GEOGRAPHY

Q. Examine the feasibility and challenges of having two time zones in India.

Approach:

Write briefly about the existing standard time zone and the problems associated with it in North eastern region.

Write the benefits of two time zones.

Write the problems associated with two time zones.

Suggest a way forward to resolve the issue of two zones.

Answer:

Introduction

India stretches nearly 3000 km from the east to the west. There are about 28 degrees of longitude between the country's eastern and western extremities which results into approximately two hours time difference between the westernmost and the easternmost point. Indian Standard Time (calculated on the basis of 82.5' E longitude, in Mirzapur, Uttar Pradesh), does not affect most of the Indians, except those who live in the Northeast region where the sun rises around 4 a.m. in summer, and gets dark well before 4 p.m. in winter. So the Northeast region has long complained about the effect of a single time zone on their lives and their economies.

Recently Council of Scientific & Industrial Research's National Physical Laboratory (CSIR-NPL), which maintains Indian Standard Time (IST), published a research suggesting two time zones and two ISTs in India: IST-I for most of India and IST- II for the North-eastern region – separated by difference of one hour.

Body:

Benefits of two Time Zones

It will lead to greater efficiencies among the workforce and on energy consumption. Reduction in energy consumption will significantly cut down India's carbon footprint boosting India's resolve to fight climate change.

There are economic benefits in having two different time zones as people will be able to work better and plan better, according to natural cycles.

Many social policy objectives can be achieved such as reducing road accidents and improving women's safety.

Two time zones will allow aligning standard time with daylight time.

Problems with two time Zones

There will be mismatch in office timings and different working hours for banks.

Implementing two time zones will require synchronizing railway traffic which otherwise will create utter confusion and there's a chance that railway accidents might become more frequent.

With significant illiteracy levels, if the country were divided into two time zones, there would be chaos at the border between the two zones. It would mean resetting clocks with each crossing of the time zone.

Marking of the dividing line of the two zones would be a problem.

Two time zones can have adverse political consequences as India apart from getting divided on the lines of religion, caste, race, language, etc, now will get divided on the lines of Time Zones.

The need of the hour is to initiate a process of consultation to consider all aspects regarding the Indian time zone afresh. Proposal of some researchers to set the IST forward by half an hour so that it is six hours ahead of Universal Coordinated Time can be examined and debated. This will mean advancing the IST from 82.5 degree East to 90 degree East, which will fall at a longitude along the West Bengal-Assam border would go some way in meeting Assam's demand, and help avoid potential grievances from northwestern India about corresponding inconveniences caused by advancing by one full hour.

Q. Examine the concept of Daylight Saving Time along with its relevance, advantages and issues related to it.

Approach

Describe Daylight Saving Time.

Give advantages and the relevance in present time of DST.

Bring out the issues involved in DST

Answer

Introduction:

Daylight Saving Time (DST) is the practice of setting the clocks forward one hour from standard time during the summer months, and back again in the winter, in order to make better use of natural daylight.

In the Northern Hemisphere Daylight Saving Time usually starts in March-April and ends in September-November when the countries return to standard time.

Body

Advantage of DST

The key argument for DST is to save energy. Individuals will complete their daily work routines an hour earlier, and that extra hour of daylight means lower consumption of energy.

Relevance

In context of increasing focus on energy efficiency due to climate change because of over consumption of energy DST remains relevant. DST is thus environmentally sustainable concept.

DST is also relevant for developing countries to reduce energy cost on lightening. For developed countries, DST can help in reducing their energy intensity.

In Indian context debate is going on using more than one time zone to ensure eastern states can take advantage of early sunrise and natural sunlight. This argument is similar to DST in Europe and USA.

Issues

Critics of DST argue lights have become increasingly efficient, so lighting is responsible for a smaller chunk of total energy consumption than it was a few decades ago. Heating and cooling probably matter more, and some places may need air-conditioning for the longer, hotter evenings of summer daylight saving time.

Studies in USA suggest one hour of lost sleep due to DST increases the fatal crash rate by 5.4% to 7.6% for six days following the transition.DST disrupts natural circadian rhythm which regulates many biological processes like hormone productions and sleep patterns.

Conclusion:

Recently,European Union Parliament voted to scrap the use of DST, followed twice a year by some 70 countries, including those in the European Union.

The argument of DST needs to be studied scientifically as DST involves number of issues and widely impacts the human life.

Q. Despite being mineral-rich regions, the Eastern states of India have failed to register expected growth and social indices. Examine the reasons for this failure along with suitable remedial measures.

Approach:

Introduce by mentioning about the mineral wealth of Eastern India.

Mention the reasons for poor socio-economic growth of the region.

Suggest measures to improve the condition.

Introduction:

As per the ministry of Mines data, the eastern states of India - Jharkhand (7.72%), Chhattisgarh (6.65%) and Odisha (10.62%) account for more than 24.9% of the value of mineral production in the country. Despite being mineral rich region, it remains to be one of the most underdeveloped regions of the country. They continue to fare badly in indicators like health, education, employment and social inclusion.

Body:

Reasons for poor growth and social indices:

Neglect in policy making: The region has a history of exploitation of its mineral wealth without giving due regard to harmful impacts on the environment and local people. The locals being poor and vulnerable have no say in high level decision making. Even Gram Sabhas do not work as per their mandate.

Opposition from local people: Rapid growth and industrialization is resisted by local people due to mistrust on governance policies which resulted into growth of Naxalism.

Difficult terrain and low outreach: A number of villages are remotely located which creates hindrances in implementation of government programmes like immunization, literacy promotion, etc.

Negative impacts of mining: Mining has direct impacts on health and well being of locals. Cancer cases in the nearby villages of Jaduguda mines of Jharkhand due to radioactive waste generated from uranium mining are widely documented.

Remedial measures to improve the situation:

Utilizing District Mineral Foundation funds: MMDRA Act 2015 mandates that 60% of the DMF funds must be utilized for high priority areas such as drinking water supply, health care, sanitation, education, skill development, women and child care, welfare of aged and disabled people and environment conservation.

There is need to expedite work of Pradhan Mantri Khanij Kshetra Kalyan Yojana (PMKKKY) to ensure sustainable livelihood for the affected people.

Institutional approaches: National Mineral Policy 2019 suggests establishing an inter-ministerial body to create a mechanism for ensuring sustainable mining with adequate concerns for the environment and socio-economic issues in the mining areas, and to advise the Government on rates of royalty, dead rent etc.

Investing in infrastructure: Improving connectivity, increasing irrigated area which is currently only 16.6% in Chhattisgarh and 7% in Jharkhand is the need of the hour.

Promoting local specialization and resources: Providing GI tags to local producers which help in export earning, promotion of tourism, cultural heritage and regional identity, simultaneously preserving traditional skills.For ex: Odisha's Kotpad Handloom fabric, Bastar Iron Craft of Chhattisgarh, etc.

Similarly, with India going plastic free, utilizing the minor forest produce like Tendu leaves, jute and handloom products has immense potential to boost the local economy.

Boosting tourism potential: The Tribal Circuit of Swadesh Darshan Scheme aims to develop and promote tribal rituals, festivals, customs and culture. This is also necessary to promote national integration by developing a sense of respect for the tribal way of life.

Conclusion:

Development of the Eastern States is critical for achieving Sustainable Development Goals 1(No poverty), 2(Zero Hunger), 3(Good Health and Well Being), 4(Quality education) and 10(Reduced Inequalities).

All developmental policies for the socio-economic growth of the region should adhere to the motto of 'Sabka Sath Sabka Vikas'. Inclusive and sustainable growth is the way forward.

Q. Monsoon has wide ranging impacts on Socio-Economic Life in India. Substantiate.

Approach:

Elaborate the meaning of monsoon climate in brief.

Discuss the positive and negative impacts of monsoon on Socio-economic life in India.

Enumerate the imminent challenges to the pattern of monsoon climate.

Conclude by giving solutions to achieve reliability and sustainability in life.

Introduction

Monsoon connotes the climate associated with seasonal reversal in the direction of winds. The reversal of wind occurs due to the pressure difference caused by differential heating and cooling of landmass and water bodies.

India receives south-west monsoon winds in summer and north-east monsoon winds in winter. South-west monsoons bring intense rainfall to most of the regions in India and north-east monsoons bring rainfall to mainly south-eastern coast of India.

Body

Impacts of monsoon on life in India

Positive Impacts

Unity due to monsoon climate: The monsoon regime emphasises the unity of the vast stretches across India. For example, the climate of Kerala and Tamil Nadu in the south are so different from that of Uttar Pradesh and Bihar in the north, and yet all of these have a monsoon type of climate which encourages more or less the common ways of living.

Economic life: Monsoon is that axis around which the entire agricultural cycle of India revolves. About 64 percent of the people of India are directly dependent on agriculture for their livelihood.

Recharges dams and aquifers: Monsoon rain helps recharge of rivers, dams and reservoirs, which is further used for the generation of hydro-electric power.

Diversification of crops: Regional variations in monsoon climate help in growing various types of crops. Due to this a large variety of crops are available in India which are exported to different parts of the world.

Cultural diversity: Regional monsoon variation in India is reflected in the vast variety of cuisine, attire and housing pattern. This makes India a highly culturally diverse country.

Ecological diversity: Also, great ecological diversity has flourished mainly due to monsoon type of climate.

Negative impacts

High dependence on erratic monsoon: Agricultural prosperity of India depends very much on timely and adequately distributed rainfall. If it fails, agriculture is adversely affected particularly in those regions where means of irrigation are not developed.

Soil erosion and degradation: The summer rainfall due to south west monsoon comes in a heavy downpour leading to considerable run off and soil erosion. Also, Sudden monsoon burst creates problem of soil erosion over large areas in India.

Highly concentrated rainfall: The average annual rainfall in India is about 125 cm, but it has great spatial variations. Around three fourths of the total annual rainfall is received during four months June to September and other months mostly remain dry. This variability of rainfall simultaneously brings droughts and floods every year in some parts of the country affecting the large scale social and economic life of the country.

In hilly areas sudden rainfall brings landslides which damages natural and physical infrastructure subsequently disrupting human life economically as well as socially.

Imminent Challenges

Monsoon climate is woven into the fabric of Indian social, economic, and political thought in a way that it is not elsewhere. But recently issues of climate change, global warming and increasing pollution have become critical to such a climate and threatens our sustainability.

Conclusion

The population in India is continuously increasing and to ensure food (including water) security to the population, a large part of the monsoon water which is currently unutilized should be held at suitable locations for irrigation and power generation purposes.

We need to invest more resources in better prediction of Monsoon forecast in order to achieve reliability and sustainability.

Thus, the need is to take collective steps to mitigate the risks of climate change, global warming and increasing pollution as we live in a shared world with a shared future.

Q. What do you understand by seismic noise? Discuss its impact on measuring the earth's seismic activities.

Approach

Discuss the context of the topic in brief.

Discuss seismic noise and its source.

Discuss the impact of seismic noise on measuring seismic activities.

Conclude with its significance.

Introduction

The scientist at British Geological Survey (BGS) recently reported a change in the Earth's seismic noise and vibrations amid the coronavirus lockdown. It is observed that there is 30-50 per cent fall in levels of ambient seismic noise.

Body

Seismic Noise and its Source

Seismic noise: It refers to the relatively persistent vibration of the ground. It is the unwanted component of signals recorded by a seismometer which makes it difficult for scientists to study seismic data that is more valuable.

This noise includes vibrations caused due to human activity, such as transport and manufacturing.

The seismic noise vibrations caused by human activity are of high frequency (between 1-100 Hz), and travel through the Earth's surface layers.

Seismic noise is also termed as ambient vibrations in other fields of studies such as oil exploration, hydrology, and earthquake engineering.

Benefits of reduction in seismic noise:

Usually, to measure seismic activity accurately and reduce the effect of seismic noise, geologists place their detectors 100 metres below the Earth's surface.

However, since the lockdown, researchers have said that they were able to study natural vibrations even from surface readings, owing to lesser seismic noise.

Conclusion

Seismologists around the world are making an collaborative effort to study the fall in seismic noise levels. Due to lower noise levels, scientists are now hoping that they would be able to detect smaller earthquakes and tremors that had slipped past their instruments so far.

Q. What do you understand by Western Disturbances? Discuss its impact on Indian weather systems.

Approach

In general explain the western disturbances as a geographical phenomena and its main effect on Indian weather systems.

Mention the areas of its origin and influence and briefly explain its mechanism, it can also be illustrated in a suitable diagram.

Explain the impact of western disturbances on India in various dimensions like climate, agriculture and disasters associated with it.

Summarise the answer and mention some of the measures to augment the preparedness to deal with the western disturbances

Introduction

The western cyclonic disturbances are weather phenomena of the winter months brought in by the westerly flow from the Mediterranean region.

The word 'Western' refers to the direction from which they originate with regard to India.

The word 'disturbance' is used because the air within the low pressure systems tends to be unstable or disturbed.

They are extratropical storms that bring winter rain to the northwestern parts of the Indian subcontinent.

Body

Areas of Influence of western Cyclonic Disturbances

The western cyclonic disturbances originate in the Mid- latitude region near the Atlantic ocean and Europe.

The low pressure typically forms over the Mediterranean Sea and travels over Iran, Iraq, Afghanistan and Pakistan before entering India loaded with moisture.

In India they usually influence the weather of the north and north-western regions.

Mechanism

Origin: During winters, a high-pressure system develops in the regions around Ukraine which causes the cold air from polar regions to collide with the relatively warm and moist air at lower/temperate latitudes.

The warm air mass is usually a part of the westerlies and carries a lot of moisture. When the two air masses at different temperatures meet, a front is formed.

Eastward movement towards India: The formation of a front leads to cloud formation and heavy rainfall in areas coming under the influence of the frontal activity. This leads to formation of temperate cyclones in the upper atmosphere.

At such heights, these cyclones come into contact with the subtropical westerly jet stream which carries them eastwards.

In the course of its travel, the cyclone gathers moisture from the Caspian Sea and the Persian Gulf. It enters India mainly through the states of Punjab, Haryana, and Rajasthan.

Impact

Climate: Western Disturbances are the cause of the most winter and pre-monsoon season rainfall across North-West India.

This phenomenon is usually associated with cloudy sky, higher night temperatures and unusual rain. It is estimated that India gets close to 5-10% of its total annual rainfall from western disturbances.

In winter, western winds bring moderate to heavy rain in low lying areas and heavy snow to mountainous areas of the Indian subcontinent.

South west monsoon covers most of India but parts of North India don't get much rain from it. These regions depend upon rain from western disturbance during the winter season from November to March.

The snow from the western disturbances also feed the glaciers which are the source of most of the rivers in Northern India.

After winter the western disturbances help in the activation of monsoon in certain parts of northwest India.

The interaction of the monsoon trough with western disturbances may occasionally cause dense clouding and heavy precipitation.

Winter rainfall and agriculture: An average of 4-5 western disturbances form during the winter season and the rainfall distribution varies in every western disturbance.

Precipitation during the winter season has great importance in agriculture particularly for rabi crops including wheat, which is one of the most important Indian crops.

The rainfall brought about by western disturbances have a direct impact on economies of wheat producing states like Haryana and Punjab.

Weak western disturbances are even associated with crop failure and water problems across north India.

Strong western disturbances can help residents, farmers and governments avoid many of the problems associated with water scarcity.

Disaster: Unseasonable rainfall and hail brought about by western disturbances damages the crops in the North Indian states like Haryana, Punjab, Madhya Pradesh and Rajasthan.

These storms also bring about lightning in areas affected by it. Recently, in Rajasthan, a number of casualties have been caused by lightning brought about by western disturbances.

Natural disasters like cloudburst in Leh (2010), the Kashmir floods in 2014 and even 2013 floods in Uttarakhand were caused by the Western Disturbances.

These calamities killed thousands of people and caused a lot of destruction in towns and cities situated on the bank of flooded rivers.

Conclusion

Western Disturbances is a complex weather phenomena and has profound impact on climate and agriculture of India. It is also a source of a number of natural disasters that occur every year in India causing huge loss of lives and property.

Thus, western disturbances need to be studied in much more detail. Like tropical cyclones or monsoon, there needs to be an end to end tracking of western disturbances to make it less hazardous.

Q. Traditional knowledge of water conservation is the only sustainable way to counter the dangers of national water emergencies. Discuss.

Approach

Introduce by stressing on the need for water conservation in the age of urbanisation.

Discuss various traditional water conservation techniques across the country.

List out various pros and cons of traditional water conservation techniques.

Conclude by giving out a balanced opinion on the usage of traditional methods along with modern techniques.

Introduction

Water resources of a country constitute one of its vital assets, but its availability is changing fast both in terms of quantity as well as quality.

The situation is further aggravated by the looming climate change which is going to alter the paradigm of management of water resources. Hence there is a need for conservation of water in this age of rapid urbanisation

India with its rich culture and heritage in terms of images, rituals, traditional knowledge to conserve water, cultural practices and metaphors on water wisdom can suffice the efforts of water conservation in a traditional way by using cultural images on water, ancient practices and work by water warriors to affirm the value of traditional heritage on water wisdom.

Body

India has wide temporal and spatial variation in the rainfall with some season/ areas having high rainfall while others remaining dry. Because of these variations, different parts of the country have developed different traditional methods from ancient times to conserve and store water. Some of these includes:

Tanks in Karnataka: these are artificial reservoirs to store water taking advantage of depression.

Stepwell: these are found in Rajasthan and Gujarat. It incorporated a cylinder well that extended down to the water table—provided water for drinking, washing, bathing, and the irrigation of crops.

Pyne-ahar: system of south Bihar on which the cultivation of paddy depends.

Kuls: these are diversion channels that carry water from a glacier to village. Often spanning long distances, with some over 10 km long, kuls have been around for centuries. They are the lifeline of people of Spiti valley of Himachal Pradesh and in Jammu too.

Tanka system: it is used in Rajasthan, which is a cylindrical ground pit which receives rainwater from the nearby catchment area.

Bamboo drip irrigation: used in the northeast, suitable for irrigation in hilly terrains.

Advantages of traditional water conservation methods:

Sustainable and cost-effective: Traditional methods of water conservation are small scale projects that are sustainable and cost-effective

Protects the environment: Along with water conservation, traditional methods serve other purposes as well. One of them is environmental protection, unlike modern methods like dams which do more harm than help, traditional methods do not disturb the environment.

Community participation: In order to make traditional methods work, the whole of the community needs to work. For example, for rainwater harvesting, every house needs to have a system installed. Community participation gives people a sense of belonging and hence, work more efficiently.

Suitable to local mass: the local people are familiar with the traditional methods of water conservation and hence it becomes easier for them to adapt to these methods.

Disadvantages of traditional water conservation techniques:

Low efficiency: the efficiency rate of traditional techniques is low. Therefore, they are not suitable for a large urban population.

Not suitable for urban masses: there is very less vacant land available in urban areas for traditional infrastructures. Also, urban masses are not familiar with these ideas.

Lack of leadership: to make traditional methods successful, the whole community needs to give their contribution. In the absence of a strong leadership, these techniques may turn into failures.

Conclusion

These traditional systems are ecologically safe, viable and cost-effective alternatives to rejuvenate India's depleted water resources. But using only traditional methods is not enough. Productively combining these structures with modern rainwater saving techniques, such as percolation tanks, injection wells and subsurface barriers, could be the answer to India's perennial water woes.

Q. Landslides are more than just a natural phenomena. Discuss the statement and suggest the ways to mitigate the disaster.

Approach

Introduce by defining landslides.

Write the natural causes of landslides.

Also, mention the man made factors responsible for landslides.

Suggest ways to mitigate the disaster.

Conclude on a positive note.

Introduction

The term 'landslide' includes all varieties of mass movements of hill slopes and can be defined as the downward and outward movement of slope forming materials composed of rocks, soils, artificial fills or combination of all these materials along surfaces of separation by falling, sliding and flowing, either slowly or quickly from one place to another.

Although the landslides are primarily associated with mountainous terrains, these can also occur in areas where an activity such as surface excavations for highways, buildings and open-pit mines takes place.

Body

Natural Causes of Landslide: There are several natural causes of landslides. Some of the major causes are as follows:

Geological Weak material: Weakness in the composition and structure of rock or soil may also cause landslides.

Intense rainfall: Storms that produce intense rainfall for periods as short as several hours or have a more moderate intensity lasting several days causes erosion of the slopes that triggers abundant landslides.

Heavy melting of snow in the hilly terrains also results in landslides.

Earthquake shaking has triggered landslides in many different topographic and geologic settings. Rock falls, soil slides and rockslides from steep slopes involving relatively thin or shallow dis-aggregated soils or rock, or both have been the most abundant types of landslides triggered by historical earthquakes.

Volcanic eruption: Deposition of loose volcanic ash on hillsides commonly is followed by accelerated erosion and frequent mud or debris flows triggered by intense rainfall.

Man-made Factors responsible for Landslides:

Human Excavation of slope and its toe, loading of slope/toe, a drawdown in reservoir, mining, irrigation, vibration/blast, Water leakage from services.

Erosion of slopes due to human interference increases the vulnerability of the terrain to slide down.

Other factors:

Intense deforestation, soil erosion;

Construction of human settlement in landslide prone areas;

Roads or communication lines in mountain areas;

Building with weak foundations;

Buried pipelines;

Lack of understanding of landslide hazards, lack of warning system.

Possible Risk Reduction Measures

Hazard mapping locates areas prone to slope failures. This will help to avoid building settlements in such areas. These maps will also serve as a tool for mitigation planning.

Land use practices such as:

Areas covered by degraded natural vegetation in upper slopes are to be afforested with suitable species. Existing patches of natural vegetation (forest and natural grassland) in good condition, should be preserved.

Any developmental activity initiated in the area should be taken up only after a detailed study of the region has been carried out.

In the construction of roads, irrigation canals etc. proper care is to be taken to avoid blockage of natural drainage

Total avoidance of settlement in the risk zone should be made mandatory.

Relocate settlements and infrastructure that fall in the possible path of the landslide.

No construction of buildings in areas beyond a certain degree of slope.

Retaining Walls can be built to stop land from slipping (these walls are commonly seen along roads in hill stations). These are constructed to prevent smaller sized and secondary landslides that often occur along the toe portion of the larger landslides.

Surface Drainage Control Works: The surface drainage control works are implemented to control the movement of landslides accompanied by infiltration of rainwater and spring flows.

Increasing vegetation cover: it is the cheapest and most effective way of arresting landslides. This helps to bind the top layer of the soil with layers below while preventing excessive run-off and soil erosion.

Insurance will assist individuals whose homes are likely to be damaged by landslides or by any other natural hazards.

Conclusion

Increasing human interference with nature has led to rise in the number of natural disasters.

However, the National Disaster Response Force under The Disaster Management Act, 2005 have conducted several successful rescue operations by providing aid and assistance to the affected state, including deploying, at the State's request, of Armed Forces, Central Paramilitary Forces, and such communication, air and other assets. They have also worked to increase the awareness among people to reduce the effect of such natural calamities by organising preparedness campaigns.

Q. What do you understand by the phenomenon of the inversion of temperature? Examine how does it impact the atmosphere and the weather.

Approach

In the introduction, define the term temperature inversion.

Explain the favourable conditions that lead to temperature inversion.

Discuss the impact of temperature inversion on the atmosphere and the weather.

Conclude by summarising your answer.

Introduction

Temperature inversion is a reversal of the normal behavior of temperature in the troposphere. Under this meteorological phenomenon a layer of warm air lies over the cold air layer.

It is caused in stac atmospheric conditions while some times, it occurs due to horizontal or vertical movement of air.

Temperature inversion is usually of short duration but quite common nonetheless

Body

Favourable conditions for temperature inversion

Long winter nights: Loss of heat by terrestrial radiation from the ground surface during night may exceed the amount of incoming solar radiation.

Cloudless and clear sky: Loss of heat through terrestrial radiation proceeds more rapidly without any obstruction.

Dry air near the ground surface: It limits the absorption of the radiated heat from the Earth's surface.

Slow movement of air: It results in no transfer or mixing of heat in the lower layers of the atmosphere.

Snow covered ground surface: It results in maximum loss of heat through reflection of incoming solar radiation.

Effects on atmosphere and weather

Temperature inversion determines the precipitation, forms of clouds, and also causes frost due to condensation of warm air due to its cooling.

Dust particles hanging in the air: Due to inversion of temperature, air pollutants such as dust particles and smoke do not disperse on the surface.

Stops the movement of air: It causes the stability of the atmosphere that stops the downward and upward movement of air.

Less rainfall: Convection clouds can not move high upwards so there is less rainfall and no showers. So, it causes a problem for agricultural productivity.

Lower visibility: Fog is formed due to the situation of warm air above and cold air below, and hence visibility is reduced which causes disturbance in transportation.

Thunderstorms and tornadoes: Intense thunderstorms and tornadoes are also associated with inversion of temperature because of the intense energy that is released after an inversion blocks an area's normal convention patterns.

Diurnal variations in temperature tend to be very small.

Conclusion

To conclude, temperature inversion might be a desirable phenomena when it comes to cooler air temperatures, and comfort after an extremely hot and oppressive day, the after-effects on air quality are certainly not desirable.

Q. What do you understand by continental drift theory? Discuss along with the evidences that support the theory.

Approach:

Explain the continental drift theory.

List the evidence in support of the theory.

Introduction

Continental drift theory deals with the distribution of the oceans and the continents. It was first suggested by a German meteorologist, Alfred Wegener in 1912.

Body

According to the theory, all the continents formed a single continental mass- Pangea and mega ocean- Panthalassa surrounded it.

Around 200 million years ago Pangaea started splitting and broke down into two large continental masses as Laurasia and Gondwanaland forming the northern and southern components respectively.

Subsequently, Laurasia and Gondwanaland continued to break into various smaller continents that exist today.

Evidence that supports the theory

The Matching of Continents (Jig-Saw-Fit): The shorelines of Africa and South America facing each other match remarkably.

Rocks of Same Age Across the Oceans: radiometric dating methods have correlated the rock formation in different continents.

Tillite: The glacial tillite found in Gondwana system of sediments has its resemblance to six different landmasses of the Southern Hemisphere. Counterparts of this succession are found in Africa, Falkland Island, Madagascar, Antarctica and Australia besides India.

Placer Deposits: The placer deposits of gold in the Ghana coast do not have source rock in the region. The gold deposits of Ghana have been derived from the Brazil plateau when the two continents lay side by side

Distribution of Fossils: identical species of plants and animals adapted to living on land or in freshwater are found on either side of the marine barriers. For example remains of Mesosaurus, a freshwater crocodile-like reptile that lived during the early Permian (between 286 and 258 million years ago), are found solely in Southern Africa and Eastern South America.