosphere. For instance, near coastal regions, absolute humidity in the air is likely to be higher than near the poles.

(c) Relative humidity

Explanation: Relative humidity is less in desert regions. This is because high temperature reduces the relative humidity of a particular place.

(d) Cumulonimbus

Explanation: Cumulonimbus clouds are indicators of the storm. They are huge and appear dark in colour. They cause rain accompanied by storm and tornadoes.

(e) Condensation

Explanation: In a free environment, the condensation of the vapour present in the atmosphere takes place around dust particles. This is because minute particles of dust, salt, smoke etc. soak water easily.

Q. 3. A. Differentiate between:

Humidity and clouds

Answer :

S.no.	Humidity	Clouds
1.	Humidity refers to "the quantity of water vapour present in the atmosphere."	Clouds refer to a collection of water vapour at a greater height in the sky.
2.	Humidity determines whether the air is dry or damp.	Clouds depend on the process of condensation for their formation.
3.	Humidity can be classified into two types: Absolute Humidity and Relative Humidity.	Clouds are divided into different types: High clouds (ex. Cirrus), Medium clouds (ex. Altocumulus), Low clouds (ex. Strato-cumulus) and Cumulonimbus clouds

Q. 3. B. Differentiate between:

Relative humidity and Absolute humidity

Answer :

S.no.	Relative Humidity	Absolute Humidity
1.	It is expressed as a percentage of the amount of water vapour present in the air to the vapour holding capacity of the atmosphere at the same temperature and same volume.	It is the measure of water vapour in 1 cu.m. of air
2.	It is affected by geographic location and temperature of a particular region.	It is influenced by the land and water distribution on earth as well as seasonal changes.
3.	Relative humidity is expressed in a percentage.	Absolute Humidity is expressed in grams or kilograms per cubic metre.
4.	It is subject to change with a change in the amount of water vapour	It remains relatively constant. It contains an absolute measure of moisture in the atmosphere.

Q. 3. C. Differentiate between:

Cumulus clouds and cumulonimbus clouds

Answer :

S.no.	Cumulus clouds	Cumulonimbus clouds
1.	Cumulus clouds are formed due to the vertical flow of air.	When the vertical flow of the air increases, the cumulus clouds gradually transform into Cumulonimbus clouds.
2.	Cumulus clouds appear huge and are dome-shaped.	Cumulonimbus clouds appear like huge mountains and have an anvil shaped top portion.
3.	These clouds are grey in colour and are responsible for fair and pleasant weather.	These are dark coloured clouds which cause thunder and lightening.
4.	These clouds are also called `fair weather clouds.	These clouds are also known as `thunderheads'.

Q. 4. A. Answer the following questions:

Why is the air in a region dry?

Answer : The air in a region is dry primarily due to low moisture content. Moreover, distance from the sea, the high speed of the wind and increased rate of evaporation contribute to a decrease in the moisture holding capacity of the atmosphere.

For example, in Rajasthan, the air is dry and hot leading to the low moisture content in the air.

Q. 4. B. Answer the following questions:

How is humidity measured?

Answer : Humidity is measured in grams per cubic metres. The air is considered to be dry when the humidity in the air is 0 gm/cu.m. Whereas the air is saturated when the humidity at 30°C temperature is 37gms/cu.m.

Q. 4. C. Answer the following questions:

What are the prerequisites for condensation?

Answer : Condensation is a process by which water vapour is converted into water. The following are the prerequisites for condensation to take place:

1. Firstly, the presence of water vapour in the atmosphere is required for condensation to occur.

2. Secondly, low temperature is important as it decreases the moisture holding capacity of the air which leads to condensation.

3. Finally, fine particles such as dust, salt etc. need to be present around which condensation happens.

Q. 4. D. Answer the following questions:

What is a cloud? Write its types.

Answer : A cloud is a collection of water vapour and fine particles at a greater height in the sky formed due to the process of condensation.

According to international classification, clouds are divided into three main types based on their altitudes above sea level:

1. High clouds: The clouds which are at the height of 7000 to 14000m and contain ice particles are known as high clouds. They include Cirrus, Cirrocumulus and Cirrostratus clouds.

2. Medium clouds: These clouds have a general altitude of 2000 to 7000 metres. They comprise alto-stratus and alto-cumulus clouds.

3. Low clouds: These are at an altitude of fewer than 2000 metres. They are divided into five types.

a) Strato-cumulus

b) Stratus Clouds

c) Nimbostratus clouds

d) Cumulus clouds

e) Cumulonimbus clouds.

Q. 4. E. Answer the following questions:

Which type of clouds gives rain?

Answer : A cloud is a collection of water vapour, and fine particles at a greater height in the sky formed due to the process of condensation.

Nimbostratus clouds lead to uninterrupted precipitation and even snowfall. These low-level clouds have thick layers and are grey in colour which blocks out the sun.

Q. 4. F. Answer the following questions:

On what does the percentage of relative humidity depend?

Answer : Relative humidity is determined by the amount of water vapour in the atmosphere (called absolute humidity) in proportion to the vapour holding capacity at the same temperature and same volume.

$$\text{Relative humidity (\%)} = \frac{\text{Absolute} - \text{humidity (\%)}}{\text{Vapour holding capacity}} \times 100$$

Relative humidity is inversely proportional to the temperature. When the temperature decreases, Relative humidity increases. It is low when the temperature is high.

Therefore, Relative humidity is usually higher in mornings and nights but lower in afternoons due to the increase in temperature.

Q. 5. A. Give geographical reasons:

Clouds float in the sky.

Answer : Due to the process of condensation, fine water and ice particles float in the air at higher elevation as they are light in weight. These particles gather around to form clouds. Clouds float in the sky due to the vertical flow of the air.

Q. 5. B. Give geographical reasons:

The proportion of relative humidity changes according to altitude.

Answer : Elative humidity changes with a change in the temperature and altitude of a particular region. As the altitude of a place increases, the air gets thin and the moisture holding capacity of the air decreases (low atmospheric pressure) which results in reduced humidity.

Q. 5. C. Give geographical reasons:

Air becomes saturated.

Answer : When the water evaporates from the earth, it is released into the air. The air has a maximum ability to hold moisture in a certain quantity and at a particular temperature only. When this ability is reached, and relative humidity reaches 100%, the air is considered to have reached its saturation point.

In other words, when the proportion of water vapour and the vapour holding capacity is equal, the air is said to be saturated.

Q. 5. D. Give geographical reasons:

Cumulus clouds change into cumulonimbus clouds.

Answer : Cumulus and cumulonimbus clouds are low clouds. These are at an altitude of fewer than 2000 metres. Cumulus clouds are responsible for pleasant weather. Due to an increase in the vertical flow of air, cumulus clouds get turned into cumulonimbus clouds which leads to rain.

Q. 6. A. Solve the following:

When the temperature of the air is 30° C, its vapour-holding capacity is 30.37 gms/ cu. m. If absolute humidity is 18 gms / cu. m. then what would be the relative humidity?

Answer : Given:

Temperature- 30°C

Vapour holding capacity- 30.37 gms/cu.m.

Absolute Humidity- 18 gms/cu.m.

$$\text{Relative humidity} = \frac{\text{Absolute} - \text{humidity}\,(\%)}{\text{Vapour holding capacity}} \times 100$$

$$= \frac{18 \times 100}{30.37} = 59.27\%$$

Q. 6. B. Solve the following:

What would be the absolute humidity of air if 1 cu. m. air contains 4.08 gms of vapour at 0°C temperature?

Answer : Absolute humidity is defined as “the amount of water vapour in 1 cu. m. of air.”

Given, water vapour= 4.08 gms

Volume of air= 1 cu. m.

Q. 7. Collect the weather-related information from newspapers for the month of July. Relate the difference in the maximum and minimum temperatures with humidity.

Answer : For the month of July 2018 in Mumbai, high temperatures were usually around 31°C, hardly falling below 27°C or exceeding 33°C.

While low temperatures for the month were around 27°C, hardly falling below 23°C or rising above 27°C.

Table 1.1 shows the high and low temperatures with their respective average temperatures and humidity percentage levels for the month of July.

July	High Temperatures	Average High Temperatures	Low Temperatures	Average Low Temperatures	Average Humidity levels (in %)
1	33°C	30°C	24°C	25°C	70.49%
8	27°C	30°C	23°C	25°C	94.07%
15	29°C	29°C	26°C	25°C	91.15%
22	30°C	29°C	26°C	24°C	75.49%
29	31°C	29°C	27°C	24°C	81.87%

According to the weather reports of Mumbai, July 2018 was the most humid month of the year.

Activity

Q. 1. Make a table showing the types of clouds. Use various photographs.

Answer :

No.	Types of Clouds	Altitude (in metres)	Classification	Pictures
1.	Cirrus	7000 to 14000	High	
2.	cirrostratus			
3.	cirrocumulus			
4.	Alto-Stratus	2000 to 7000	Middle	
5.	Alto-cumulus			

6.	Strato-cumulus	Less than 2000	Low	
7.	Stratus			
8.	Nimbostratus			
9.	Cumulus	The extent could be variable	Vertical development	
10.	Cumulonimbus			

Intext Questions

Q. 1. Look at the pictures shown in figure 3.1. Discuss the weather conditions shown in these pictures in the class and write the descriptions in the boxes below

Answer : In the first picture, the day is hot, and the people are predicting that a sandstorm is on the rise.

In the second picture, the day is very hot, it must be a summer noon and the people are indeed feeling very hot. Also, the weather conditions are very humid, the humidity is high in the air and hence it is very sweaty.

In the third picture, the day is very cold, mostly the winter season in on the go over there. To prevent the children from catching cold, the mother advices them to wear the sweater and play.

In the above discussion, the words hot, moist, cool etc. show the condition of the air. They relate to the content of the moisture in the air.

Q. 2. During winters, when you exhale on the glass of your mirror, what happens. If you try to do this in summer why doesn't this happen?

Answer : For precipitation to occur, the conditions should be humid and the moisture content in the air must be high.

In winters, the air that we exhale, is hotter than the air that is present surrounding the window glass. Hence, when the hot air from our mouth touches the cool surface of the window glass, it precipitates to form water droplets.

In summers, the air that we exhale, is cooler than the air that is present surrounding the window glass. Hence, when the cool air from the mouth touched the hot surface of the window, no precipitation occurs and no water droplets are formed.

Precipitation usually occurs only when hot air touches cooler surfaces.

Q. 3. The vapour holding capacity of 1 cu. m. of air in various temperatures is given here. Calculate the difference in the capacities by observing the table.

Temperature of the air(0 C)	Vapour holding capacity (gm/ cu.m.	Difference in the capacities (gm/ cu.m)
-5	3.26	---
0	4.85	1.59
5	6.80	
10	9.40	
15	12.83	
20	17.30	
30	30.37	
40	51.12	

Answer :

Temperature of the air(0 C)	Vapour holding capacity (gm/ cu.m.	Difference in the capacities (gm/ cu.m)
-5	3.26	---
0	4.85	1.59
5	6.80	1.95
10	9.40	2.6
15	12.83	3.43
20	17.30	4.47
30	30.37	13.07
40	51.12	20.75

Q. 4. What will happen if the temperature of saturated air at 20° C drops down to 10° C abruptly?

Answer : With the decrease in temperature from 20 degree C to 10 degree C there will be a relative fall in humidity. With the change in temperature the humidity content of the air changes.

The cold air is capable of holding less water content than that of warmer air even when fully saturated. The temperature fall will make the air lose its moisture content and reduce the humidity index.

Saturation level is that point where no further addition can be made to the present state.

Q. 5. Look at figure 3.8 first. Now go out of the classroom in the ground. Observe the clouds in the sky. Discuss the following points in the class and write answers in your notebook.

• What was the colour and size of the clouds?

• What type of clouds did you observe? (Take help from fig 3.8)

• Can these clouds bring rain? Give reasons.

Answer : • The colour of the clouds is white and they are not huge in size.

• The altitude is less, so I think they might be cumulonimbus clouds or cumulus clouds

• Yes, these clouds can bring continuous rainfall. The low altitude clouds consist of five types of clouds. They are also called as Strato-cumulus clouds. They have layers. Their colour is white to earthy. Round clusters of clouds can be here. Stratus clouds also have layers. They are ash coloured and their base is uniform. Nimbo-stratus has thick layers. They are grey-ash in colour and cause continuous rainfall and even snowfall.

Structure Of Ocean Floor

Exercise

Q. 1. A. Choose the correct option:

Like there are landforms on land, ocean floor also has submerged landforms because ……

A. There is land under water
B. There are volcanoes under water
C. Land is continuous and there is water in deeper parts.
D. Though land is continuous, its level is not the same everywhere like that of water.

Answer : Though land is continuous, its level is not the same everywhere like that of water. Continental crust and oceanic constitute part of the lithosphere.

Q. 1. B. Choose the correct option:

Which part of the ocean floor is most useful to the man?

A. Continental shelf
B. Continental slope
C. Abyssal plains
D. Marine deeps

Answer : It is the land near the coast and submerged under the sea. It is shallow and provides rich fishing ground due to the presence of adequate sunlight and plankton. Various minerals sources like polymetallic nodules and oil and gas are also found on the continental shelf. Ex: Mumbai High.

Q. 1. C. Choose the correct option:

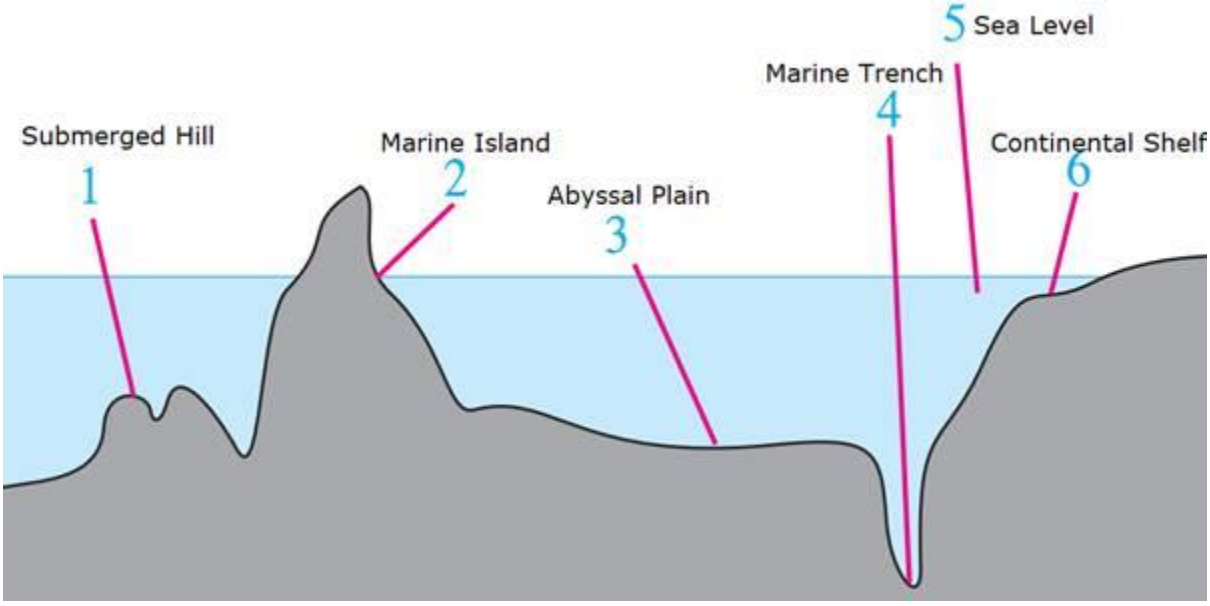
Which one of the following options is related to marine deposits?

A. Rivers, glaciers, remains of plants and animals
B. Volcanic ash, continental shelf, remains of plants and animals
C. Volcanic ash, lava, fine particles of soil
D. Volcanic ash, remains of plants and animals, abyssal plains

Answer : Marine deposits are generally found in the continental shelf. These include remains of plants and animals, soil particles, lava and volcanic ash. The mixture of these lies in the form of fine clay. These deposits are important to know more about marine life and minerals in the ocean bed.

Q. 2. A. Name the landforms shown in the figure.

Answer :



Q. 2. B. Which of these landforms is useful for deep sea research?

Answer : Trenches, abyssal plains etc are useful for deep sea research. Trenches are the some of the most seismically zones which are responsible for causing earthquakes. Rock sediments from ocean floor have helped the scientists to determine its age which subsequently led to the development of plate tectonics theory.

Q. 2. C. Which of these are appropriate to be used for the protection of marine borders and naval-base building?

Answer : Islands are useful for protection of marine borders and naval-base building. For instance, India has a naval base at Andaman and Nicobar Islands.

Q. 3. A. Give geographical reasons:

The study of the ocean floor is useful to man.

Answer : The ocean floor is the land beneath the ocean. It has diverse landforms ranging from the continental shelf to trenches and mountains. Continental shelves are resource-rich regions. They are rich fishing grounds due to the presence of adequate sunlight and plankton.

The study of the ocean floor is useful for deep sea research. For instance, by determining the age of rocks, scientists have developed plate tectonics theory which

explains the formation of various landforms like mountains, trenches, and activities like volcanoes and earthquake.

Q. 3. B. Give geographical reasons:

The continental shelf is a paradise for fishing activity.

Answer : The continental shelf is the land near the coast which is submerged under the sea. These are the extended margins of the continent. It is considered a paradise for fishing activity because of the favorable conditions available for growth of fishes. As the continental shelf is shallow, good amount of sunlight reaches on its bed facilitating the growth of planktons and algae which serves as food for fish.

Q. 3. C. Give geographical reasons:

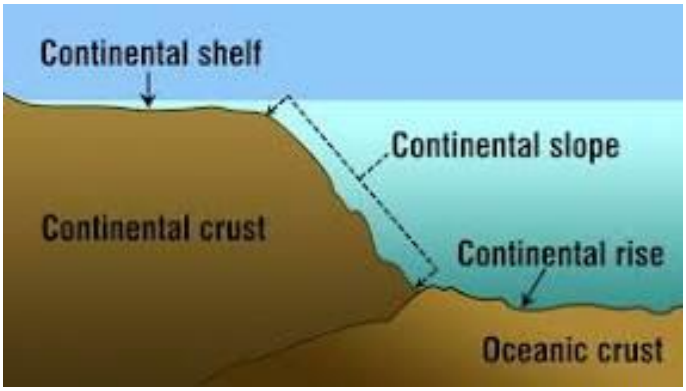
Some marine islands are actually the peaks of Sea Mountains.

Answer : The ocean floor is the land beneath the ocean. It contains diverse submerged landforms. There are several submerged hills and mountains on the ocean bed. They comprise of various hills of various sizes. The peaks of some of these mountains come above the sea level. These are known as marine islands. Ex: Iceland, Andaman and Nicobar Islands.

Q. 3. D. Give geographical reasons:

The continental slope is considered to be the boundary of continents.

Answer : The continental slope is the transitional region connecting the continental shelf and the ocean basin. It begins after the extent of the continental shelf is over with a steep slope. The continental crust (30km) is thicker than oceanic crust (7-10km), thus continental slope is considered to be the boundary of continents.



Q. 3. E. Give geographical reasons:

The disposal of waste materials in the oceans by man is harmful to the environment.

Answer : Various types of materials get deposited on marine beds. Materials like pebbles, clay, volcanic ash etc get deposited by natural process. However, some man-made wastes like micro plastics, sewage, solid waste, the radioactive material also get deposited on large scale. The Great Pacific Garbage Patch in the central North Pacific Ocean is the largest accumulation of ocean plastic in the world. The disposal of these wastes in oceans can be harmful to the environment. For instance, marine animals often mistake micro plastics as food because of their small size. These plastics contain toxic chemicals and consumption of these can cause disease and affect reproduction.

Q. 4. Observe the map on Pg. 27 in 'Give it a try' and answer the following questions:

(a) Madagascar and Sri Lanka are related to which landform of the ocean floor?

(b) Near which continent are these landforms located?

(c) Which islands in our country are examples of peaks of submerged mountains?

Answer : (a) These can be considered as Marine Islands i.e. as peaks of the submerged mountains and hills on the ocean bed.

(b) Sri Lanka is located near Asia and Madagascar near African continent.

(c) Andaman and Nicobar Islands. These are considered to be emergent peaks of a submerged mountain range related to the Arakan Yoma range of Myanmar.

Activity

Q. 1. Prepare a model of the ocean floor.

Answer :

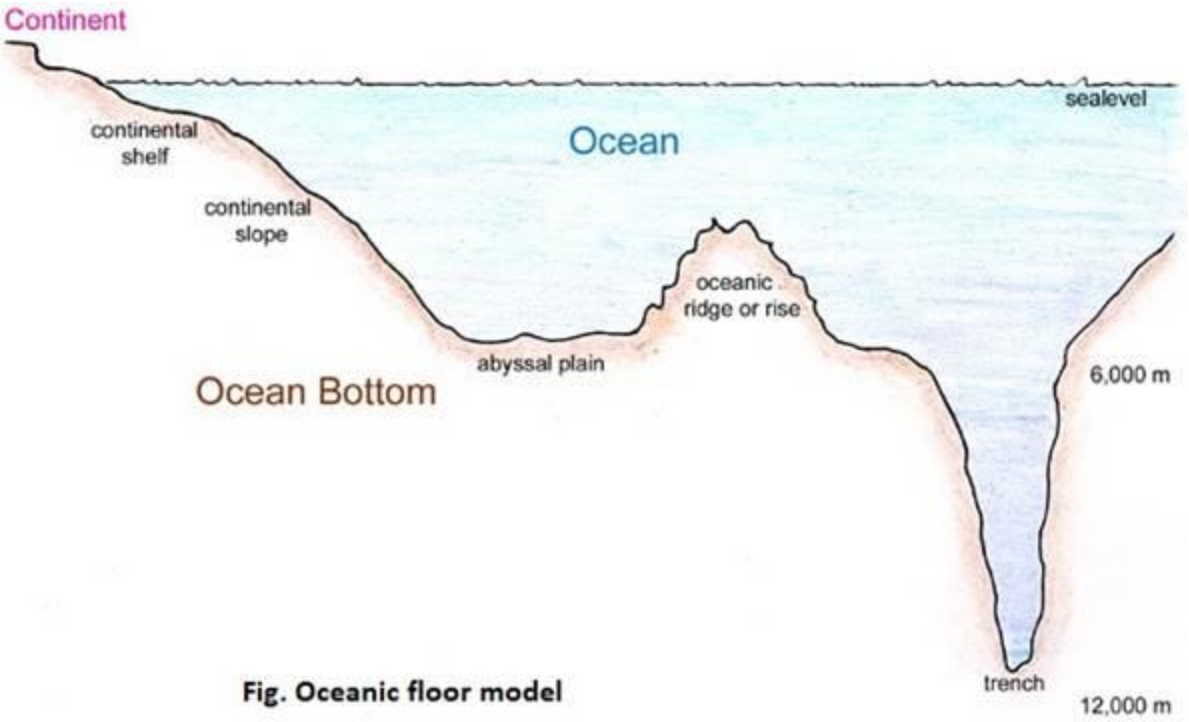


Fig. Oceanic floor model

Intext Questions

Q. 1. • Continents and oceans are a part of the lithosphere and hydrosphere respectively.

• Continents and oceans lie on plates

• During low tides, the level of ocean water goes down and the land below the water near the coast is exposed.

• Ships wreck when they strike against the rocks in the ocean.

If the above points are correct, then select the most appropriate option from the following:

(i) The surface of the earth is occupied by land and water

(ii) There is land below the ocean too.

(iii) Even if the water has the same level, the land submerged is not even.

(iv) The level of water and land is uneven.

(v) Discuss in the class regarding the choice of your options. Know from your teachers about the correct option.

Answer : 1. Continents are a part of lithosphere and oceans and other water bodies are a part of the hydrosphere. Lithosphere essentially relates to land and hydrosphere essentially relates to water. Hence the statement is true.

2. Yes, continents and oceans lie on plates. There are continental plates and oceanic plates on which continents and oceans lie. The movement of these plates affects the movement of the continents and oceans.

3. True. The statement is true as low tides refer to the decrease in the height of the waves of the ocean which are otherwise referred to as tides. Hence when there are low tides, the level of water goes down and the land area is exposed.

4. Yes, when ships hit the hard rocks, they break down.

All the points above are correct, hence the most appropriate answer or choice would be:

There is land below the ocean too.

Q. 2. If the classification of landforms on land can be done on the basis of altitude and size, then how can the landforms submerged under water be classified?

Answer : If the classification of landforms on the land can be done on the basis of altitude and size, then the landforms submerged under the water might be classified based upon their depth or the shape they make with the flowing water that carries the mud, silt and other residues on the way of its disposal in the seas and oceans. These landforms formed by water are usually called the coastal landforms and they include stacks, stumps, caves, arches, bays, coves, beaches and cliffs.

Q. 3. Try to name the landforms shown in figure 4.1

Answer : Mountain, continental coast, continental shelf, continental slope, abyssal plain, marine trench, marine deep, mid-oceanic ridges.

Q. 4. What parameters were used for classifying the landforms on the earth?

Answer : The heights of the landforms, the distance of them from the ground level and ocean level, etc were used for classifying the landforms on the earth.

Q. 5. What parameters were used for naming the landforms below water?

Answer : The establishment of criteria with fixed parameters, use of DEMs for variables calculation allows the relief mappings are reducing subjectivity, the depth of the landforms inside the ocean etc.

Q. 6. From the map of the ocean floor identify the ocean.

Answer : The ocean in the map is Indian Ocean.

Q. 7. Can you identify and name the submerged landforms shown in the diagram?

Answer : Mountain, continental coast, continental shelf, continental slope, abyssal plain, marine trench, marine deep, mid-oceanic ridges.

Q. 8. Which region would be ideal for fishing and why?

Answer : The continental shelf is very important from the point of view of humans. Extensive fishing grounds are found on the continental shelf. As this part is shallow, the sunlight reaches its bed. Algae, plankton, etc. grow here. This is food for fish.

Ocean Currents

Exercise

Q. 1. A. Choose the correct option:

In which ocean does the Labrador current flow?

A. Pacific
B. South Atlantic
C. North Atlantic
D. Indian

Answer : Labrador is cold oceanic current originating in Arctic Ocean and flowing south along the coast of Labrador, Canada. Other ocean currents include Gulf Stream, East Greenland current, Florida current, etc.

Pacific Ocean: Ocean currents in Pacific include Oyashio, Kuyoshio, Humboldt, California, etc.

South Atlantic: Ocean currents in South Atlantic include Brazil current, Falkland current, etc.

Indian Ocean: Ocean currents in Indian Ocean include Somali current, Madagascar current, West Australian current, Agulhas current, etc.

Q. 1. B. Choose the correct option:

Which current out of the following flows in the Indian Ocean?

A. East Australian Current
B. Peru current
C. South Polar current
D. Somali current

Answer : Somali current flows in the Indian Ocean. Peru and east Australian Current flow in the Pacific Ocean. South Polar current flows in the Southern Ocean.

North Atlantic: ocean currents in North Atlantic include Labrador Current, Gulf Stream, East Greenland current, Florida current, etc.

Pacific Ocean: Ocean currents in Pacific include Oyashio, Kuyoshio, Humboldt, California, etc.

South Atlantic: Ocean currents in South Atlantic include Brazil current, Falkland current, etc.

Indian Ocean: Ocean currents in Indian Ocean include Somali current, Madagascar current, West Australian current, Agulhas current, etc.

Q. 1. C. Choose the correct option:

Which factor out of the following does not affect the region along the coast?

A. Precipitation
B. Temperature
C. Land breezes
D. Salinity

Answer : Salinity doesn't affect the region along the coast as much as the other factors.

Along the coast, precipitation is more due to more availability of water. Temperature along the coast is not extreme as sea acts as a moderating factor. Land breezes are breezes blowing towards the sea from the land.

Q. 1. D. Choose the correct option:

Which of the following occurs in the area where the cold and warm currents meet?

A. High temperature
B. Snow
C. Low temperature
D. Thick fog

Answer : When warm air from warm ocean current blows over the cold Current, water vapor condenses, resulting in the formation of a thick fog.

Q. 1. E. Choose the correct option:

Which of these following currents flows from the northern polar region upto Antarctica?

A. Warm ocean currents
B. Surface ocean currents
C. Cold ocean currents
D. Deep ocean currents

Answer : Deep ocean currents are those water currents which flow beyond the depth of 500m. They are driven by density and temperature gradients. This process is known as thermohaline circulation.

Warm ocean currents: They flow away from the equatorial region on the western side of ocean basins towards the poles. They are warmer than the surrounding water and so they are called warm currents.

Surface ocean currents: The water at the ocean surface is moved primarily by winds that blow in certain patterns because of the Earth's spin and the Coriolis Effect. Winds are able to move the top 400 meters of the ocean creating surface ocean currents.

Cold ocean currents: The ocean currents that flow from the polar areas towards the Equator are cooler compared to the surrounding water, so they are called cold currents. They are usually found on the west coast of the continents in the low and middle latitudes in both the hemispheres and on the east coast in the middle latitudes.

Q. 2. A. Examine the given statements and correct the wrong ones.

Ocean currents give specific direction and velocity to the water

Answer : True

Ocean currents are the horizontal continuous flow of a mass of water from one place to another. They acquire a specific direction and velocity due to differences in temperature, density, planetary winds, rotation of the earth, continental structure etc.

Q. 2. B. Examine the given statements and correct the wrong ones.

The deep ocean currents flow with high velocity

Answer : False

Deep ocean water constitutes about 90% of the ocean water. Unlike, surface ocean currents which are driven by high-speed planetary winds, deep ocean water is driven by differences in temperature and density. Thus, the velocity of deep ocean currents is low compared to surface currents. The redistribution of the ocean water through the movement of Deep Ocean current is a continuous process and it takes around 500 years to complete one cycle of redistribution of ocean water.

Q. 2. C. Examine the given statements and correct the wrong ones.

Generally, surface ocean currents are formed in the equatorial regions.

Answer : False

Surface ocean currents move from equator to the poles and vice versa. They are of two types: Warm ocean current and cold ocean current. Warm ocean current move from equator to poles and cold ocean currents move from poles to equator.

Q. 2. D. Examine the given statements and correct the wrong ones.

Ocean currents hold great importance for human life.

Answer : True

Ocean currents hold great importance for human life due to the foll. reasons:

1. Ocean currents involve the transfer of heat energy from heat surplus regions to heat deficit regions.

2. The presence of warm water currents along western Europe in winter ensures that ports do not freeze.

3. The mixing of cold and warm water currents results into formation of large fishing grounds.

4. The speed and direction of ocean currents are also utilized for the easy movement of ships using less fuel.

Q. 2. E. Examine the given statements and correct the wrong ones.

The movement of icebergs is not dangerous for water transport.

Answer : False

Ocean currents are the horizontal continuous flow of a mass of water from one place to another. Cold ocean current flow from poles to the equator. In this process, there are chances that iceberg gets carried along the current and coming in way of marine routes posing danger to ships.

Q. 2. F. Examine the given statements and correct the wrong ones.

Water becomes warm near Brazil due to ocean currents. On the other hand, it becomes cold near the African coast.

Answer : True

Water becomes warm near Brazil due to the presence of warm Brazil ocean current near the Brazil coast. The Benguela current is a cold ocean current which makes the southwestern coast of Africa cold.

Q. 3. A. Explain the effect of -

Warm ocean currents on climate

Answer : Ocean currents are the horizontal continuous flow of a mass of water from one place to another. Ocean currents involve the transfer of heat energy from heat surplus regions to heat deficit regions. As a result, the climate of the region in the vicinity to the ocean current is affected. In cold regions where warm ocean currents flow, the climate becomes warmer. For instance, the presence of warm water currents along western Europe in winter ensures that ports do not freeze.

Q. 3. B. Explain the effect of -

Cold ocean currents on the movement of icebergs

Answer : Ocean currents are the horizontal continuous flow of a mass of water from one place to another. They are of 2 types – warm and cold ocean current. Cold ocean current flows from poles to the equator. In this process, there are chances that iceberg from the polar areas gets carried along the current. This, in turn, poses threat to marine routes where frequent movement of ships takes place.

Q. 3. C. Explain the effect of -

The shape of the coast line on ocean currents.

Answer : Ocean currents are the horizontal continuous flow of a mass of water from one place to another. The shape and position of coastline play a crucial role in guiding the direction of ocean currents.

Q. 3. D. Explain the effect of -

Meeting of warm and cold ocean currents

Answer : Ocean currents are the horizontal continuous flow of a mass of water from one place to another. They are of 2 types – warm and cold ocean current. The meeting of cold and warm currents results into a meeting of the overlying warm air and cold air. The warm air meeting the colder air will cool the warm air below its dew point resulting in the formation of a thick fog. This meeting point of ocean currents also provides a rich ground for fishing due to the abundant presence of plankton.

Q. 3. E. Explain the effect of -

The transportational capacity of ocean currents

Answer : Ocean currents are the horizontal continuous flow of a mass of water from one place to another. They are driven by numerous factors like differences in density and temperature, planetary winds etc. The redistribution of the ocean water through the movement of deep ocean current is a continuous process and it takes around 500 years to complete one cycle of redistribution of ocean water.

Q. 3. F. Explain the effect of -

Deep ocean currents

Answer : Deep ocean currents are those water currents which flow beyond the depth of 500m. They are driven by density and temperature gradients. They constitute about 90% of the ocean water. The redistribution of the ocean water through the movement of deep ocean current is a continuous process and it takes around 500 years to complete one cycle of redistribution of ocean water. Redistribution of nutrients takes place when warm water is transferred to the bottom from the surface and the nutrient-rich cold water is circulated to the surface.

Q. 4. A. Look at the map of ocean currents and answer the following:

How does the Humboldt current affect the climate of the South American coast?

Answer : Ocean currents are the horizontal continuous flow of a mass of water from one place to another. They are of 2 types – warm and cold ocean current. Ocean currents flowing along the coastline have an impact on its climate. Humboldt current is a cold ocean current flowing towards the north along the west coast of South America from the southern part of Chile to northern Peru. Thus, it brings cold water into warm water areas of northern Peru having a cooling influence in the climates of these regions. There is also dryness in the region due to cold current because cool marine air has low moisture holding capacity causing little or no precipitation.

Q. 4. B. Look at the map of ocean currents and answer the following:

In which oceans are counter equatorial currents not observed and why?

Answer : Counter equatorial currents are an eastward flow of oceanic water near the equator due to the impact of trade winds or easterlies. The pattern of these ocean currents is prominent in Pacific and Atlantic Ocean but different in Indian ocean due to monsoon. The prevalence of monsoonal winds in the Indian Ocean region has a considerable impact on the direction of ocean currents. The ocean current flows in the clockwise direction in summer in the northern part of the Indian ocean while in winter they flow in the opposite direction due to the reversal of monsoon winds.

Q. 4. C. Look at the map of ocean currents and answer the following:

Which currents are absent in northern part of the Indian Ocean and why?

Answer : Ocean currents are the horizontal continuous flow of a mass of water from one place to another. They are of 2 types – warm and cold ocean current. The cold currents are absent in the northern part of the Indian Ocean. Cold ocean current flows from polar region to equator. The Indian Ocean is land-locked in the North. Hence, no cold current can enter the north part of the Indian ocean.

Q. 4. D. Look at the map of ocean currents and answer the following:

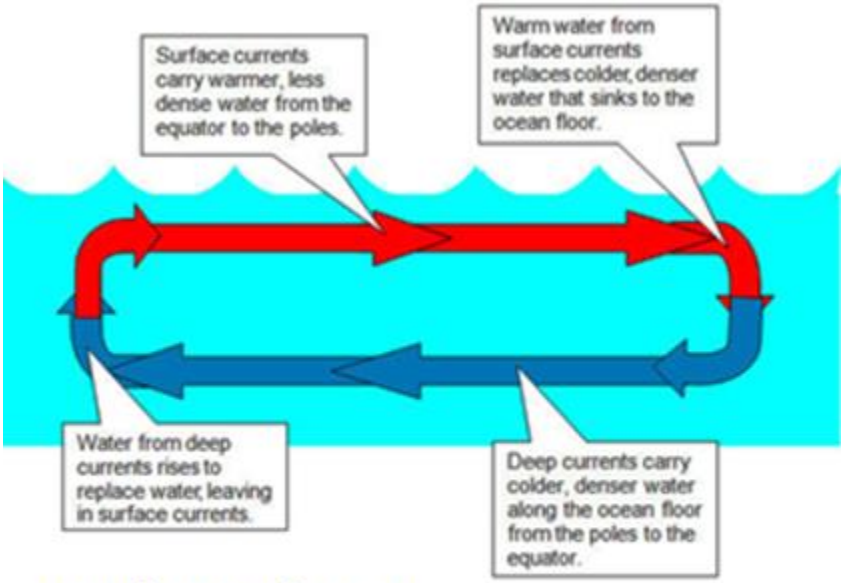
In which regions do the cold and warm ocean currents meet?

Answer : Ocean currents are the horizontal continuous flow of a mass of water from one place to another. They are of 2 types – warm and cold ocean current. The meeting of cold and warm currents results in the formation of thick fog. Labrador Current meets the Gulf Stream off the coast of Newfoundland. The regions where warm and cold ocean currents meet are also rich in fishing grounds. Example: Grand Bank near the North American coast in the Atlantic Ocean and Dogger Bank near the European coast.

Q. 5. A. Answer the following questions:

What are the reasons responsible for the formation of deep ocean currents?

Answer : Deep ocean currents are those water currents which flow beyond the depth of 500m. They constitute about 90% of the ocean water. They are driven by density and temperature gradients. This is also known as thermohaline circulation. The difference in temperatures of various parts of the ocean results into formation of the deep-sea currents. Warm water that has lower density comes to the surface of the sea while the Coldwater with high density goes down.



Circulation of ocean currents

Q. 5. B. Answer the following questions:

What is the reason behind the dynamics of the ocean water?

Answer : Ocean water is not still. There is continuous vertical and horizontal movement of water. The horizontal continuous flow of a mass of water from one place to another gives rise to an ocean current. Many factors are responsible for this movement of water. They are driven by density, temperature gradients, planetary winds etc. Due to uneven heating of the earth, surplus heat is accumulated at the equator which is then transferred to poles through ocean currents. The direction of flow of ocean current is also dependent on the continental structure and the rotation of the earth. The shape and position of coastline play a crucial role in guiding the direction of ocean currents. The rotation of earth results in ocean currents to move in the clockwise direction in the northern hemisphere and anti-clockwise in the southern hemisphere.

Q. 5. C. Answer the following questions:

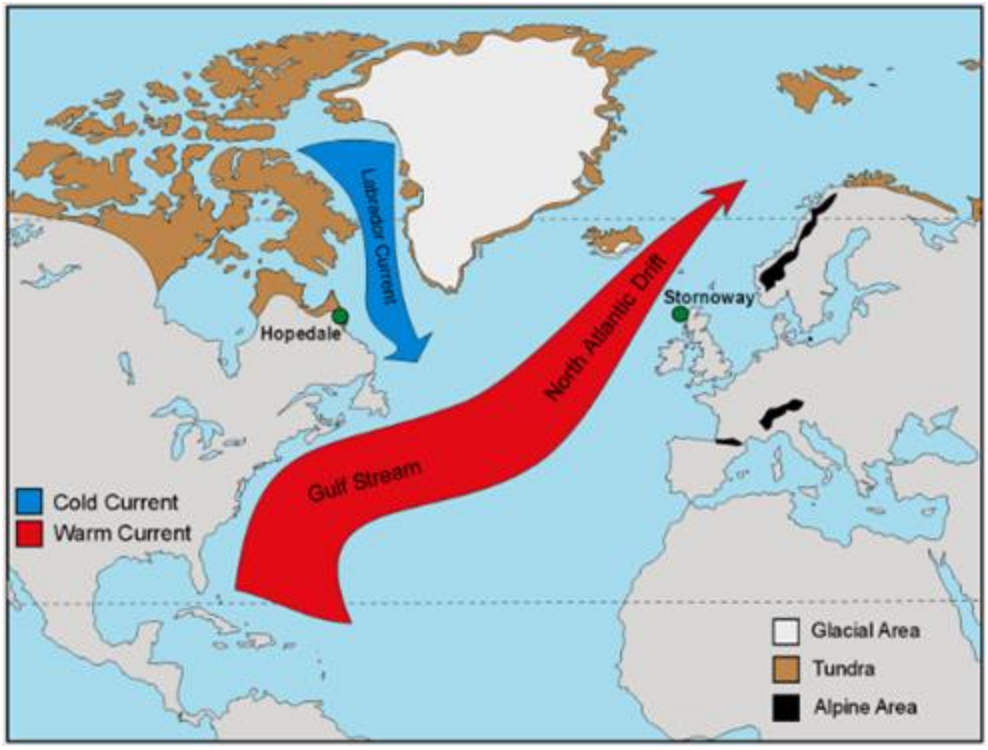
How do winds give direction to the ocean currents?

Answer : Ocean currents are the horizontal continuous flow of a mass of water from one place to another. The planetary winds are one of the factors responsible for the movement and direction of ocean current. These currents are pushed to long distances due to the wind. The direction of ocean currents in mid-latitudes is determined by westerlies. As a result, ocean current at mid-latitude flows from west to east. Similarly, the ocean currents near the equator flow from east to west under the influence of trade winds.

Q. 5. D. Answer the following questions:

Why do the ports in the eastern coast of Canada freeze in winter?

Answer : Ocean currents are the horizontal continuous flow of a mass of water from one place to another. They are of 2 types – warm and cold ocean current. Ocean currents flowing along the coastline have an impact on its climate. Labrador is cold oceanic current originating in Arctic Ocean and flowing south along the coast of Labrador, Canada. Thus, these waters are cold and tend to freeze up the ports early in the winter.



Activity

Q. 1. Look for more funny and interesting information related to ocean currents.

Answer : Ocean currents are driven by wind, water density differences, and tides. They are very important in determining the climates of the continents, especially those regions bordering on the ocean. Currents are also important for marine life because they transport creatures around the world and affect the water temperature in ecosystems. Types of ocean currents:

1. Surface water currents

2. Deep water currents

3. Tidal currents

4. Coastal currents.

Intext Questions

Q. 1. When does any material flow?

Answer : Materials can flow in any number of ways. The flow and motion of materials, especially liquids is dealt in classical physics through quantum mechanics or relativity. The study of liquids comes under fluid dynamics which is again divided into hydrodynamics (flow of water) and aerodynamics (flow of air).

Fluids consist of both liquids and gaseous components as they constantly change shape when a force is exerted on them. Gases are compressible as they can either spread out or compress to fill in the volume of space available. But liquids are non-compressible as they do not compress or spread out and fill the volume of space completely.

Most of the materials flow because its particles and molecules do not form a rigid and definite arrangement at normal temperature and pressure. Changes in temperature and pressure can be the main reasons for the flow of materials. Liquids flow but stay together in the same form and shape because of the existence of attraction between the molecules and particles. Since these attractions are weak in liquids, there is greater space between the particles. Thus they flow with changes in temperature and pressure. In the case of most gaseous components, flow and movement occur due to the pressure difference. When there is a region of high pressure (more molecules and particles at a lesser space), they attempt to break free and move to a region with low pressure (fewer particles and molecules). This difference in pressure is the basis of the movement of gaseous components.

Q. 2. What happens exactly when it flows?

Answer : The flow of materials can be through gaseous components or liquid components. The flow of materials in any particular direction can lead to the formation of currents in the region. In the case of liquids, the material flow can result in the formation of ocean currents and waves in the seas and oceans. This can have far-reaching impacts on the ecological system. They contribute to cloud formation and development of rainfall in many regions. They are also responsible for the formation of various structures like rocks and cliffs on the ocean floor.

The flow and circulation of gaseous particles and materials also have implications in the ecological system. The flow of air and other gaseous and particulate matter through the atmosphere determines the level of temperature, pressure, and humidity of the atmosphere. It also plays an important role in the formation of low-pressure and high-pressure networks throughout the atmosphere and influences the weather and climate in any region.

Thus, the flow of materials affects the temperature, pressure, humidity, weather, climate and other geographical factors in any region.

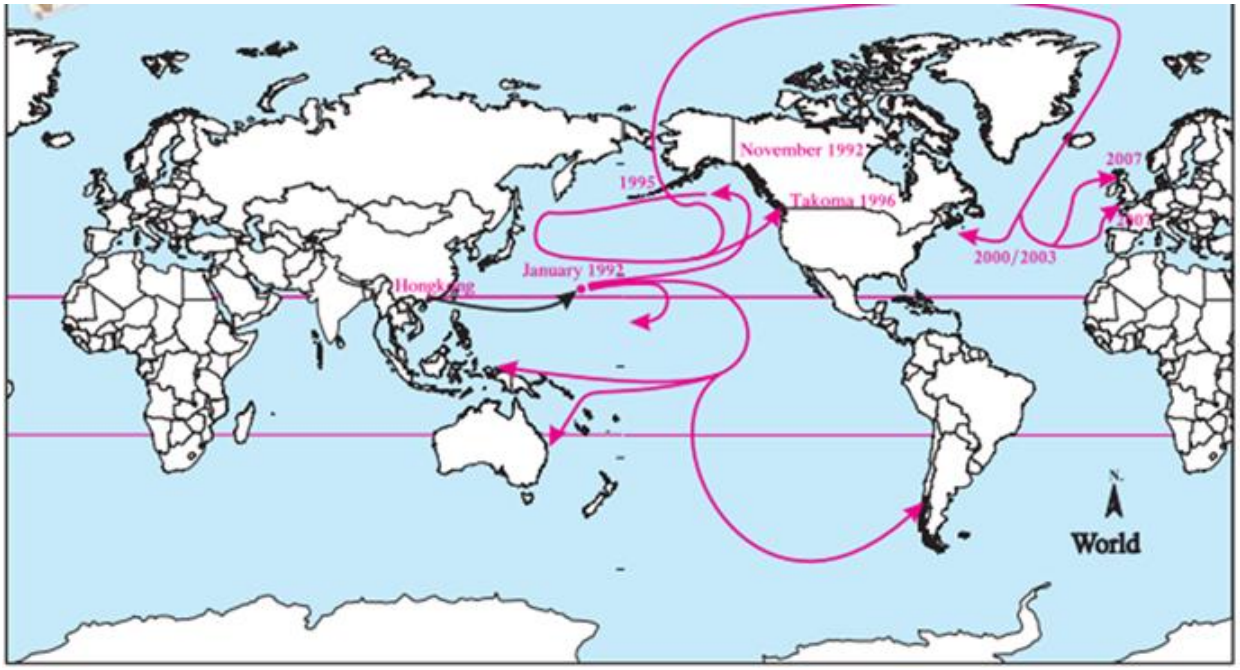
Q. 3. Which anomalies in the material is responsible for the initiation of the flow?

Answer : Materials can flow in any number of ways. The flow and motion of materials, especially liquids is dealt in classical physics through quantum mechanics or relativity. The study of liquids comes under fluid dynamics which is again divided into hydrodynamics (flow of water) and aerodynamics (flow of air).

Fluids consist of both liquids and gaseous components as they constantly change shape when a force is exerted on them. Gases are compressible as they can either spread out or compress to fill in the volume of space available. But liquids are non-compressible as they do not compress or spread out and fill the volume of space completely. Most of the materials flow because its particles and molecules do not form a rigid and definite arrangement at normal temperature and pressure.

This is the basic property of materials that allow it to flow as against the solids where the particles and molecules are strongly and rigidly bounded together.

Q. 4. A very strange incident occurred in the Pacific Ocean in the year 1992. A cargo ship sailed towards America from Hong Kong. While travelling through the Pacific Ocean, near the Hawaii Islands, a container full of toys fell into the ocean and broke. Around 28000 rubber toys started floating on the ocean. This incident occurred on 10th January 1992. Now a strange thing happened. After around 10 months, on 16th November 1992, some of these toys reached the coast of Alaska. Some of them crossed the Bering Strait and moved up to the Arctic Ocean by the year 2000. Some of them also floated to the Atlantic Ocean from the Arctic. Some of these reached the eastern coast of America in 2003 and some of the toys had even reached the European coast by 2007. From the Hawaii Islands, some toys took the route to Australia! See figure 5.2 and 5.3. Why did the toys travel in this way?



Answer : The toys travelled in this pattern because of the movement of ocean currents. Ocean current is a permanent and continuous movement of water in the earth's oceans. The ocean water consists of two layers- surface water and deep sea. The surface currents and surface circulation account for only 10% of the movement in oceans. It is the deep water circulation that constitutes for the rest 90% of the movements in the oceans.

Ocean currents can either be towards the north or towards the south. They flow from the equator towards the poles or from the poles towards the equator. The currents from the poles are generally cooler, while the equator has warmer currents. The ocean can also have massive loops of water, generally called as gyres. They are generally found in the Pacific Ocean, the Atlantic Ocean, and the Indian Ocean.

The tides, gyres, and waves superimposed on the ocean currents are responsible for the movement of water and the toys in a circulating manner.

Land Use

Exercise

Q. 1. A. Examine the statements and correct the incorrect ones.

Mining is not a type of land use.

Answer : This statement is false. Mining falls under the category of rural land use. There are many agro-based activities prevalent in a rural area. Such as fishing, agriculture, forestry etc. Mining is also an example of rural land use. The miner usually prefers to reside in areas closer to the mines.

Q. 1. B. Examine the statements and correct the incorrect ones.

There are factories in the Central Business District.

Answer : This statement is false. A Central Business District or CBD is the central place of an urban area that has the maximum land concentration for commercial purpose, For example, banks and shops.

Q. 1. C. Examine the statements and correct the incorrect ones.

In urban areas, the largest area is used for residential purposes.

Answer : This statement is true. In urban areas, there is a maximum concentration of population. People even migrate from nearby rural areas to urban areas in search of jobs and livelihood. So, the population is dense and a large part of the urban areas are denoted for residential purposes.

Q. 1. D. Examine the statements and correct the incorrect ones.

The village attendant issues the 7/12 extract.

Answer : This statement is false. 7/12 extract is issued by the revenue department of the government. All the information about the land can be obtained from this department. It is recorded in the register of the revenue department. It includes details like the ownership of the land, status of land, transfer of ownership etc.

Q. 1. E. Examine the statements and correct the incorrect ones.

In rural areas, residential areas occupy large tracts.

Answer : This statement is false. In rural areas, the number of people residing is less. The space for settlement is more as compared to the population. So, the residential areas do not occupy large tracts. The people also prefer to reside near to their area of

work. Sucha s the miner prefer to reside near the mines and the fishermen prefer to reside near to the water bodies.

Q. 1. F. Examine the statements and correct the incorrect ones.

Extract 7 indicates Record of Rights.

Answer : This statement is true. Extract 7 includes detailed information about the owner of land and rights and liabilities of the landholder. Extract 7 and Extract 12 are combined to prepare the 7/12 extract.

Q. 1. B. Examine the statements and correct the incorrect ones.

Extract 12 indicates a change in ownership.

Answer : This statement is false. Extract 12 indicates information about the registration of crops, type of crop, fallow land etc.

Q. 2. A. Give geographical reasons.

Landuse for the public facility are extremely important in urban areas.

Answer : Land use is the function or functions that a man applies to the land available to him. The interaction between geographical factors and man have resulted in land use. There are some essential public service facilities like hospitals, schools, police stations, etc. which requires some land. The quality of life of citizens is dependent on the effectiveness of these public services. With the increasing urbanization, the provision of the public facilities becomes more important to cater to the large population which requires effective land use.

Q. 2. B. Give geographical reasons.

The record of the ownership of non-agricultural land is the same as that of the agricultural land.

Answer : The ownership of agricultural land is recorded in the Extract 7/12. It is the extract of the land records which is kept in the registers held by the public revenue department. It contains important details of the ownership rights of the family, the status of debts and loans, transfer of ownership and the area under different crops. This document is an important indicator of the legal status of a property. The ownership of a non-agricultural land is recorded in the property card. It is made available from the urban land records. It contains details of ownership rights, the area of the property, plot number, amount of tax, right to access etc. So, it is right said that the record of ownership of non-agricultural land is the same as that of the agricultural land.

Q. 2. C. Give geographical reasons.

A region can be classified as developed or developing on the basis of land use.

Answer : Land use is the function or functions that a man applies to the land available to him. The interaction between geographical factors and man have resulted in land use. The country's economic development determines the pattern of land use. Developed countries have high agricultural productivity, robust manufacturing sector compared to developing countries. Thus, developed countries tend to have a small proportion of land under agriculture and more under secondary and tertiary sector.

Q. 3. A. Write answers.

Why is agriculture important in rural land use?

Answer : Land use is the function or functions that a man applies to the land available to him. The interaction between geographical factors and man have resulted in land use. Agriculture is the main occupation in rural India. More than half of the country's workforce is dependent on agriculture. Thus, the land use for agriculture in rural India is very high. The livelihood of large sections of the society is dependent on the ownership of land and the availability of quality inputs. In 2011, 52.8% of land use in India was under agriculture. In rural areas, the land use under agriculture can be further categorized into arable land, fallow land, grassland or pastureland etc.

Q. 3. B. Write answers.

State the factors affecting land use.

Answer : Land use is the function or functions that a man applies to the land available to him. The interaction between geographical factors and man have resulted in land use. There are numerous factors affecting land use.

1) The regions rich with mineral resources are used for mining. For instance, states like Odisha, Jharkhand, Chhattisgarh have more land under mining compared to other states.

2) The pattern of land use is also determined by certain physical factors like topography, climate etc. For instance, the population density is less in mountainous regions compared to plains.

3) Government policies like the development of metro lines, dedicated freight corridors, bullet train project converts the land into transport land use.

4) The government has also announced several housing projects like Pradhan Mantri Awas Yojana, which promotes affordable housing for the weaker sections. Such projects convert land to residential land use.

5) It is also affected by the population, quality fo lands, and needs. For examples, in Japan. The percentage of land under forest is more as compared to the land used for agriculture purpose.

6) In urban areas, the number of people residing increases with the passage of time. People tend to migrate from other rural areas to these urban areas. So, a major portion of the land in urban areas is used for residential purpose.

Q. 3. C. Write answers.

Clarify the differences between rural and urban land uses.

Answer : Land use is the function or functions that a man applies to the land available to him. The interaction between geographical factors and man have resulted in land use. In rural areas, primary activities like agriculture, fishing, and mining are predominant. Hence, a large amount of land is used for such activities. In rural areas, the land use under agriculture can be further categorized into arable land, fallow land, grassland or pastureland etc. The population density of rural areas is low compared to urban areas. In urban areas, with growing migration from rural areas, the number of urban settlements are growing at an exponential rate. The land in urban areas is used for commercial purposes, residential use, public utility provision, recreational land use in the form of parks and malls etc.

Q. 3. D. Write answers.

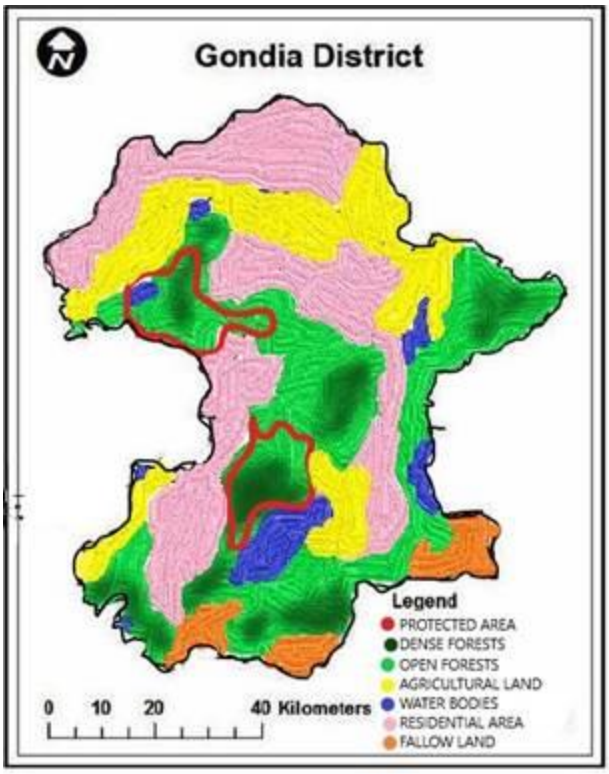
Differentiate between 7/12 extract and property card.

Answer : Both 7/12 extract and property card are used to get the required information about the registered land. 7/12 Extract is the extract from the land records registers held by the public revenue department. It contains important details of the ownership rights of the family, the status of debts and loans, transfer of ownership and the area under different crops. This document is an important indicator of the legal status of property (agriculture land). When the land property is located in an urban area the details of the ownership of such property, survey number, plot number etc, are recorded in the property card, available from urban land records.

Intext Questions

Q. 1. Take a map of your surrounding area and using different colours, show the land use of your area.

Answer :



Gondia district is in the state of Maharashtra. It is also called as rice city due to the abundance of rice mills in the area.

Q. 2. If the land is left fallow or is not in use, then can it be termed as a kind of land use?

Answer : Land use is the purpose or way in which a particular stretch of land is used. It is the modification and changes that are brought into the natural environment for the development of built environment, settlements, agriculture or management of forests. It determines that pattern in which the land is used.

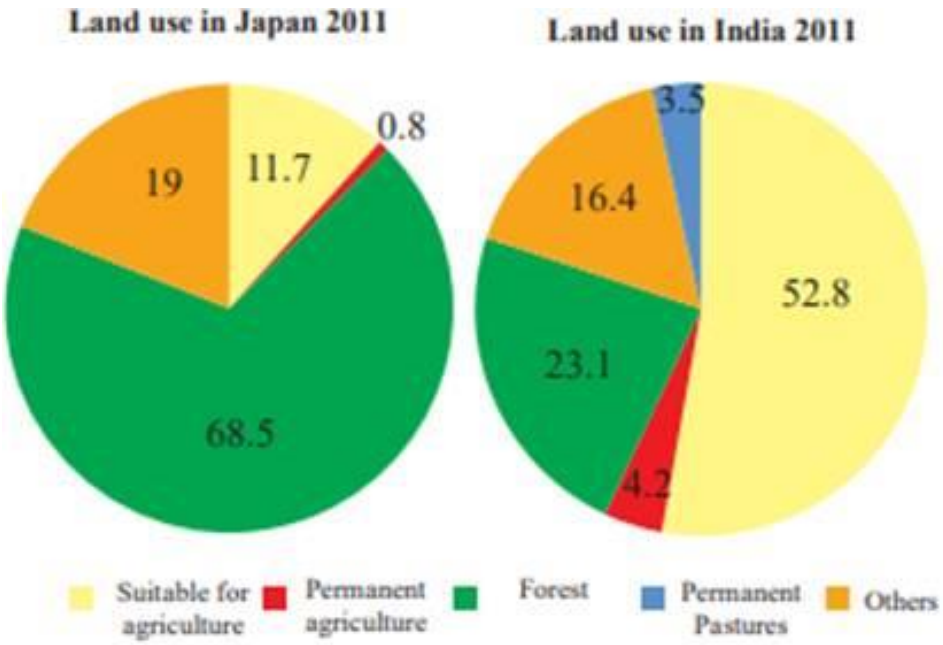
Fallow lands are those lands that are left barren to improve the physical features and fertility of the soil for some seasons. The farmers leave a part of their land that they cultivate s barren to allow the soil to regain its nutrients. This is the agricultural land that is not temporarily cultivated. Sometimes, the land is permanently left barren if it is unfit for cultivation. Thus, if a particular stretch of land is left fallow, it cannot be termed as land use as the land is not being used for any purpose. The future potential use of the land is also uncertain. Thus, leaving land fallow cannot be termed as land use.

Q. 3. Can you tell which area the property is located?

Answer : The property is located in the Parner taluka of Ahmednagar district in Maharashtra. It can be understood from the ownership documents issued by the

Revenue Department. It is available with the village office for the purpose of land analysis and revenue collection.

Q. 4. Examine the pie charts showing land use in figure 6.1 and answer the following questions:



a. In which country is the land under forests more?

b. In which country is the land under agriculture more?

c. Considering the two questions above, how will you relate the physiography and climate of India and Japan with their respective land uses?

Answer : a. The land under forests is more in Japan as compared to India according to the land use data of 2011. Japan has 68.5% of its area under forests, while in India it is just 23.1%.

b. The land under cultivation and agriculture is more in India. It accounts for 4.2% in India while the area under cultivation is just 0.8% in Japan. As compared to Japan, the total area that is suitable for agriculture is also more in India. It accounts for 52.8% in India, while in Japan it is just 11.7%.

c. The land use in different countries differs according to their circumstances, situations and needs of the people. Japan has more forest cover, while India has more agricultural land. While comparing the total land area, India is nearly 8 times larger than Japan. Most of the land area in India is also suitable for cultivation. With the growing population in India, the demand for an increase in the area under cultivation is rising. Thus more land has to be brought under cultivation in the case of India. Also, India is well-endowed

with the natural resources and the climate that gives the country an edge in increasing its agricultural productivity. But Japan with limited land availability and negligible resources lacks the potential to increase its agricultural productivity. Still, the island country has achieved development in many other fields.

Q. 6. Give the answers on the basis of figure 6.4

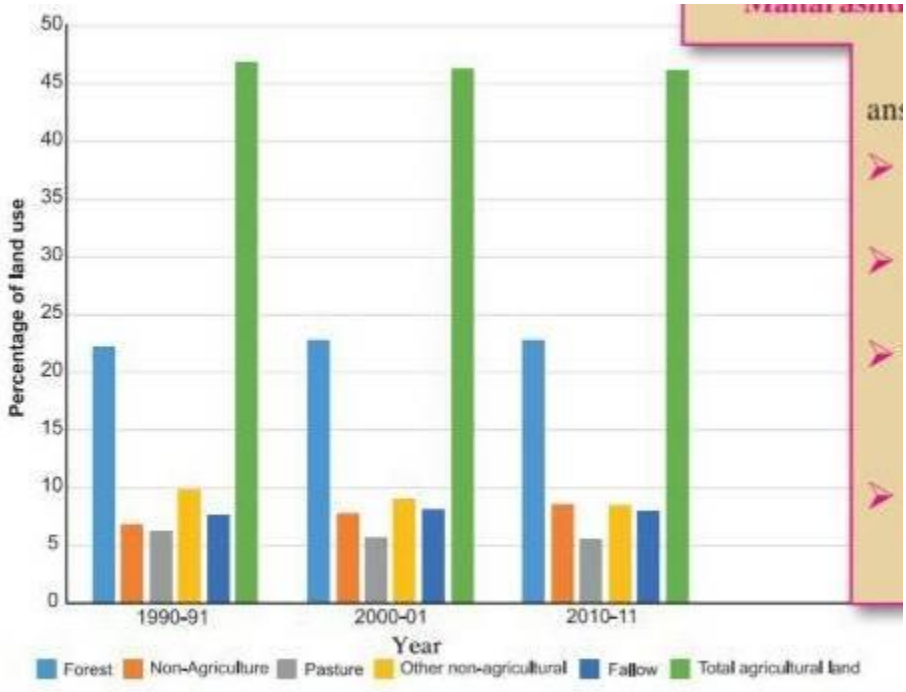


Figure 6.4 : General land use and its changes in India (1990-2011)

a. Which are the land uses of 1990-91 that show a decline in 2010-11? What could be reasons for this?

b. Which type of land use is maximum? What would be the impact of this on India's environment?

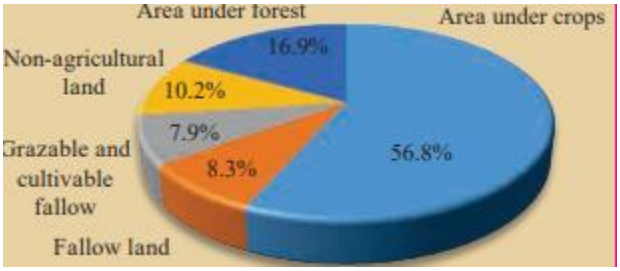
c. Can a decline in the area under agriculture be equated with a food shortage?

Answer : a. Pastures and other non-agricultural land have shown a decline comparing the land use in 1990-91 with 2010-11. With the growing population in India, the demand for an increase in the area under cultivation is rising. Thus more land has to be brought under cultivation in the case of India. India is well-endowed with the natural resources and the climate that gives the country an edge in increasing its agricultural productivity. Also, the demands of the increasing population have resulted in the conversion of such areas to other residential and community areas. This describes the increase in non-agricultural areas in 2010-11.

b. In all the three years of 1990-91, 2000-01 and 2010-11, the maximum land use shown is the agricultural area. With the growing population in India, the demand for an increase in the area under cultivation is rising. Thus more land has to be brought under cultivation in the case of India. Also, India is well-endowed with the natural resources and the climate that gives the country an edge in increasing its agricultural productivity. But this can have serious environmental impacts. The indiscriminate clearing of pastures and other areas for agricultural purposes can affect the ecosystem in which we survive. It can lead to the endangering and the extinction of many flora and fauna and ultimately a threat to ourselves.

c. The decline is agricultural area can be equated with a food shortage. With the growing population in India, the demand for the increase in the area under cultivation is rising. In such a situation, if the area under cultivation falls, then it can lead to food shortages to feed the increasing populace. Even though imports of food grains can be done, it will raise the import bills and also will not enable the country to achieve self-sufficiency in food production.

Q. 7. Study the given figure and answer the following questions.



Maharashtra State Land use 2010-11

a. What is the percentage of land suitable for cultivation?

b. What is the percentage of barren land?

c. What is the percentage of land under forest in Maharashtra?

d. What is the percentage of non-agricultural land in Maharashtra?

Answer : a. The total percentage of land that is suitable for cultivation includes the area that is under cultivation that accounts for 56.8% and the grazable and cultivable fallow that accounts for 7.9%. Thus, the total percentage of land suitable for cultivation is 64.7%.

b. The total barren land includes the permanent fallow land that accounts for 8.3% and the grazable and cultivable fallow that is left barren temporarily that is 7.9%. Thus the total of barren land is 16.2%.

c. Maharashtra has nearly 16.9% of its total area under forests. It is in the fourth position among the state with the highest forest cover.

d. Non-agricultural land constitutes for 10.2% of the total land area of Maharashtra.

Q. 8. The figure shows the satellite images of Mondha Village, Nagpur. Find out the changes in land use pattern and write a note.

2003

2010

2017

Answer : All the three images clearly illustrate the changes in land use pattern that has occurred in the village over the time span of years. Land use is the purpose or way in which a particular stretch of land is used. It is the modification and changes that are brought into the natural environment for the development of built environment, settlements, agriculture or management of forests. It determines that pattern in which the land is used.

The image of 2003 shows the abundance of agricultural fields, pastoral lands, and areas with dense flora growth. The built infrastructure is negligible in the time with no visible building and other structures. With the passage of time, the agricultural fields and pastoral areas have paved the way for the development of built infrastructure in the region. In 2007, a bulk of densely forested area had been cleared, and buildings have come up in the place. But the changes in agricultural fields is negligible. But in 2017, most of the agricultural areas have also been cleared. The area has lost its green cover, and the buildings and other structures are clearly visible. Thus the images show the transition of an area with the changes in the demands of the populace.

With the growing population in India, the demand for the increase in the area under cultivation is rising. Thus more land has to be brought under cultivation in the case of India. India is well-endowed with the natural resources and the climate that gives the country an edge in increasing its agricultural productivity. Also, the demands of the increasing population have resulted in the conversion of such areas to other residential and community areas. But this can have serious environmental impacts. The indiscriminate clearing of pastures and other areas for agricultural purposes can affect the ecosystem in which we survive. It can lead to the endangering and the extinction of many flora and fauna and ultimately a threat to ourselves.

Population

Exercise

Q. 1. A. Complete the following sentences.

If the birth rate is greater than the death rate then the population _____.

A. Decreases

B. Increases

C. remains constant

D. becomes surplus

Answer : Birth rate: The number of infants born per thousand of the population a year is known as birth rate.

Death rate: the number of deaths per thousand of the population a year is known as the death rate.

When the birth rate is greater than death rates, the population increases by increasing the number newly born infants.

Q. 1. B. Complete the following sentences.

People of _____ age group are included in the productive population.

A. 0 to 14

B. 14 to 60

C. 15 to 60

D. 16 to 59

Answer : The age group of 15-60 are economically productive and biologically reproductive. They comprise the working population.

Q. 1. C. Complete the following sentences.

The spread of modern technology in society is mostly dependent on _____.

A. Sex Ratio

B. Birth Rate

C. Literacy

D. Migration

Answer : When there is an increase in literacy of the community then there will be an increase in the development of techniques. Therefore the technological development takes place.

Q. 2. A. Examine the following statements and correct the incorrect ones.

The population density of a region can be understood from its area.

Answer : Population density means the ratio between the population in the area and size of the area. Therefore the given statement is correct we can understand the density by its area.

Q. 2. B. Examine the following statements and correct the incorrect ones.

The quality of the population is determined on the basis of literacy.

Answer : The population quality cannot be determined by the literacy alone. It needs further social indicators such as birth rate, death rate, infant mortality rate, etc. Therefore the population quality can be determined by the cleanliness, hygiene and health condition of the economy.

Q. 2. C. Examine the following statements and correct the incorrect ones.

There is an adverse impact on manpower in the regions of out-migration.

Answer : Migration is the movement of people from one place to another. In most cases, migration happens in search of employment opportunities. Thus, there will be an adverse impact on the manpower in the region of out-migration. Thus the statement is correct.

Q. 2. D. Examine the following statements and correct the incorrect ones.

Greater economic prosperity indicates the development of a region.

Answer : Economic prosperity alone cannot indicate the development of a region. It is the GDP and other social indicators that will indicate the development of a region. Therefore the GDP of the region and other social, as well as economic indicators such as literacy, birth, death, health, etc., will indicate the development of the region.

Q. 2. E. Examine the following statements and correct the incorrect ones.

Developing countries have an HDI of 1.

Answer : No, the developing countries will not have the HDI value of 1. The HDI value is indicated to show the development score of the economy. HDI value of 0-0.5 underdeveloped countries, 0.5-0.8 developing countries, and 0.8-1 developed countries. Therefore developing countries will have HDI value between 0.5-0.8.

Q. 3. B. Answer in brief.

Prepare a list of advantageous and disadvantageous factors, affecting population distribution.

Answer : Population distribution refers to the way in which people are spread over the earth's surface. 90% of the population live in 10% of land area in the world.

Disadvantageous factors

• **Climate**

An extreme climate such very hot and very cold makes uncomfortable for the human habitation. Hilly regions make harsh climate for transportation and network facility which will make very difficult to make human habitation in such places.

• **Soil**

People prefer the fertility of soil before the habitation. Fertile soils are significant for agricultural and associated activities. Therefore people will not prefer soil which is not fertile.

• **Water**

Water is the most important factor in life. People have a preference over the places where there is fresh water availability. Then the regions like deserts and barren land will not be preferred by the habitats.

Advantageous factors

• **Urbanization**

Urbanization makes a favourable condition for the people because of technological development in urban areas. This technological development will attract people to employment opportunities, better education, health care, etc.

• **Industrialization**

Industrial belts offer job opportunities and magnetize large numbers of people. These comprise not just industrial unit workers but also transport operators, shopkeepers, bank employees, doctors, teachers, and other service providers.

Q. 3. C. Answer in brief.

What are the problems in areas of high population densities?

Answer : Population density is the number of people per square kilometre. It is calculated as the number of people per unit area. India is one of the densely populated countries in the world. The problem due to high population density are:

• Lack of open space

High population makes very difficult to get a free space for a new habitat. There will be no rooms or houses or land left for the people.

• Pollution

Pollution is the main social problem faced due to the areas which have high population densities. There will be an increase in land degradation by building houses and flats which makes land pollution, water contamination by a huge volume of people makes water pollution, and massive usage of vehicles will contribute to air pollution.

• Lacks storage of water facility

These areas will lack the storage facility for water because of high density. The higher population needs more amount of water and storage capacity which lacks in these areas.

• Overcrowded

The areas with high population are overcrowded which makes the atmosphere polluted and lacks peacefulness. The environment gets damaged due to the over crowdedness.

Q. 3. D. Answer in brief.

What are the problems in the area of low population densities?

Answer : • Lack of technological advancement

The area with low population density will have the problem of technological advancement. Since there will be less or no human interference there lacks the new technological advancements.

• Low level of agricultural production

The land will be less fertile because of less human interactions. Even if the land is fertile, there will less production because of lack of human inhabitants.

• Low-level of the transportation facility

There will be less transportation and communication facility in these regions. These developments will not take place because of less population density.

Q. 4. A. Give Geographical Reasons.

The population is an important resource.

Answer : The population is an important resource because it provides human capital for the development of the country. The development of the country depends on the population because when there is a higher number of working population, then there will development simultaneously. Higher the population higher will be chances of having larger human resource. Therefore, the development of the human resource will increase in both skilled and unskilled labour. This increase in both the type of labourers will develop the nation in all the spheres such as economically, politically and socially. Even the dependent population such as students and children will contribute to the development of the economy. Hence the population is considered an important human resource in the world.

Q. 4. B. Give Geographical Reasons.

Productive population is an important group.

Answer : Among the population group, the productive population is important because they are the group who contribute very much to the development of the country. Human resource is the basis for economic growth. Even in the high-income economies, the economic growth is very low because of the low working population. When there is a low working population, the productivity of the economy decreases even though the income for the labourers is very high. A growing working population leads to a rise in total output. The pure arithmetical increase in population creates work as well as incentives for production that impacts upon output and productivity quite positively. An increasing productive population means an increasing market for most goods and services, and we know that the partition of labour is restricted by the extent of the market. A potentially escalating market may motivate entrepreneurs to invest more and more capital in goods and machinery. Business activity will be spurred as a result, and more income and employment will be produced in the process.

Q. 4. C. Give Geographical Reasons.

The study of age structures is important.

Answer : The study of age structure plays a very important role in the demographic statistics. The study of age structure indices helps to plan for the development of the economic and cultural life of the society. This study helps the planning agencies of the country to make the investment in the country according to the needs of the society; when the economy is mostly dependent population, then the investment should be made to the welfare activities such as old age pension, scholarship, etc. Whereas when there is more is more working population the investment made should be for the employment generation.

Q. 4. D. Give Geographical Reasons.

Literacy is directly related to development.

Answer : Literacy is an important tool which makes the work of the productive population most efficient. The impact of literacy on economic development is positive. The literate person makes technological developments to overcome the problems in the economy such as pollution, urbanization, and etc. their needs technical experts for ensuring sustainable development.

Q. 4. E. Give Geographical Reasons.

The real progress of a country is understood with the help of the Human Development Index.

Answer : The level of human development is ranked through scores of the Human Development Index (HDI) which varies between 0-1. In the HDI score, 0 states least developed state and 1 states highly developed state. It shows the real progress of the country because the indicators used to calculate the index are income, health, and education which are the most relevant factors in the country. When HDI value is higher, then the standard of living will also be higher which will make real progress in the country.

Q. 5. A. Write notes.

Sex ratio

Answer : Sex ratio is defined as the number of females per thousand males in the population. This is a social indicator which measures the extent of equality between the male and female in society. The sex ratio in India is unfavourable with 948 females per 1000 thousand males. The state Kerala has a sex ratio of 1058 females per 1000 males; Pondicherry has 1001 females per 1000 males while Delhi has only 821 females per 1000 males.

Q. 5. B. Write notes.

Age structure

Answer : Age structure of a population refers to the number of people in different age groups in a country. It is one of the basic characteristics of a population. The age classification makes a clear picture of the economical human resource in the country. The percentage of population under the age group of 15 years is considered as economically unproductive population. The percentage of population between 15-59 years is considered as economically productive population. The age group 59 years and above is mostly dependent population, and they are unproductive.

Q. 5. C. Write notes.

Literacy

Answer : Literacy is a very important quality of the population. Labour becomes skilled labour when they become literate or have some skills. Educated people indulge in many intelligent choices and undertake research and development activities. According to Census, a person who can read and write with understanding in any language is treated as literate. India has a literacy rate of 74.04%. In India, the state Kerala has the highest literacy rate with 93.91% as of 2018.

Activity

Q. 1. Survey 5 families in your neighbourhood on the basis of the following points and make a presentation.

a. Sex

b. Age group

c. Education

d. Occupation

Answer :

Families	Sex		Age group			
	Male	Female	0 - 14	14 - 30	30 - 60	60+
Family I	2	3	-	1	2	2
Family II	1	1	-	2	-	-
Family III	2	1	1	-	2	-
Family IV	2	2	-	2	2	-
Family V	1	4	-	2	2	1

Families	Educational qualification					Occupation	
	10^{th}	12^{th}	U.G	P.G	Professional course	Public sector	Private sector
Family I	1	2		1	1	1	1
Family II					2		2
Family III	1		1		1		1
Family IV		1	1	2		2	
Family V	1	1	1		2	1	1

I surveyed 5 families in my locality. The findings are presented in the above table:

• Family I- The family consists of 2 male and 3 female members. The elderly female member has completed her 10^{th} standard while her male counterpart has completed his 12^{th} grade. The child is in the age group of 14-30 has completed his 12^{th} standard. The working members of the family have completed their higher studies. The male member has completed his Post-Graduation and is working as a teacher in the government school. The female member has done a professional course and is working in a private firm.

• Family II- The family consists of a male and a female member. Both are in the age group of 14-30 has completed professional courses. Both of them are working in a private firm.

• Family III- The family consists of 2 male and a female member. The child in the age group of 14-30 has completed his 10th standard. The working members of the family have completed their higher studies. The male member has completed his professional course and is working in a private firm. The female member has completed her graduation and is the homemaker.

• Family IV- The family consists of 2 male and 2 female members. Both the children are in the age group of 14-30. One has completed 12^{th} standard, and the other member has completed her graduation. The working members are in the age group of 30-60. Both have completed their Post-Graduation and are government employees.

• Family V- The family consists of a male and 4 female members. The elderly female member has completed her 12th standard. Both the children are in the age group of 14-30. One of them has completed her 10th standard, while the second child has completed her graduation. Both the working members have completed their studies. Both have completed professional courses. One of them is employed in the private sector while the other person is employed with the government.

Intext Questions

Q. 1.

Particulars	Change	A City	B City
Total Population in 2016		1,00,000	1,10,000
Total number of children born	+	2,000	2,750
Total number of deaths	-	1,500	2,200
People who have migrated from outside	+	23,000	15,000
People who have migrated out	-	2,000	5,000
Total Population in 2017		?	

• Which city has greater number of newly born children?
• Which city records greater number of deaths?
• Looking at the figures of in-migration and out-migration which city has received more migrants?
• Calculate the population of both the cities in 2017.
• After considering all the points, which city has recorded more growth of population in one year?
• The total numbers of births are given. What would be this figure per thousand population? What is the term for this?
• What would be the number of deaths per thousand populations? What is the term used for this?

Answer : • From the above data given, City B has got 2,750 of total newborn whereas city A has only got 2,000 of total newborn. Therefore, City B has got the greatest number of new born children.

• From the above data given, City B has got 2,200 total numbers of deaths whereas city A has only got 1,500 total numbers of deaths. Therefore, city B has got the greatest number of deaths.

• From the above data given, City A has received 23,000 in-migrants and city B has received 15,000 in-migrants. Therefore, city A has received more migrants.

• From the above data given, the total population of both the cities in2017 = total population of city A in 2017 + total population if city B in 2017.

Total population in city A in 2017 = total population in 2016 of city A + total number of newborn children of city A – a total number of deaths of city A+ People who have migrated from outside - People who have migrated out.

Total population in city A in 2017 = 100000+2000-1500+23000-2000

Total population in city A in 2017= 121500

Total population in city B in 2017= total population in 2016 of city B + the total number of newborn children of city B– total number of deaths of city B + People who have migrated from outside - People who have migrated out.

Total population in city B in 2017= 110000+2750-2200+15000-5000

Total population in city B in 2017= 120550

Therefore, the total population of both the cities in2017 = total population of city A in 2017 + total population if city B in 2017.

The total population of both the cities in2017 = 121500+120550

The total population of both the cities in2017 = 242050

• From the data given above, city A has recorded a growth of 121500 and city b has recorded a growth of 120550. Therefore, city A has recorded more growth population in one year.

• The number of births per thousand population = total number of births / total number of population *1000

The number of births per thousand population = 2000/100000*1000

The number of births per thousand population= 20

The term used for this called the birth rate.

• The number of deaths per thousand population= total number of deaths/ total number of population *1000

The number of deaths per thousand population= 1500/100000*1000

The number of deaths per thousand population= 15

The term used for this is the death rate.

Q. 2. Even though area wise Rajasthan is a large state, the population is less. Which geographical factors may be responsible for this?

Answer : Geographical factors such as climate and rainfall may be responsible for less population in Rajasthan. Rajasthan is a very dry state receiving less rainfall. This affects the agriculture and the livelihood of the people. The climate is dry and harsh. Therefore, even though Rajasthan is a large state the population is less.

Q. 3. Groups :

1.Male 2.Adoloscent3. Illiterate 4. Children 5. Unemployed 6. Infants 7. Literate 8.Rural 9.Working population 10. Urban 11. Female 12. Old 13. Young 14. Dependent population

15. Adult
Classify the above groups into the categories below Sex, Age, Rural, Urban, Literacy, Productive Population. The population can be subdivided as per the groups were given above. These subgroups and their relationship with one another is studied in the structure of the population.

Answer : On the basis of sex: Male, female

On the basis of age: children, infants, adult

On the basis of rural: illiterate

On the basis of urban: urban

On the basis of literacy: literate

On the basis of productive population: adolescents, old, dependent population, working population, young

Q. 4. Have a class discussion based on the following questions.

• How many people in your house are studying? What is their age?
• How many people in your house are working for a living? How old are they?
• Do your grandparents still work? What is their age?

Answer : • There are four people in my house who are studying and their ages are 14,23, 47 and 53 years.

• There are two people in my house who is working, and his age is 53 years.

• No, my grandparents are not working anymore because they are retired from their jobs. Their ages are 70 years and 75 years.

Q. 5. How do imbalanced sex ratios affect society?

What measures can be taken to strike a balance in the sex ratio?

Answer : • Imbalanced sex ratio occurs when the proportion of females is more than males, or the proportion of males is more than females due to migration. It can affect the birth rate of females and employment factor.

1. Measures such as encouraging the birth of girl child should be promoted.

2. The government should make sure that the ban on sex determination of the foetus is strictly implemented.

3. Strict actions should be taken against those involved in female infanticide and female foeticide.

Q. 6. Answer on basis of the given table.

Statistics 2010

Country	Percentage of the immigrant population
Afghanistan	0.14
Brazil	0.34
Kuwait	62.11
Bangladesh	0.73
Germany	12.31
Hongkong	42.59
Israel	37.87
India	0.52
Oman	24.46
Saudi Arabia	25.25
Great Britain	8.98
U S A	12.81

• Which countries have less than 10% migrant population?
• Which are the countries with a migrant population of between 10% to 20%?
• Which are the countries with a migrant population of more than 20%?
• Find the reason behind the migrant population of more than 20%.
• Draw two pie diagrams for any two countries.
• Have a discussion on migration and development.

Answer : • From the data given above,

Countries that have less than 10% migrant population:

1. Great Britain

2. India

3. Bangladesh

4. Brazil

5. Afghanistan

• From the data given above,

Countries that have a migrant population of between 10% to 20%:

1. Germany

2. USA

• From the data given above, Countries with a migrant population of more than 20% are as follows:

1. Kuwait

2. Hongkong

3. Israel

4. Oman

5. Saudi Arabia

• In some countries the migrant population is more due to the following reasons:

1. Job opportunities

2. Good business prospects

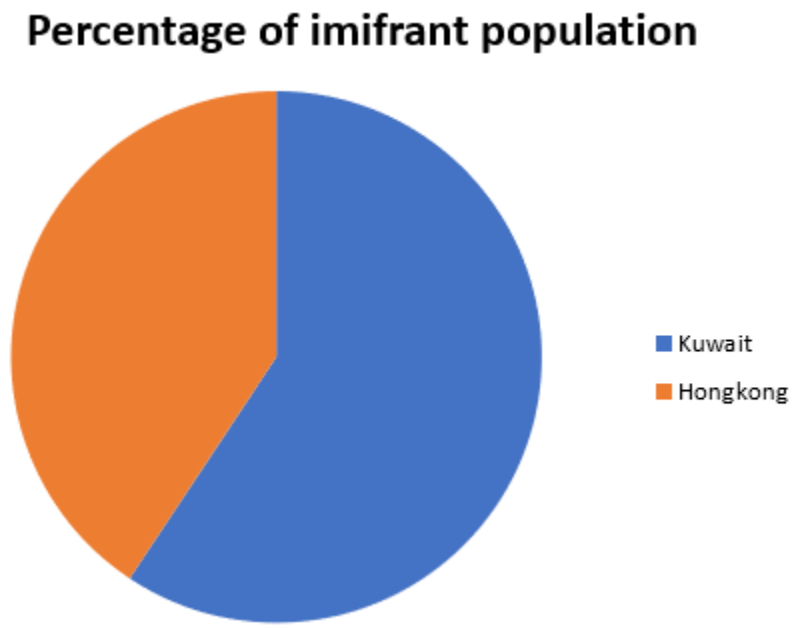
3. Better availability of natural resources

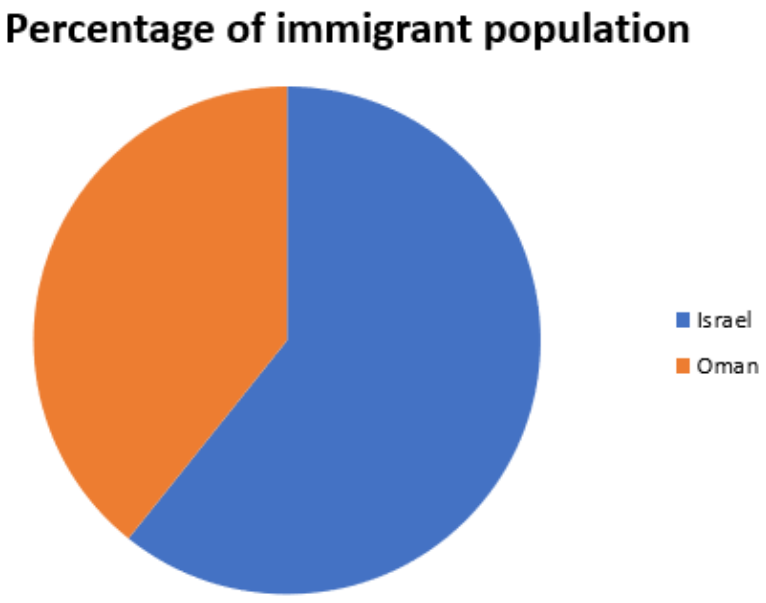
4. Steady economic development

5. Lifestyle

6. Good cost of living

7. Good currency exchange rates





• The movement of an individual or a group from one place to another is termed as migration. This could be for a short period, long period or permanently.

1. The reasons why people migrate are as follows: Marriage, education, business, transfer, tourism, natural calamities, wars, etc.

2. Due to migration the composition of the population also changes.

3. Places from where people migrate show a fall in population. Such places experience a shortage of manpower.

Migration and development take place side by side. Development is the process by which the nation improves its economic, social and financial wellbeing. Places which receive more migrants have a benefit of more manpower and working employs. This results in the development of that country.

Q. 7. Have a discussion on the basis of the following questions and answer the following.

• What would you call the people who work in the places mentioned below? farm, factory, hotel, hospital, shop, school, office

Answer : • People who work on the farm: farmers

People who work in hotel: chefs, waiters

People who work in hospitals: doctors, nurse, pharmacists

People who work in shops: shopkeepers

People who work in school: teachers

People who work in an office: engineers, accountants, clerks

Q. 8. Study fig 7.5 and answer the following questions.

• Which are the most densely populated districts?
• Name the sparsely populated districts with a density of less than 100 per sq. km.
• Name two districts with moderate population densities
• What is the density of the dark shaded regions?
• Why is the density of the population less in Gadchiroli?
• Have a discussion in the class on the effect of physiography, climate, the area under forest, industries, etc on the density of population.

Answer : • Palghar and Thane

• Gadchiroli

• Wardha, Yavatmal

• More than 1000 per sq. Km.

• The density of population is less in Gadchiroli because it is located in the eastern district and it is densely forested and rain shadowing.

• Referring to the fig. given above:

Effect of Industries: Higher density indicates urbanization and higher levels of industrialization. Therefore Mumbai city district and Mumbai suburb district, Thane, Pune, and Nagpur districts have a higher density.

Effect of the area under forest: The rain shadow districts as well as the districts in the extreme east which are densely forested show less density.

Effect of Physiographic: The reliefs and mountains determine the availability of natural resources

Effect of Climate: The climatic conditions of a place also determine the density of population.

Q. 9. Since the past two centuries, the size of a family is decreasing. But in spite of this, the population of the country is increasing. Find out why is this happening?

Answer : Since the past two centuries the size of the family is decreasing, but in spite of this, the population of the country is increasing due to in-migration and lack of population control.

Q. 10. Have a discussion on population control with the help of the following points

Public education

Education

Public awareness

Health facilities

Planning

Government policies

Research

Answer : Public education: By giving public education the population control can be achieved. It is very important for the public to be educated about the consequences of reproduction without planning. It is highly important for people to be aware of population control.

Education: Everyone should be given education regarding the importance of population control. It is essential to maintain population control for the betterment of the country and the family. It will help the nation and the people financially. Education will help them take responsible and sensible actions regarding population control.

Public awareness: Public awareness of the need for population control is highly essential. The public must be aware of the pros and cons of population control. Awareness must be spread regarding the need and how population control will lead to the betterment of the county.

Health facilities: Health facilities such as contraceptives and sex education must be provided for people to have a proper and correct understanding of reproduction. They should be taught about the importance and consequences of population control.

Planning: Proper planning steps must be taken to ensure population control. People should be taught about proper planning and the importance of it.

Government policies: Many government policies are introduced for the benefit of population control.

Research: A lot of researches are done regarding population control. Many products help in planning a child in the modern world.

Industries

Exercise

Q. 1. A. Mark (√) in the box next to the right alternative

Which factor amongst those mentioned below does not directly impact industrial development?

A. Water

B. Electricity

C. Labor

D. Air

Answer : Industrial development needs the main factor that is labour, water and electricity. Labour is the human capital involved in the process since humans are needed for the development of the industries. Air does not involve in any activity of the industrial process. Therefore, it has no impact on industrial development.

Q. 1. B. Mark (√) in the box next to the right alternative

Which of the following is a small industry?

A. Machine industry

B. Book binding industry

C. Silk industry

D. Sugar industry

Answer : Bookbinding industry is a small-scale industry among the following because it needs only minimum materials for setting up. The machines involved in the bookbinding industry does not cost much and needs minimum labour force to work.

Q. 1. C. Mark (√) in the box next to the right alternative

Which of the following cities is not an IT Centre?

A. Old Delhi

B. New Delhi

C. Noida

D. Bengaluru

Answer : Old Delhi is also Purani Dilli. The IT centre is situated in New Delhi, Noida and Bengaluru. Bangalore is also known as Silicon Valley of India because of having largest IT Park and is IT capital of India.

Q. 1. D. Mark (√) in the box next to the right alternative

An amount of 2% of the profits has to be utilized for which purpose by industries?

A. Income tax

B. Corporate Social Responsibility

C. Goods and Service tax

D. Sales Tax

Answer : As per the definition of OECD, Corporate responsibility involves the search for an effective 'fit' between businesses and the societies in which they operate. It is a company's sense of responsibility towards the community and environment (both ecological and social) in which it operates. A change in company law in India was made in April 2014; businesses with annual revenues of more than 10 billion rupees should give 2% of their net profit to charity.

Q. 2. A. State whether the following statements are true or false. Correct the incorrect statements.

Small and medium industries of the country are harmful to heavy industries.

Answer : False

Small and medium industry cannot be harmful to the heavy industry in a country. This is because the heavy industrial output will be larger and it grows faster than the small and medium industries due to huge investment and technological advancement.

Q. 2. B. State whether the following statements are true or false. Correct the incorrect statements.

The level of industrialization is an indicator of the economic development of a country.

Answer : True.

Level of industrialisation shows the level of economic development in the country. The higher the industrial development, higher employment opportunity, higher income, development in technology, etc. Therefore the industrial development reflects economic development in the country.

Q. 2. C. State whether the following statements are true or false. Correct the incorrect statements.

The aim of the industrial development corporation is to decentralize industrialization.

Answer : False

The main aim of industrial development is to bring out new innovations and technology. Industrial development never aims to decentralize the industrialization rather it tries to centralize the industrialization.

Q. 2. D. State whether the following statements are true or false. Correct the incorrect statements.

Corporate social responsibility is compulsory for every industrialist.

Answer : True

Yes, the corporate social responsibility is essential for the industrial unit. The law ensures 2% of the profit of the industrial unit must be contributed to society as a social responsibility. The industrial unit must ensure social responsibility in the society for the peaceful development of industries.

Q. 3. A. Answer the following questions in three to four lines.

What are the facilities provided by the government to industrial estates?

Answer : An industrial estate is a place where the essential facilities and factory accommodation are provided by the government to the entrepreneurs to set up their industries here. In India, industrial estates have been utilized as an efficient instrument for the support and growth of small-scale industries. The government provides infrastructure facility, low-interest loan for setting up, access to the raw material, etc.

Q. 3. B. Answer the following questions in three to four lines.

Write in your own words how industrial development impacts national development.

Answer : Industrial development impacts positively on the development of the economy. The industrial development will create more employment opportunity; when

there are more employment opportunities, then there will be an increase in the overall income of the people. This increase in income will increase the standard of living of the community. Also, there will be technological and scientific development in the country due to the development of industrial units.

Q. 3. C. Answer the following questions in three to four lines.

Give your opinion in short on the usefulness of Corporate Social Responsibility.

Answer : A corporation's community figure is at the mercy of its social responsibility programs and how conscious consumers are of this program. Corporations can develop their public image by supporting nonprofits through financial donations, volunteerism, in-kind contributions of products and services, and strong partnerships.

When companies contribute money to nonprofit organizations and promote their employees to volunteer their time, they reveal to investors that they don't just care about profits. And they attract many foreign investments to the company.

Apart from benefitting the company, it also helps in improving the conditions of the needy.

Q. 3. D. Answer the following questions in three to four lines.

Mention three features of small industries.

Answer : • Labour intensive

The unique feature of the small-scale industries is that it will be labour intensive industries. It involves the labour force in the local and makes them employed. Unemployed in the local areas will be employed and their income rises.

• Low cost

There will be only minimal cost for setting up these small industries. It doesn't involve any need for procurement of huge machines and factories. Therefore it requires a minimum cost for set up.

• Production

Since it is a small-scale industry and mainly uses labour intensive technique, then output produced will be less. Labour produce less output compared to a machine. Therefore the output will be less.

Q. 4. A. Write detailed answers to the following questions.

Explain the factors affecting industrial development.

Answer : Industrial development is essential for economic development. There are some factors which influence the industrial development, they are

• Government policies

Government policies have a very important role in influencing industrial development. When the country's economic policies are very rigid then setting up a new industry will be difficult. When the economic policies are very flexible, then the development of industries will be easier. Industrial development is very faster in China compared to India because of the economic policies.

• Labour

Cheap labour is another main factor for the industries. When there is cheap labour, it will reduce the cost of production. Low cost of production combined with higher will result in more profit thus leading to industrial development.

• Raw materials

The industry needs raw materials for the production process. The industries mainly locate in such a place that there will be easy access to the raw materials or make sure that there is adequate transportation facility to transport the raw materials.

Q. 4. B. Write detailed answers to the following questions.

State the advantages of the Maharashtra Industrial Development Corporation.

Answer : Maharashtra Industrial Development Corporation (MIDC) is a scheme of the government of Maharashtra and is the most important Corporation. It provides business with infrastructure and transportation facilities such as land, roads, water supply, drainage facilities and street lights.

• Many industrial hubs, IT corridors and airport have been developed through the MIDC.

• Steady growth

More development in industrial units will ensure more growth in the economy. The growth is ensured by emphasizing more employment opportunities in the state.

• More favourable for a business atmosphere

MIDC makes the state more favourable for industrial and business development. More business attracts the investment from foreign for starting a new industry and business.

Q. 4. C. Write detailed answers to the following questions.

Explain the importance of the IT Industry

Answer : Information technology (IT) is the use of computers to store, retain, transmit, and manipulate data, or information, often in the context of a business. The IT industry plays a vital role in the current world. Everything that we use now is connected to the internet and computers. IT is the development of modern science through computer gadgets. Importance of IT industry are:

• The huge volume of information

Because of the development of Information Technology, the internet came into picture which is useful in obtaining a huge volume of data within in the span of seconds.

• Storage of data

The computers and internet help in storage of massive data in small chip format or in the online form. This storage facility makes people less dependent on paper or books data.

• Development of education

The education system gets enhanced due to the development of the IT industry. Smart classes are being started in many schools due to the development of the IT industry.

• Business

It has a very important role in business and commerce also. The day to day activities in banks, business firms and other institutes are being run through the technological advancement of IT.

Q. 4. D. Write detailed answers to the following questions.

Considering India's population, the development of industries is a good solution to the problem of unemployment. Explain.

Answer : India apart from being highly populated country has massive unemployment and poverty. Industrial development will help to overcome the problem of unemployment. When the new industries are started, it needs huge land and labourers. For producing the output for industries, number labourers will be employed. These employed labourers will increase the employment status of the economy. The increase in employment will simultaneously increase the income of the people, then overall GDP of the economy increases. GDP is the national income of the country. When the GDP rises, there will be an increase in the standard of living of the people.

The standard of living ensures the rise in the development of the infrastructure, health, education and many other social factors. Therefore with a minimum effort of introducing

a new industry, there is a massive impact in the economy as a whole. Then, it can be said that the development of industries is a good solution to the problem of unemployment.

Q. 5. A. Prepare a flow chart for the following statements:

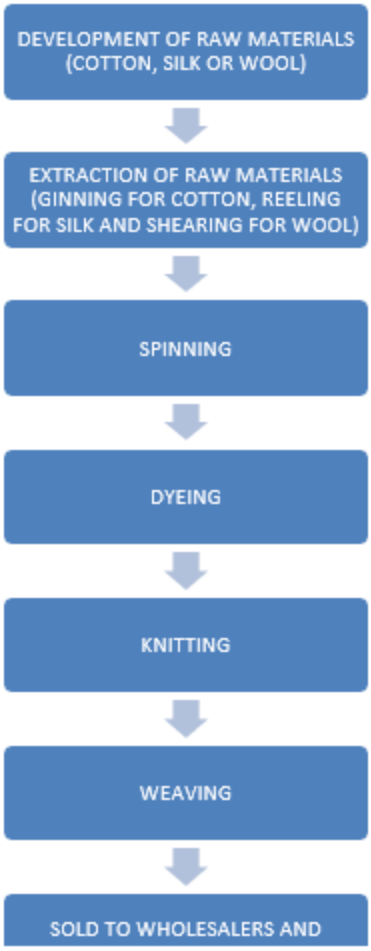
The journey of clothes that we use from the farm to ourselves.

Answer : The journey of cloth from farm to our hands can also be stated as its journey from to fibre to fabric. The journey of any cloth initially starts as a raw material. For instance, cotton comes from the cotton plants, silk from silkworms and wool from sheep/yak. These raw materials are allowed to grow and develop. Then they are extracted from their sources.

Cotton is grown from cotton seeds. It is harvested in the appropriate time, and the cotton fibre is separated from the seeds. The process is called ginning. In the case of silk, it is produced by the silkworms by feasting on the mulberry leaves. They weave a cocoon covering them which is boiled to separate silk from it. The process is called reeling of silk. Wool is extracted from the fur of sheep, goat or yak. Its fur is removed from the skin for the production of wool. This process is called shearing.

The subsequent steps involved in the processing of the fibre is similar for all kinds of fabrics. The fibres are spun together to form cloth threads. It can be done either manually or with machines. After spinning the clothes are dyed with the required colours. The threads are then knitted together to form cloth fabrics. This process is called weaving. This step converts the thread to fabric. Then the fabric is processed according to the requirements of the industries to different types of clothes. After the production is completed, they are sold to the wholesale and retail shops. From the shops, the clothes find their way towards buyers.

It can be represented by a flowchart-



Q. 5. B. Prepare a flow chart for the following statements:

Essential factors for the location of any one industry.

Answer : The location of industries is determined by various factors like the availability of raw materials, markets, labour, power and electricity and so on. The location of strategic and heavy industries such as the iron and steel industry is very important for the functioning of the economy. The factors determining the location of the industries can be explained by-

• Raw materials- The basic raw materials required in the industry are scrap iron ore, coal and limestone. The industries will be located in areas where these materials are available.

• Energy- Iron and steel industry is related mostly to the resources of coal. Thus it is located in places where coal reserves and electricity is abundantly available.

• Transportation- Transportation facilities is very important for the functioning of any industry. Since the bulk materials are to be transported to other places, the industry is located in the points where transportation facilities are available.

• Labor- The industry is located in places where the skilled, unskilled and technically qualified labour force is available.

• Water- It is mainly required for the manufacture, processing, cooling and cleaning of the plants used in production.

• Market- The industry is located nearer to the availability of markets for the commodity. It also makes the transportation of the commodity easier.

It can be explained with a flowchart-

Q. 6. A. Highlight the differences:

Medium industries and heavy industries

Answer :

Basis	Heavy industries	Medium industries
Cost	Heavy industries need huge capital investment. Therefore the cost of capital will be higher	Medium industries need only low capital investment. Then the cost of capital will lower.
Output	The production of output will higher. More output can be produced in these industries	The output production will be lower compared to heavy industries.
Labour involved	Labour involvement will be lower because of the use of machines in the industries.	There will be more labour involved because of lack of machinery and low investment.
Location	The location for the heavy industries situated according to the needs of the industries and it must near the raw materials	It doesn't need any specific location and condition.

Q. 6. B. Highlight the differences:

Agro-based industries and information technology industries

Answer :

Basis	Agro-based industries	Information technology
Base	In the agricultural industry, fertile land is the base for the agro-based industry.	Computers and the internet is the base for the IT industry.
Labor	There is less need for skilled labour for the agricultural industry.	The skilled and specialized technician is the need for the IT industry
Cost	Less need for capital investment. Investment is needed only for fertile land and agricultural equipment.	High capital investment is required for investing in land, computers and other technical equipment.
Employees	Knowledge about the traditional system of agriculture is the pre-requisite for employment.	Excellence in the related technical field is the pre-requisite for selecting the employees.

Activity

Q. 1. Collect information about anyone project undertaken in your village/city under the Corporative Social Responsibility and present it in the class.

Answer : Corporate social responsibility (CSR) is a business model that helps a company to be socially accountable — to itself, its stakeholders, and the public. By involving in corporate social responsibility, companies can be aware of the kind of influence they are having on all sides of the society- economic, social, and environmental.

The Procter & Gamble Company (P&G) is an American multinational consumer goods corporation headquartered in Ohio. It was founded in 1837 by British American William Procter and Irish American James Gamble. It specializes in a wide variety of personal health/consumer health, and personal care and hygiene products.

P&G's leading Corporate Social Responsibility Program Shiksha is themed as Live, Learn and Thrive. Shiksha was launched in 2005 to enable consumers to contribute towards the cause of education of the deprived children. Since its initiation, Shiksha has made a donation of over Rs. 22 crores towards helping children on the path to improved education facilities. Shiksha has till date helped 280,000 neglected children to access their right to education. The program has constructed and reinforced over 140 schools across India, in partnership with NGOs like Round Table India (RTI), Save the Children (STC), Army Wives Welfare Association (AWWA) and Navy Wives Welfare Association (NWWA).

Each of Shiksha's NGO partners focuses on an important approach to education. The NGO Round Table India concentrates on building educational infrastructure and supporting schools across India. Save the Children stresses on the education of the girl child by supporting the government's Kasturba Gandhi BalikaVidhyalays, and the NGOs AWWA and NWWA attends to the educational requirements of the differently-abled children of naval and army officer's families.

Shiksha's involvements extend across health and hygiene facilities at schools such as clean drinking water and separate toilets for boys and girls, advanced educational aids such as libraries and computer centres, as well as basic infrastructure. Shiksha aims to shape the educational future of India brick – by – brick by addressing the need for better educational infrastructure and building the assets of schools.

Intext Questions

Q. 1.

Figure 8.1

In figure 8.1 the sequence of two industrial processes has been given. Arrange the pictures in proper sequence and write the sequential number in the box given below.

• Name the two industries

• Name the raw material and the finished product of both these industries.

• How is the raw material converted into the finished product?

• Why is it necessary to convert the raw material into the finished product?

Answer : • The two industries are cotton industry and sugar industry.

• Cotton industry:

Raw material- cotton balls (i.e. raw cotton)

Final product- spun/ woven cloth.

Sugar industry:

Raw material- sugarcane

Final product- sugar/jaggery

• Cotton industry:

a. Cotton plants are cultivated and are grown in their respective seasons.

b. They are harvested and then sent to the factories in bulk quantities.

c. Here, they are refined and spun into threads, which are then dyed according to colour requirements.

d. Then, these threads are woven to create cloth.

Sugar industry:

a. Sugarcane, which is a year-long crop, is grown and harvested.

b. They are sent to the factories via roadways, i.e. mostly trucks.

c. At the factories, they are cut, juiced and prepared as per requirements.

d. This forms the final product, i.e. sugar.

• a. The conversion of raw materials into final goods is very essential because many of the products cannot be used in their raw state. Other than that, many a times, the value of finished product is much more than the raw material and can be used for earning huge profits. E.g. cotton clothes are more likely to earn profits rather than raw cotton.

Q. 2. Study the factors given below and state which industries could develop in these regions.

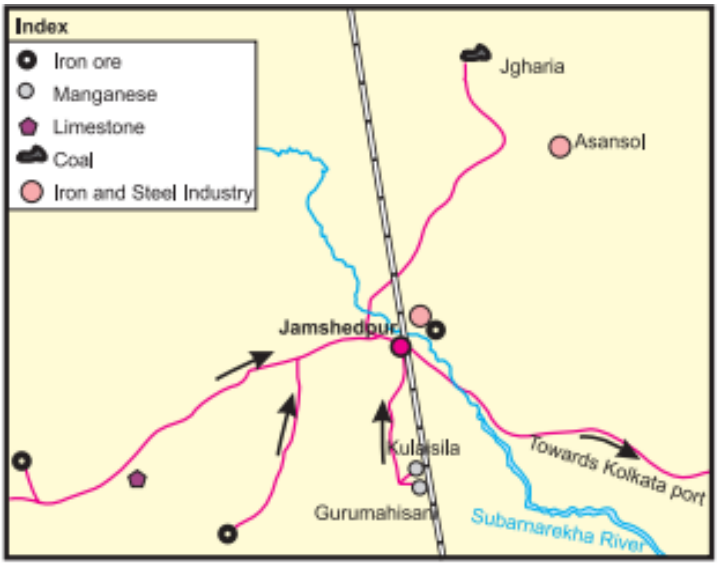
• Excellent transport facilities, skilled labour and uninterrupted supply of electricity.
• Limestone deposits, cheap labour, uninterrupted supply of water and electricity, increasing urbanisation.
• Fruit orchards, labour, excellent transportation facilities, unlimited water supply, uninterrupted electricity and ready market.

Answer : • Textile industry, Chemical industry, Food processing industry.

• Iron and Steel industry, Mining industry.

• Food processing and manufacturing industries like juice and other perishable products which requires ready market.

Q. 3.



Study figure 8.2 and answer the following questions.
• Name the industry at Jamshedpur?
• Which raw material is required for this industry?
• From which areas is this raw material obtained?
• Why is coal used in this industry?
• State with reasons if it would be feasible to set up an iron and steel industry in your district?

Answer : • Jamshedpur houses some of the most important iron and steel industries of India.

• Iron ore (mostly haematite and magnetite) is required for this industry.

• This raw material is obtained from the areas in and around Jamshedpur.

• Coal is used in order to power the thermal power plants, which produce electricity for the process.

• No, it will not be feasible to set up an iron and steel industry in my district.

This is because it lacks the required amount f resources to set up the industry. Hence, even if the industry is set up, it will lead to more losses than profits.

Q. 4. Examine all the three pictures shown below and answers the following questions.

• Name the industry shown in picture A
• What is the difference between the industries shown in pictures A and B?
• What is distinctive about the industry in picture C.
• Identify the industry shown in the picture above.
• Name some more similar industries.

Answer : • The industry shown in picture A is a food industry, which is run by a self-help group.

• The difference between the two pictures is that A is agro-based and B is forest-based.

• The industry shown in picture C is an iron and steel industry, with modernized equipment and technology.

• The industry shown in the picture is an iron and steel industry.

• Some similar industries are the coal and petroleum industries.

Q. 5. Complete the list with reference to industries

Answer :

Industry	Type	Raw Material
Manufacture of iron rods	Mineral-based	Iron ore
Manufacture of candles	Mineral-based	Petroleum
Furniture manufacture	Forest-based	wood
Paper Manufacture	Forest-based	wood
Manufacture of Medicines	Agro-based	Herbal plants
Sugar Manufacture	Agro-based	sugarcane
Jaggery Manufacture	Agro-based	sugarcane
Aagarbatti Manufacture	Agro-based	Flowers, plants
Manufacture of cotton clothes	Agro-based	cotton
Manufacture of Railway Engines	Mineral-based	bauxite
Papad Making	Agro-based	pulses and cereals

Q. 6. Study the factors given in fig 8.7 and classify them as per their advantages and disadvantages in relation to industries.

Answer :

ADVANTAGES	DISADVANTAGES
Employment	Slums
Development of agriculture	Depletion of forest land
Population	Pollution
Stable prices of commodities	More land under irrigation
Skilled manpower	Increasing land prices
Market	Poverty
Development of transport facilities.	Number of migrants
Communication	
Ample water	
Boost to the power supply	
Cultural development	

Q. 7. • What are the different ways of obtaining information?

• Which is the fastest way of obtaining information?
• How do WhatsApp, Facebook, Google maps, etc. work?

Answer : • Newspapers, books, the internet and word of mouth are a few ways to obtain information.

• The internet is the fastest way of obtaining information.

• Whats app works to connect people via messaging, voice calls and video calls.

Facebook connects people through user-friendly interactive features.

Google maps help in navigation, thus connecting people.

Q. 8. Talk about the interrelationship between human resources and industry.

Answer : The interrelationship between Human Resources and industry-

a. Human resources are the foundation stones for industries, as it is not possible to run an industry without efficient HR.

b. Human resource is one of the major contributors to the development of industries.

c. The development of industry is proportional to the quality of human resource. Better the human resources, higher the industrial development.

Hence, an efficient human resource is absolutely essential for industries.

Q. 9. In India, many important public sector undertakings have been established. Their acronyms (abbreviated forms) have been given. Find their long forms and write them down. BHEL, BEL, HAL, ONGC, NTPC, NTC, SAL, GAIL, e.g., BHEL: Bharat Heavy Electricals Limited.

Answer : Following are the full forms of the acronyms-

1. BHEL – Bharat Heavy Electricals Limited

2. BEL – Bharat Electricals Limited

3. HAL – Hindustan Aeronautics Limited

4. ONGC – Oil and Natural Gas Corporation

5. NTPC – National Thermal Power Corporation

6. NTC – National Textile Corporation

7. SAL - Société Anonyme Libanaise

8. GAIL – Gas Authority of India Limited

Q. 10. Important information technology centres are called IT hubs. Find out with the help of the internet in which cities such hubs have developed and mark them on an outline map of India.

Answer :

Q. 11. If you become an industrialist, which of the following would you do?

• Only make profits
• Start a second industry from the earlier one as a supplementary industry.
• Will spend some amount for the society after the deduction of tax.
• Provide help for the creation of new industrialist.

Answer : If I became an industrialist, I would-

a. Start a second industry from the earlier one as a supplementary industry.

b. Spend some amount of money for society after the deduction of tax.

c. Provide help for the creation of a new industrialist.

Q. 12.

• In what context is this logo?
• What will be the benefit of this programme?
• What is the correlation between this programme and employment?
• Which are the Navaratana industries of India?
• Why do you think they have been accorded this status of Navaratna?

Answer : • This is the logo of Make In India.

• This programme was introduced in order to promote the development of indigenous industries.

a. It has helped a number of industries which were in the shadows to rise to prominence.

b. It has boosted the Indian economy.

• This programme has boosted employment in various ways.

This is because with the development of industries, a higher amount of labour is required, generating more employment opportunities.

• The Navaratna industries of India are-

1. Bharat Electronics Limited (BEL)

2. Container Corporation of India Limited

3. Engineers India Limited

4. Hindustan Aeronautics Limited

5. Hindustan Petroleum Corporation Limited

6. Mahanagar Telephone Nigam Limited

7. National Aluminium Company Limited

8. National Buildings Construction Corporation Limited

9. NMDC Limited

10. Neyveli Lignite Corporation Limited

11. Power Finance Corporation Limited

12. Power Grid Corporation of India Limited

13. Rashtriya Ispat Nigam Limited

14. Rural Electrification Corporation Limited

15. Shipping Corporation of India Limited

• Some of the Public Sector Enterprises (PSE) are accorded the status of Navaratna as these industries are vested with autonomous powers in order to make them stand tall in the global environment. These industries can invest upto Rupees one thousand crores without the explicit approval of the government.

Map Scale

Intext Questions

Q. 1.After studying the picture have a discussion in the class and answer the following questions.

• Why is the painter holding the pencil in his hand in a particular way?
• How can the scene of this large landscape be depicted on paper?
• How is it possible to view all the countries of the world on one map?
• What is common to both these pictures?

Answer : • The painter is holding the pencil in such a way so that he can take an appropriate measurement of the objects in the painting.

• This scene can be depicted on paper by reducing the proportions of the elements of the scene on a fixed scale.

a. In the preparation of maps, the picture is first surveyed**.**

b. At that time, after special observation, a scale is fixed.

c. Using this scale, an outline map of the earth is prepared.

Hence, we can view all the countries of the world on one map.

A fixed scale or measurement is common in both the pictures.

Q. 2. What is the need to use map scale? Think about it and write a paragraph.

Answer : Maps are used to show any part or the whole of earth or any other celestial body. Map scale helps to reduce the proportions of these regions in scale length, hence providing an accurate image.