


**(WORLD GEOGRAPHY, INDIAN GEOGRAPHY AND GEOGRAPHY OF
TELANGANA STATE AND ENVIRONMENT ISSUES : DISASTER
MANAGEMENT PREVENTION AND MITIGATION STRATEGIES)**

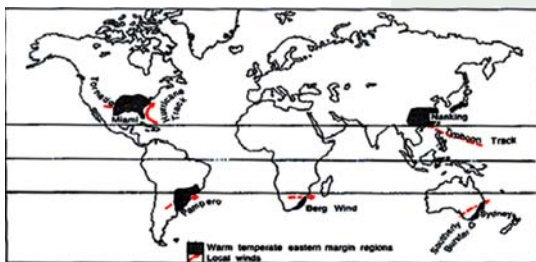
Key with Explanation

<p>1.</p>	<p>C</p> <p>Warm Temperate Western Margin Climate (Mediterranean) is found in relatively few areas in the world. They are entirely confined to the western portion of continental masses, between 30 degrees and 45 degrees north and south of the equator. The basic cause of this type of climate is the shifting of the wind belts. Though the area around the Mediterranean Sea has the greatest extent of this type of 'winter rain climate' and gives rise to the more popular name Mediterranean Climate, the best developed form of this peculiar climatic type is, in fact, found in central Chile. Other Mediterranean regions include California (around San Francisco), the south-western tip of Africa (around Cape Town), southern Australia (in southern Victoria and around Adelaide, bordering the St. Vincent and Spencer Gulfs), and south-west Australia (Swanland).</p> 	<p>Onam in Kerala, Podu in AP. The same is known as Bewar in Madhya Pradesh.</p> <p>Over a large part of Northeast India, chief characteristics of shifting cultivation, while having different local names are found to be the same. These are:</p> <ol style="list-style-type: none"> 1. Rotation of fields 2. Use of fire for clearing the land 3. Keeping the land fallow for regeneration for a number of years 4. Use of human labour as main input 5. Non-use of the plough, but instead very crude and simple implements such as dibble sticks and scrapers, are used, and 6. All the crops being grown are mixed together. <p>Shifting Cultivation is known as Ladang in Indonesia, Caingin in Philippines, Milpa in central America & Mexico, Ray in Vietnam, Taungya in Myanmar, Tamrai in Thailand, Chena in Sri Lanka, Conuco in Venezuela, Roca in Brazil, Masole in central Africa.</p> <p>3. B</p> <p>In the Tropical Savanna region, days are hot, and during the hot season, noon temperatures of over 100 degrees F are quite frequent. When night falls the clear sky which promotes intense heating during the day also causes radiation in the night. Temperatures drop to well below 50°F and night frosts are not uncommon at this time of the year. This extreme diurnal range of temperature is a characteristic feature the Sudan (Savanna) type of climate.</p> <p>The prevailing winds of the region are the Trade Winds which bring rain to the coastal districts. They are strongest in the summer but are relatively dry by the time they reach</p>
<p>2.</p>	<p>B</p> <p>Under shifting cultivation, a piece of land is used for quite some years until the fertility is dropped. After that the farmers move to the new plots. It is practiced by tribal and also known as Burn and Slash cultivation. It is known as Jhoom in Assam,</p>	

the continental interiors or the western coasts of the continents, so that grass and scattered short trees predominate. In West Africa, the North-East Trades, in fact, blow off-shore from the Sahara Desert and reach the Guinea coast as a dry, dust-laden wind, called locally the Harmattan, meaning 'the doctor'. It is so dry that its relative humidity seldom exceeds 30%. 'The doctor' provides a welcome relief from the damp air of the Guinea lands by increasing the rate of evaporation with resultant cooling effects but it is such a dry dusty wind that, besides ruining the crops, it also stirs up a thick dusty haze and impedes inland river navigation.

4. **D**

World map showing areas under the warm temperate eastern margin climate is shown below. Namibia which lies on the South-West coast of Africa is not under the influence of warm temperate eastern margin type of climate.



5. **A**

The natural vegetation of the Cool Temperate Western Margin (British type) climatic type is deciduous forest. The trees shed their leaves in the cold season. This is an adaptation for protecting themselves against the winter snow and frost. Shedding begins in autumn, the 'fall' season, during which the leaves fall and are scattered by the winds.

Some of the more common species include oak, elm, ash, birch, beech, poplar, and hornbeam. In the wetter areas grow willows, alder and aspen. Elsewhere are found other species, e.g. chestnut, sycamore, maple, and lime.

Unlike the equatorial forests, the deciduous trees occur in pure stands and have greater lumbering value from the commercial point of view. The open nature of the forests with sparse undergrowth is useful in logging operations.

Easy penetration means much cost can be saved in the movement of the logs. The deciduous hardwoods are excellent for both fuel and industrial purposes. In Tasmania, the temperate eucalypts are also extensively felled for lumbering industry.

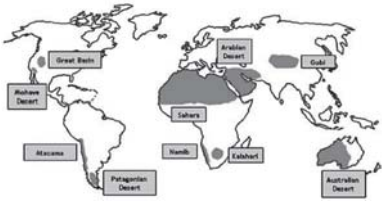
Higher up the mountains in the Scandinavian highlands, the Rockies, southern Andes and the Southern Alps of New Zealand, the deciduous trees are generally replaced by the conifers which can survive a higher altitude, a lower temperature and poorer soils.

6. **A**

Taiga, generally referred to in North America as a boreal or snow forest, is a biome characterized by coniferous forests comprising mostly pines, spruces, and larches.

The taiga or boreal forest has been called the world's largest land biome. In North America, it covers most of inland Canada, Alaska, and parts of the northern contiguous United States. In Eurasia, it covers most of Sweden, Finland, much of Russia from Karelia in the west to the Pacific Ocean (including much of Siberia), much of Norway and Estonia, some of the Scottish Highlands, some lowland/coastal areas of Iceland, and areas of northern Kazakhstan, northern Mongolia, and northern Japan (on the island of Hokkaido).



<p>7.</p>	<p>A</p> <p>Despite its inhospitality, the desert has always been inhabited by different groups of people. They struggle against an environment deficient in water, food and other means of livelihood. Some, like the Egyptians have attained a high level of civilization, others like the Bedouin Arabs have fared quite well with their flocks of sheep, goats, camels and horses. Bedouin are nomadic herdsman of Arabian deserts.</p> <p>The Bushmen of the Kalahari and the Bindibu of Australia remain so primitive in their mode of living that they barely survive. They are, in fact, a relic of the Old Stone Age in the modern world. Of the primitive tribes, the Bushmen and the Bindibu are the best known. Both the tribes are nomadic hunters and food gatherers, growing no crops and domesticating no animals. The Bushmen roam the Kalahari Desert with their bows and poisoned arrows, spears, traps and snares. They are not only skilful and strong but have great endurance. In order to capture their prey, they have to be very patient and if necessary, run many miles to track down the wounded animals. In this way, they hunt antelope, and other smaller animals. The women and children collect insects, rodents and lizards, and gather honey, roots, grass and grubs. Great skill is required in obtaining water in the desert. The Bindibu of Australia live in very much the same way as the Bushmen.</p>	<p>9.</p> <p>B</p> <p>The warm temperate western margin climate or the Mediterranean climate is found between 30 degrees and 45 degrees North and South of the Equator. This climate is witnessed in relatively fewer parts of the world and is almost entirely confined to the western margins of the continental landmasses. The basic cause of this climate is the seasonal shift of the wind belts.</p> <p>The Mediterranean climatic region in Europe experiences many local winds due to the topography of the region with the Alps in the North, the Sahara Desert in the South, the continental interiors in the East, and the open Atlantic in the west. These create great differences in temperature, pressure, and precipitation. Bora is cold north-easterly wind along the Adriatic coast. Tramontana and Gregale are cold winds of the Mediterranean Sea.</p> <p>10. C</p> <p>Despite their inhospitable conditions, different types of human settlements have come up in the tropical deserts. Primitive hunters and gatherers, Nomadic herdsmen, Settled cultivators and Mining settlers. Prominent among these include the gold mines in Australia, Diamond mines in Kalahari, Copper mines in Chile, Silver mines in Mexico, Oil in the Persian Gulf countries.</p> <p>In early 1980s, a diamond deposit was discovered in the Central Kalahari Game Reserve within the Bushman community of Gope. Since the discovery of diamonds, many Bushmen have been evicted from the Kalahari.</p> <p>11. C</p> <p>Tropical Monsoon Climate is found in the region bounded by the Tropic of Cancer and the Tropic of Capricorn. The region is also known as Tropical Deciduous Forest</p>
<p>8.</p>	<p>B</p> <p>Among the options, only the deserts of Mohave and Australia are on the western margins of the continents. Location of world deserts is as per below world map:</p> 	

Region. This region includes eastern margins of the continents between 10°N to 30°N and 10°S to 30°S. Rainfall is moderate except in coastal regions and mountainous tracts. The summers are hot and rainy while winters are warm and dry.

The region is influenced by the movement of the inter-tropical convergence zone (ITCZ) and is hot and humid all around the year because the sun remains overhead. Monsoons are seasonal winds, blowing over the landmasses from the seas and vice-versa. They are characterized by a seasonal reversal in the wind direction, leading to variations in temperature and precipitation. Summer, winter, and rainy seasons are the three prominent and distinct seasons of this climatic region.

This climate is confined within 10 - 30 degrees latitudes on either side of the equator - Indian subcontinent, Indo-China (Laos, Vietnam, Cambodia), Thailand, southern China and northern Australia. In contrast, Indonesia lies along the equator.

12. B

The thick forests have an impact over the type of houses that can be built and the type of settlement that is possible in the equatorial regions. The people of the equatorial region are mostly nomadic and move from place to place. However, in some regions, special type of houses are found. In the Amazon, people live in special type of house called Maloca. These houses have steep, slant roofs and apartment like in shape. People also reside in houses with thatched roofs over them. In Malaysia, the villages are called 'kampongs'. The houses in Malaysia are mainly raised on timber stilts. The stilts enable the building to be better suited for the natural terrain. The materials used for constructing the houses comprise of the easily available materials from the forests which comprise of the timber, bamboo and leaves. Moreover, the wood and bamboo that are used also have insulating properties, and they conduct or

retain little heat into the building. Thus, it may be observed that the houses and the building material in the region are influenced by the environment of that region.

13. B

The mid-latitude desert is an extremely dry, arid area lying between 30 and 60 degrees north and south of the equator. These deserts are in the interiors of the continents. In certain areas, precipitation and humidity levels are exceedingly low.

The mid-latitude desert may be found across Asia, with large portions in the northern Gobi Desert and north-western TaklaMakan desert (China), Kazakhstan, and Uzbekistan. The climate in the interior western United States (Southern Utah and Nevada, Arizona, and New Mexico) is a mid-latitude desert climate.

The temperate zone, which is colder than the tropical and subtropical zones, is home to the mid-latitude deserts. As a result, high air pressure and low moisture occur in these deserts, which are the primary causes of low precipitation.

Many of the mid-latitude deserts are found on plateaus and are located a long distance from the sea. These include the Central Asian deserts of Kyzyl Kum, Turkestan, Taklamakan, and Gobi, as well as drier areas of the Great Basin Desert in the western United States.

Not all mid latitude deserts are the result of continentality. The Patagonian Desert of Argentina exists because of its rain-shadow position on the leeward side of the steep Andes, rather than because of its continentality.



<p>14.</p>	<p>C</p> <p>Features of Coniferous forests are as follows:</p> <ol style="list-style-type: none"> 1. Coniferous forests are of moderate density. Unlike the equatorial rain forests which are luxuriant and contain trees of various heights, the coniferous forests are more uniform and grow straight and tall, up to a height of about 100 feet. Where the poleward limit of tree growth is approached the trees are widely spaced and give way to tundra vegetation. 2. Almost all conifers are evergreen. The low annual temperature with more than half the year below the growing-point temperature of 43 degrees F, means that evergreens are at an advantage. Growth can begin as soon as growing-point is reached in spring. The conifer has a two-year fructification cycle. The seeds are pollinated in one year and dispersed in the following year. There is no annual replacement of new leaves as in deciduous trees. The same leaf remains on the tree for as long as five years. Food is stored in the trunks, and the bark is thick to protect the trunk from excessive cold. 3. Conifers are conical in shape. This is another adaption to survive the sub-Arctic climate. The sloping branches prevent snow accumulation which may snap the branches. It also offers little grip to the winds. 4. Leaves are small, thick, leathery and needle-shaped. This is to check excessive transpiration. The leaf surface is reduced to the minimum, as transpiration can be quite rapid in the warm summer due to intense continental heating. 5. There is little undergrowth. The podzolized soils of the coniferous forests are poor. They are excessively leached and very acidic. The evergreen leaves provide little leaf-fall for humus 	<p>formation, and the rate of decomposition of the leathery 'needles' in a region of such low temperature is slow. All these factors are deterrents to the growth of much under-growth. Absence of direct sunlight and the short duration of summer are other contributory factors to a sparse undergrowth, but where trees are widely spaced near the tree-line, heath and tundra plants cover the intervening ground.</p> <p>15. B</p> <p>High temperature and abundant rainfall in the equatorial regions support a luxuriant type of vegetation-the tropical rain forest. In the Amazon lowlands, the forest is so dense and so complete in vegetational extravagance that a special term 'selvas' is used.</p> <p>Unlike the temperate regions, growing season here is all the year round-seeding, flowering, fruiting and decaying do not take place in a seasonal pattern, so some trees may be in flower while others only a few yards away may be bearing fruit. There is neither drought nor cold to check growth in any part of the year.</p> <p>Many parts of the virgin tropical rain forests have been cleared either for lumbering or shifting cultivation. When these clearings are abandoned, less luxuriant secondary forests called belukar in Malaysia, Singapore and Indonesia, spring up. These are characterized by short trees and very dense under-growth. In the coastal areas and brackish swamps mangrove forests thrive.</p> <p>16. D</p> <p>The major structural components in the earth that are separated by sharp discontinuities are the crust, the mantle, and the core. The crust forms a very thin surface skin, the mantle is a thick shell that extends half the radius down into the earth, and the core occupies the central part. The crust and upper mantle are known to vary in physical and chemical</p>
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<p>characteristics, both horizontally and vertically; the lower mantle and core are generally assumed to be uniform because their diagnostic geophysical phenomena are masked by the physical properties of the upper layers.</p> <p>Evidence on the structure and composition of the earth's interior comes from (1) observations of surface rocks, (2) geophysical data from earthquakes, flow of heat from the interior, the magnetic field, and gravity, (3) laboratory experiments on surface rocks and minerals, and (4) comparison of the earth with other planets, the sun and other stars, and meteorites.</p> <p>17. B</p> <p>Moons (or natural satellites) are generally solid bodies, and few have atmospheres. Of the terrestrial planets, neither Mercury nor Venus have any moons at all, Earth has one and Mars has its two moons.</p> <p>In recent decades, the number of confirmed moons has steadily increased as telescopes and analysis methods have stepped up in sensitivity. Since Jupiter is closer, astronomers are able spot much smaller moons. But the latest study suggests that, ultimately, Saturn has more moons than Jupiter.</p> <p>In May 2023, Saturn had the largest number of moons (145) followed by Jupiter (95), Uranus (27) and Neptune (14). The largest satellite in the Solar system is Jupiter's Ganymede (bigger than the planet Mercury), followed by Saturn's Titan.</p>	<p>accretion, and compression of space rocks) caused the ball to get even hotter. Eventually, after about 500 million years, our young planet's temperature heated to the melting point of iron-about 1,538° Celsius (2,800° Fahrenheit). This pivotal moment in Earth's history is called the iron catastrophe. The iron catastrophe allowed greater, more rapid movement of Earth's molten, rocky material. Relatively buoyant material, such as silicates, water, and even air, stayed close to the planet's exterior. These materials became the early mantle and crust. Droplets of iron, nickel, and other heavy metals gravitated to the center of Earth, becoming the early core. This important process is called planetary differentiation. Earth's core is the furnace of the geothermal gradient. The geothermal gradient measures the increase of heat and pressure in Earth's interior. The geothermal gradient is about 25° Celsius per kilometer of depth (1° Fahrenheit per 70 feet). The primary contributors to heat in the core are the decay of radioactive elements, leftover heat from planetary formation, and heat released as the liquid outer core solidifies near its boundary with the inner core.</p> <p>On the whole, the core is almost entirely made of metals. Apart from Fe and Ni (NiFe), it comprises elements that dissolve in iron: gold, platinum and cobalt. New research confirmed in 2015 that the core has 90% of the Earth's Sulfur., thus explaining a geologic mystery: If the core was primarily NiFe, why wasn't it heavier? The core's density is double that of the mantle but the core's volume and mass is 16% and 32% of the Earth's volume and mass respectively. While its outer core (between 2900 and 5100 km below the surface) is molten, its inner core (from 5100 km deep to 6371 km at the earth's centre) is in solid state.</p>
<p>18. B</p> <p>Earth's core is the very hot, very dense center of our planet. The ball-shaped core lies beneath the cool, brittle crust and the mostly-solid mantle. The core is found about 2,900 kilometers below Earth's surface, and has a radius of about 3,485 kilometers. Planet Earth is older than the core. When Earth was formed about 4.5 billion years ago, it was a uniform ball of hot rock. Radioactive decay and leftover heat from planetary formation (the collision,</p>	<p>19. C</p> <p>The geological timescale has been divided on the basis of definite events that marked a major change in earth's physical, chemical and biological features. The</p>

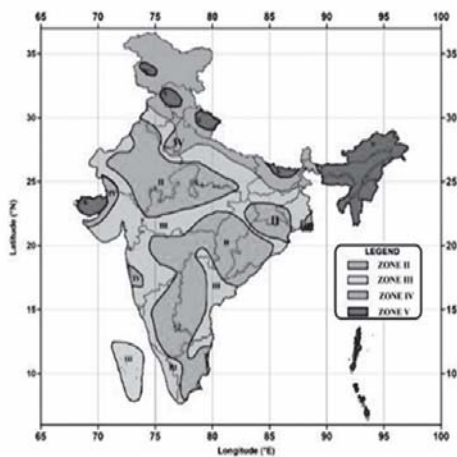
<p>20. C</p> <p>geological time is primarily divided into four eons. Each eon is divided into eras, each era is further divided into periods and each period is sub-divided into epochs.</p> <p>Various theories for the origin of Earth have developed over the period of time. The early theories were the Gaseous hypothesis of Kant, the Nebular Hypothesis of Laplace, the Planetesimal hypothesis of Chamberlin, Jean and Jeffery's tidal theory/Gravitational Theory, Russel's binary star hypothesis, Hoyle's supernova hypothesis, and Schmidt's interstellar hypothesis.</p> <p>The gaseous hypothesis of Kant- Immanuel Kant, a German philosopher, proposed his own theory regarding the origin of the earth in 1755, which was based on Newton's law of gravity. Kant believed that the original substance was initially distributed and was made up of cold, unmoving, solid particles. It clashed with each other because of gravity, which produced heat, which induced angular momentum, and it began to rotate. Later, it evolved into a hot nebula that began rotating, causing the speed to progressively increase. This rotation resulted in a strong centrifugal force, which produced rings of matter, which cooled to become planets and satellites.</p> <p>Nebular Hypothesis of Laplace- Kant's theory was revised in 1976 by mathematician Laplace. According to the nebular hypothesis, the Sun was encircled by a solar nebula made up primarily of hydrogen and helium, as well as dust. The development of a disk-shaped cloud is caused by particle impact and friction. Planets were formed from material associated with the young sun as a result of the accretion process.</p> <p>Schmidt's interstellar hypothesis- According to this theory, the primordial dust began to coalesce into a disk-shaped configuration as it moved at a high pace. These disk-shaped nebulae were further subdivided into rings, each holding asteroids that eventually merged into planets.</p>	<p>21. B</p> <p>Subsidence Theory of Darwin was given by Darwin for explaining the formation of Coral reefs and it is not related to formation of Earth.</p> <p>A mid-ocean ridge (MOR) is a seafloor mountain system formed by plate tectonics. It typically has a depth of about 2,600 meters and rises about 2,000 meters above the deepest portion of an ocean basin. This feature is where seafloor spreading takes place along a divergent plate boundary. The rate of seafloor spreading determines the morphology of the crest of the mid-ocean ridge and its width in an ocean basin. The production of new seafloor and oceanic lithosphere results from mantle upwelling in response to plate separation. The melt rises as magma at the linear weakness between the separating plates, and emerges as lava, creating new oceanic crust and lithosphere upon cooling. The first discovered mid-ocean ridge was the Mid-Atlantic Ridge, which is a spreading center that bisects the North and South Atlantic basins; hence the origin of the name 'mid-ocean ridge'. Most oceanic spreading centers are not in the middle of their hosting ocean basin but are traditionally called mid-ocean ridges. Mid-ocean ridges around the globe are linked by plate tectonic boundaries and the trace of the ridges across the ocean floor appears similar to the seam of a baseball. The mid-ocean ridge system thus is the longest mountain range on Earth, reaching about 65,000 km.</p> <p>The oceanic lithosphere is formed at an oceanic ridge, while the lithosphere is subducted back into the asthenosphere at ocean trenches. Two processes, ridge-push and slab pull, are thought to be responsible for spreading at mid-ocean ridges. Ridge push refers to the gravitation sliding of the ocean plate that is raised above the hotter asthenosphere, thus creating a body force causing sliding of the plate downslope. In slab pull the weight of a tectonic plate being subducted (pulled) below an overlying plate</p>
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<p>at a subduction zone drags the rest of the plate along behind it. The slab pull mechanism is considered to be contributing more than the ridge push.</p> <p>22. B</p> <p>Other than heat and light, the Sun sends lots of energy and small particles (solar wind). The Earth's magnetic field shields us from most of the energy and particles. When a solar storm (i.e., more intense eruption of solar wind) occurs, some of the energy and small particles can travel down the magnetic field lines at the north and south poles into Earth's atmosphere. The particles interact with atmospheric gases resulting in a colourful show of light in the sky, called aurora. In the North pole, it is called 'aurora borealis or Northern Lights' and in South pole, it is called 'aurora australis or Southern Lights'.</p> <p>Though it was Italian astronomer Galileo Galilei who coined the name "aurora borealis" in 1619 - after the Roman goddess of dawn, Aurora, and the Greek god of the north wind, Boreas - the earliest suspected record of the northern lights is in a 30,000-year-old cave painting in France.</p> <p>Auroras occur on other planets, too - all that's required to make an aurora is an atmosphere and a magnetic field. Auroras have been seen in the atmospheres of all the gas giant planets, which is not surprising, since these planets all have robust magnetic fields. Jupiter's magnetic field is 20,000 times stronger than that of Earth, so the giant planet's auroras are far brighter than the ones that blaze in our skies. And the Jupiter lights aren't just driven by the solar wind: Most of the particles that cause the planet's auroras are blasted into space by its close-orbiting moon Io, the most volcanic body in the solar system. More surprisingly, auroras have also been discovered on both Venus and Mars, both of which have very weak magnetic fields.</p>	<p>23. A</p> <p>The Kuiper Belt (also known as the Edgeworth-Kuiper belt) is a region of the Solar System that exists beyond the eight major planets, extending from the orbit of Neptune (at 30 AU) to approximately 50 AU from the Sun. (1 Astronomical Unit (AU) = distance between the Earth and the Sun).</p> <p>It is similar to the asteroid belt, in that it contains many small bodies, all remnants from the Solar System's formation. While many asteroids are composed primarily of rock and metal, most Kuiper belt objects are composed largely of frozen volatiles (termed "ices"), such as methane, ammonia, and water. The Kuiper belt is home to most of the objects that astronomers generally accept as dwarf planets: Orcus, Pluto, Haumea, Quaoar, and Makemake. Some of the Solar System's moons, such as Neptune's Triton and Saturn's Phoebe, may have originated in the region.</p> <p>24. B</p> <p>A supermoon is a full moon or a new moon that nearly coincides with perigee-the closest that the Moon comes to the Earth in its elliptic orbit-resulting in a slightly larger-than-usual apparent size of the lunar disk as viewed from Earth. The technical name is a perigee syzygy (of the Earth-Moon-Sun system) or a full (or new) Moon around perigee. At this point, the moon is observed to be 30 per cent brighter and appears 14 per cent larger. But such difference cannot be seen with the naked eye.</p> <p>The real association of the Moon with both oceanic and crustal tides has led to claims that the supermoon phenomenon may be associated with increased risk of events like earthquakes and volcanic eruptions, but no such link has been found.</p> <p>The opposite phenomenon, an apogee syzygy or a full (or new) Moon around apogee, has been called a micromoon.</p> <p>25. B</p> <p>The Sun's surface has electrically charged hot gases that generate magnetic fields. In</p>
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<p>what is known as Solar activity, the Sun's gases constantly move, which tangles, stretches and twists the magnetic fields. Sunspots, solar flares, solar wind and coronal mass ejections are all associated with solar activity.</p> <p>Sunspots are dark, cooler areas on the Sun's surface and arise due to disturbances in the Sun's magnetic field. They are dark because they are cooler, and they are cooler because strong magnetic fields keep the Sun's interior heat from reaching its surface. The magnetic field lines near sunspots often become too tangled and re-aligned. Like a rubber band that snaps when it is twisted too far, the tangled magnetic fields release energy when they snap. Such energy release is called a solar flare, a sudden, intense brightening of a region on the Sun lasting several minutes to hours. A strong solar flare can temporarily disrupt radio communications on Earth.</p> <p>Intense solar flares are often accompanied by solar storms or Coronal Mass Ejections (CMEs), an immense cloud of magnetized particles hurled into space. While solar flares travel at the speed of light, the CMEs travel at slower pace and take several hours or even days to reach Earth. The CMEs can short-circuit satellites and power grids on Earth and expose astronauts to excessive radiation. In 1989, a CME accompanied a solar flare that hit Earth, pushing the entire province of Quebec, Canada, into an electrical blackout.</p> <p>During periods of maximum solar activity, events like solar wind, solar flare and CMEs are strongest and most frequent. Charged particles during such events slam into the Earth's upper atmosphere. But these particles are redirected toward the Earth's poles by its magnetic field which protects the Earth from solar activity. When these particles interact with O₂ and N₂ of the Earth's upper atmosphere near the poles, they cause an aurora, a colourful show of light in the sky. They are called 'aurora borealis or Northern Lights' in the North pole, and 'aurora australis or Southern</p>	<p>Lights' in the South pole. Auroras occur on other planets as well, especially all the giant gas planets because they have a thick, deep atmosphere and a strong magnetic field.</p> <p>26. D</p> <p>Although we know that the core is the hottest part of our planet, its precise temperatures are difficult to determine. The fluctuating temperatures in the core depend on pressure, the rotation of the Earth, and the varying composition of core elements. In general, temperatures range from about 4,400° Celsius (7,952° Fahrenheit) to about 6,000° Celsius (10,800° Fahrenheit). The core is made of two layers: the outer core, which borders the mantle, and the inner core. The boundary separating these regions is called the Bullen discontinuity. The outer core, about 2,200 kilometers thick, is mostly composed of liquid iron and nickel. The NiFe alloy of the outer core is very hot, between 4,500° and 5,500° Celsius (8,132° and 9,932° Fahrenheit). The liquid metal of the outer core has very low viscosity, meaning it is easily deformed and malleable. It is the site of violent convection. The churning metal of the outer core creates and sustains Earth's magnetic field. The hottest part of the core is actually the Bullen discontinuity, where temperatures reach 6,000° Celsius (10,800° Fahrenheit)-as hot as the surface of the sun.</p> <p>The inner core is a hot, dense ball of (mostly) iron. It has a radius of about 1,220 kilometers. Temperature in the inner core is about 5,200° Celsius (9,392° Fahrenheit). The pressure is nearly 3.6 million atmosphere (atm). The temperature of the inner core is far above the melting point of iron. However, unlike the outer core, the inner core is not liquid or even molten. The inner core's intense pressure-the entire rest of the planet and its atmosphere-prevents the iron from melting. The pressure and density are simply too great for the iron atoms to move into a liquid state.</p>
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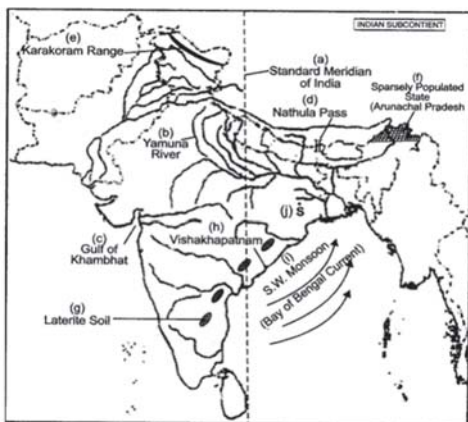
<p>27.</p>	<p>A</p> <p>NASA's Artemis mission is touted as the next generation of lunar exploration and is named after the twin sister of Apollo from Greek mythology. Artemis is also the goddess of the moon. It is the first in a series of increasingly complex missions that will enable human exploration to the Moon and Mars. With the Artemis programme, NASA aims to land humans on the moon by 2024, and it also plans to land the first woman and first person of colour on the moon. NASA will establish an Artemis Base Camp on the surface and a gateway (the lunar outpost around the Moon) in lunar orbit to aid exploration by robots and astronauts. The gateway is a critical component of NASA's sustainable lunar operations and will serve as a multi-purpose outpost orbiting the moon.</p>	<p>extinction. Different asteroid deflection strategies were proposed; Double Asteroid Redirection Test was launched in 2021.</p>
<p>28.</p>	<p>A</p> <p>An asteroid is a minor planet of the inner Solar System. They are metallic or rocky bodies without atmospheres. The size and shapes of asteroids vary significantly, including even dwarf planets, but not planets.</p> <p>Of the roughly one million known asteroids the great number of them are located between the orbits of Mars and Jupiter, approximately 2 to 4 AU from the Sun, in the main asteroid belt. Asteroids are generally classified to be of three types: C-type, M-type, and S-type. These were named after and are generally identified with carbonaceous, metallic, and siliceous compositions, respectively. The sizes of asteroids varies greatly; the largest, Ceres, is almost 1,000 km across and qualifies as a dwarf planet. The total mass of all the asteroids combined is less than that of Earth's Moon. The majority of main belt asteroids follow slightly elliptical, stable orbits, revolving in the same direction as the Earth and taking from three to six years to complete a full circuit of the Sun.</p> <p>Near-Earth asteroids can threaten all life on the planet; an asteroid impact event resulted in the Cretaceous-Paleogene</p>	<p>29. A</p> <p>Oxygen and silicon are the most common elements in the crust. The Earth's crust consists of both oceanic crust and continental crust.</p> <p>30. C</p> <p>Isostasy or isostatic equilibrium is the state of gravitational equilibrium between Earth's crust and mantle such that the crust "floats" at an elevation that depends on its thickness and density. Isostasy is a fundamental concept in the Geology. It is the idea that the lighter crust must be floating on the denser underlying mantle. It is invoked to explain how different topographic heights can exist on the Earth's surface. Isostatic equilibrium is an ideal state where the crust and mantle would settle into in absence of disturbing forces. The waxing and waning of ice sheets, erosion, sedimentation, and extrusive volcanism are examples of processes that disturbs isostasy. The physical properties of the lithosphere (the rocky shell that forms Earth's exterior) are affected by the way the mantle and crust respond to these perturbations. Theory of Isostasy was developed from gravity surveys in the mountains of India, in 1850. The term was first proposed by Clarence Dutton, an American geologist in 1889.</p> <p>31. A</p> <p>Around 59% of India is prone to earthquakes of different intensities, minister of state for science and technology and earth sciences informed the Lok Sabha in the Monsoon session of 2021. As per the seismic zoning map of the country, the total area is classified into four seismic zones. Zone V is seismically the most active region, while zone II is the least because the erstwhile Zone I has been merged to Zone II in the latest seismic zoning of India. Approximately, 11% area of the country falls</p>

in zone V, 18% in zone IV, 30% in zone III and remaining in zone II. According to the earthquake zonation map of India (shown below), Tezpur in Assam falls under Zone V, Shimla in Himachal Pradesh falls under Zone IV, Kohima in Nagaland falls under Zone V and Mangalore in Karnataka falls under Zone III.



32. B

As evident from the map of India given below Standard Meridian of India (82.5 degree longitude line) passes through Mahanadi river in Odisha and Son river in Madhya Pradesh. The Standard Meridian does not pass through Rajmahal hills in Jharkhand.



33. D

Recently launched, deep Ocean mission (informally known as Samudrayaan program) is an Indian initiative to undertake the deep ocean exploration focused on India's exclusive economic zones and continental shelf. The program will consist of various manned and unmanned submersibles exploring the sea bed. The primary aim of the mission is to explore and extract polymetallic nodules which are composed of minerals like manganese, nickel, cobalt, copper and iron hydroxide. The objectives of the plan include research work that can result in formation of a roadmap on climate change and help in developing a desalination plant powered by tidal energy.

India was the first country in the world, to have sponsored the exploration of deep sea mineral viz polymetallic nodules, in the central Indian Ocean basin in 1987. In 1987, India gained the status of a 'Pioneer Investor' and was the first country to be acknowledged with this status. It was then given an area of 1.5 lakh sq. kilometer for the mining of poly metallic nodule.

34. D

The breaks in channel gradient caused by rejuvenation (due to land upliftment or fall in sea level) are called knick points. These breaks in channel gradient or knickpoints denote sudden drops of elevation in the longitudinal profile of the rivers and allow the water to fall down vertically giving birth to waterfalls of varying dimensions.

Hundru falls (76.67 m) on the Subarnarekha river (near Ranchi city), Jonha or Gautamdihara falls at the confluence of the Raru and the Gunga rivers (to the east of Ranchi), Dasam falls (39.62 m and 15.24 m) on the Kanchi river (east of Ranchi), Dhunwadhar falls on the Narmada river (near Jabalpur, M.P.), major falls of Rewa plateau (e.g. Chachai falls-127 m on the Bihar nadi, Tons or Purwa falls-75m on the Tons river etc.) etc. are the

examples of knick point waterfalls.

Rajroppa waterfalls are called "hanging valley waterfalls" which are formed when a tributary stream joins the main stream from a great height. Rajroppa falls were formed when the Bhera stream descending from the Ranchi plateau joins and hangs above the Damodar river at its confluence with the Damodar river.

35. **A**

Zaskar range separate from the great Himalayan Range runs parallel to it. Ladakh range is in the north of the Zaskar range which also runs parallel to it. This range is having the average elevation of the 5,800 mt. above sea level and it is about 300 km long, only few peaks of this range attain height of over 6000 mt. Kamet Peak (25,446 feet [7,756 metres]) is the highest point of Zaskar range. Kailash range is a branch of the Ladakh range which is situated in the western Tibet.



36. **D**

Besides the Arabian Sea and Bay of Bengal islands India has a number of islands along the western and eastern coast.

Sri Harikota island is situated in the Pulicat lake along the coast of Andhra Pradesh.

Parikund island is situated in Chilka lake, Odisha.

37. **D**

St. Mary island is situated on the Karnataka coast near Udupi.

The Eastern Ghats include several discontinuous and dissimilar hill masses that generally trend northeast-southwest along the Bay of Bengal. The narrow range has an average elevation of about 2,000 feet (600 metres), with peaks reaching 4,000 feet (1,200 metres) and higher; the high point is Arma Konda (5,512 feet [1,680 metres]) in Andhra Pradesh state. There is a gap in the chain 100 miles (160 km) wide through which the Krishna and Godavari rivers reach the coast; the Godavari runs through a gorge 40 miles (65 km) long. Farther southwest, beyond the Krishna River, the Eastern Ghats appear as a series of low ranges and hills. Southwest of Chennai, the Eastern Ghats continue as the Javadi and Shevaroy hills, beyond which they merge with the Western Ghats.

38. **C**

The Eastern Ghats are older than the Western Ghats, and have a complex geologic history related to the assembly and breakup of the ancient supercontinent of Rodinia and the assembly of the Gondwana supercontinent.

State-owned ONGC recently said it will implement India's maiden geothermal field development project in Ladakh that will use the heat generated by the Earth's core to generate clean energy.

The Geological Society of India (GSI) identified 400 hot springs that have been used to estimate the heat flow and geothermal gradients throughout India. Several geothermal provinces have been identified in India. Indian East coast is not included in the geothermal province while the west coast continental margin is a geothermal province in India. Major geothermal provinces of India are shown in the map below:



39. **D**

The most important range of the Trans Himalayas is Karakoram range which is called as the 'back bone of High Asia'. It determines India's frontiers with Afghanistan and China. It has many lofty peaks and large glaciers.

Siachen is glacier of Nubra valley. At 76 km long, it is the longest glacier in the Karakoram and second-longest in the world's non-polar areas. Baltaro is glacier of Shigar valley. Batura is glacier of Hunza valley.

40. **C**

Telengana Plateau comprises the northeastern part of the Deccan plateau. The Telengana Plateau has an area of about 57,370 square miles (148,000 square km), a north-south length of about 480 miles (770 km), and an east-west width of about 320 miles (515 km).

Geologically, the plateau is chiefly composed of ancient Precambrian gneiss. Its nearly fully eroded peneplain is marked by undulations, almost completely graded valleys, and monadnocks that range from hill groups to tors and arrangements of massive boulders. The plateau is drained by the Godavari River taking a southeasterly course; by the Krishna River, which divides the peneplain into two regions.

41. **A**

The Gondawanas appear in the Godavari basin while northern and western parts are covered by Trappean lava, that is, Basaltic lava.

The Arakan Mountains are a mountain range in western Myanmar, between the coast of Rakhine State and the Central Myanmar Basin, in which flows the Irrawaddy River. It is the most prominent of a series of parallel ridges that arc through Assam, Nagaland, Manipur, Mizoram and Myanmar.

The Arakan Mountains run from Cape Negrais (Myanmar) in the south into Manipur in the north. They include the Naga Hills, the Chin Hills, and the Patkai range which includes the Lushai Hills. The mountain chain is submerged in the Bay of Bengal for a long stretch and emerges again in the form of the Andaman and Nicobar Islands.

Arakan Mountains function as a climatic barrier, cutting off the southwestern monsoon rains from central Myanmar.

42. **B**

Recently Wadia Institute of Himalayan Geology, an autonomous institute under the Department of Science & Technology, Govt. of India, which investigated and characterised the gas emissions from Himalayan geothermal springs, found that these springs which cover about 10,000 square km in the Garhwal region of Himalaya, show a significant discharge of Carbon dioxide (CO₂) rich water.

The study published in the scientific journal Environmental Science and Pollution Research suggested that CO₂ in these thermal springs are sourced from metamorphic decarbonation of carbonate rocks present deep in the Himalayan core along with magmatism and oxidation of graphite. Most of the geothermal water is dominated by evaporation followed by weathering of silicate rocks.

<p>(iii) Lack of proper transport and infrastructure facilities;</p> <p>(iv) Over-utilisation due to unregulated grazing;</p> <p>(v) Depletion of forests through fire;</p> <p>(vi) Poor and unscientific methods of felling, fashioning and seasoning;</p> <p>(vii) Unscientific economic activities like slash and burn manner of agriculture which destroy the fragile forest cover of slopes;</p> <p>(viii) Reliance on static conservancy, i.e., natural growth, rather than regenerating through afforestation;</p> <p>(ix) Lack of information on forest resources and inadequate research facilities;</p> <p>(x) Degradation of forest covers due to industrial and irrigation projects, illegal felling or 'poaching' etc.</p> <p>49. A</p> <p>Ethanol is an anhydrous ethyl alcohol (C₂H₅OH) and can be produced from sugarcane, maize, wheat, etc., that have high starch content. Blending ethanol with petrol can significantly reduce the vehicle's emission of CO and CO₂, because oxygen in ethanol helps the engine combust the fuel more completely. The CO₂ released when ethanol is used in vehicles is offset by the CO₂ captured when the crops that are used to make ethanol are grown.</p> <p>Ethanol Blended Petrol (EBP) Programme was launched in 2003 by the Ministry of Petroleum & Natural Gas (MoP&NG) to supply petrol blended with 5% ethanol in 9 States (Maharashtra, Gujarat, Goa, UP, Haryana, Punjab, Karnataka, AP, TN). In 2006, the Ministry directed the Oil Marketing Companies (OMCs) such as IOCL, HPCL and BPCL to implement the EBP program in 20 notified states.</p> <p>The National Policy on Biofuels, 2018 set a target of blending 20% ethanol in petrol (called E20) by 2030. Towards this goal, in April 2019, the EBP program was extended across the country, and the OMCs were to</p>	<p>sell petrol blended with 10% ethanol (called E10) by 2022. However, India has achieved the target of 10% ethanol blending in petrol, ahead of schedule, that is, November 2022.</p> <p>In May 2022, the National Biofuel Policy 2018 was amended for advancing the deadline for E20 target from 2030 to 2025. A 10% blending of petrol does not require major changes to the vehicle engines but a 20% blend require some changes in engines and may even drive up their prices.</p> <p>50. B</p> <p>Forests in India provide a number of products which are used for domestic and industrial purposes. These products may be classified into major and minor products.</p> <p>Section 2(i) of the Forest Rights Act defines a Minor Forest Produce (MFP) as all non-timber forest produce of plant origin including bamboo, brushwood, stumps, canes, cocoon, honey, waxes, Lac, tendu/kendu leaves, medicinal plants etc. A number of people from Scheduled Tribes and other forest-dwelling communities depend on the collection and sale of such items for their livelihood.</p> <p>Rosewood and Ebony are major forest produce found in evergreen forests.</p> <p>51. D</p> <p>Shola forests are tropical montane forest patches found within the valleys separated by grasslands only at elevations above 1600 meters. It is found exclusively in South India, especially within the Southern Western Ghats. The shola forests are patches of forests that occur within the valleys. Grasslands cover the other parts of the mountains. The trees never grow on the open, exposed mountain tops. This is a really unique landscape formation that is found only in the southern Western Ghats. The word "Shola" comes from the Tamil word which means grove.</p> <p>52. D</p> <p>The Government of India constituted the Cauvery Water Disputes Tribunal (CWDT) on June 2, 1990, to adjudicate the water</p>
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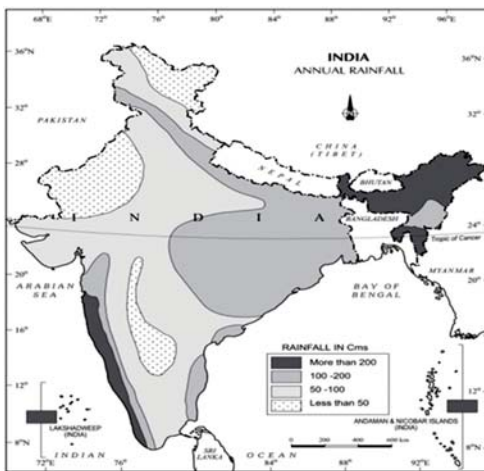
<p>53. C</p>	<p>dispute between the states of Tamil Nadu, Karnataka, Kerala and the union territory Puducherry with respect to the inter-state Cauvery water and river basin.</p> <p>Rajasthan is rich in minerals. It has 79 mineral varieties out of which 58 minerals are commercially subjugated. Rajasthan has effective domination in the manufacturing of major minerals like Lead-Zinc, Wollastonite, Gypsum, Calcite, Ochre, Silver, Rock phosphate and other minerals like Sandstone, Serpentine, Marble, etc., that contributes around ninety percent to hundred percent of national production.</p> <p>Rajasthan constitutes around 96% of India's entire asbestos production. Asbestos is obtained from the rocks of the Aravalli, Delhi and Bhilwara.</p> <p>Largest reserves of copper ore (53.81%) are in Rajasthan followed by Jharkhand (19.54%) and Madhya Pradesh (18.75%). But Madhya Pradesh is the leading producer of copper concentrates, accounting for about 51% of the production, followed by Rajasthan with 42% and Jharkhand with 7% production.</p> <p>Rajasthan is the leading producer (21%) of limestone. The major production of Silver in India comes from "Zawar mines" in Udaipur (Rajasthan). Here Silver is obtained as a by-product of Galena ore (lead) in Hindustan Zinc Smelter.</p>	<p>Examples are Babool, ber and wild date palm, Khair, neem, Khejri, palas, etc. Some of these plants are used as charcoal for cooking and also fodder from the forest acts as an important source of food for cattle. The leaves are mostly thick and small to minimize evaporation and stems are succulent to conserve water.</p> <p>Rosewood and Kusum varieties of tree are not found in Tropical thorn forests.</p> <p>55. C</p> <p>The Himachal Pradesh government began the construction of the proposed Renuka Ji dam in December 2022. Renuka Ji dam is a national project conceived as a storage project on Giri river, a tributary of Yamuna River, in Sirmaur district of Himachal Pradesh.</p> <p>The Detailed Project Report (DPR) of the Renuka Ji dam was accepted by the Technical Advisory Committee (TAC) of the Department of Water Resources in 2000 for a total price of Rs 1,224.64 crore. However, the project could not progress much owing to some reasons. The DPR of the project with an estimated cost of Rs.4,596.76 crore was again accepted by the TAC in 2015. However, due to the non-signing of the Interstate Agreement between beneficiary states, the work on the project could not be started. After vigorous pursuance by the Government of India, the Interstate Agreement among six beneficiary states viz. Delhi, Haryana, Uttar Pradesh, Rajasthan, Uttarakhand and Himachal Pradesh was signed on January 9, 2019. After the signing of the agreement, the DPR was once again accepted by the TAC of the Ministry of Jal Shakti on December 9, 2019 for Rs 6,946.99 crore. Of the projected cost, the Union government will bear 90 per cent of the expenditure.</p> <p>The project envisages the construction of a 148-metre-high rock-fill dam, among others. Once complete, it will fulfil about 40 per cent of the drinking water requirement of Delhi. The project will also generate 200 million units of energy.</p>
<p>54. B</p>	<p>Tropical thorn forest in India is a type of desert forest type which has scrub-like vegetation. Their trees and plant are armed with thorns and spines.</p> <p>These forests are found in the region where the rainfall is less than 50 cm annually. The tree and plants in these regions have long roots that penetrate deep into the soil to get water from the deep. These forests are in South-West Punjab, Haryana, Rajasthan, Gujarat, Madya Pradesh, and Uttar Pradesh.</p>	

<p>56.</p>	<p>B</p> <p>Geological Survey of India (GSI) is actively engaged in geological mapping followed by mineral exploration (survey) for various mineral commodities including gold. Reserves of gold ore (primary) are located in:</p> <ol style="list-style-type: none"> 1. Bihar (45%) 2. Rajasthan (23%) 3. Karnataka (22%) 4. West Bengal (3%) 5. Andhra Pradesh (2%) 6. Telangana (2%) 7. Madhya Pradesh (2%) <p>However, Karnataka is the largest producer (80%) of gold in the country, partly because the gold ore in Karnataka has greater metal content. Karnataka's Kolar and Hutti gold fields and AP's Ramgiri Gold Field are most important gold mines. In Kerala, the river terraces along the Punna Puzha and the Chabiyar Puzha have some alluvial gold.</p>	<p>April 6, 2022. This project has 5 MTPA capacity. But both projects faced huge resistance, as locals are protesting against the coal mine. The Rajasthan government is also trying to speed up the process of getting final clearance for the third project-Kente Extension-with 9 MTPA capacity that it also allocated in 2015.</p> <p>58. D</p> <p>The Alpine forests occur all along the Himalayas at altitudes ranging between 2,900 to 3,500 m or even up-to 3800 m above sea level, depending upon the location and the variety of species. These forests can be divided into: (1) sub-alpine; (2) moist alpine scrub and (3) dry alpine scrub.</p> <p>The sub- alpine forests occur at the upper limit of tree forest adjoining alpine scrub and grasslands and comprise of dense growth of small crooked trees and large shrubs with coniferous overwood. It is a mixture of coniferous and broad-leaved trees in which the coniferous trees attain a height of about 30 m while the broad leaved trees reach only 10 m. Fir, kail, spruce, rhododendron, plum, yew, etc. are important species.</p> <p>The moist alpine scrub is a low evergreen dense growth of rhododendron, birch, berberis and honeysuckle which occurs from 3,000 metres and extends upto snowline. The dry alpine scrub is the uppermost limit of scrub xerophytic, dwarf shrubs, over 3,500 metres above sea level and found in dry zone. Juniper, honeysuckle, artemesia, potentilla, etc. are important species.</p> <p>In Western Himalayas Alpine species with white flowers - the Brahmakamal is utilized in perfumery. It is a species of flowering plant native to the Himalayas, Himachal Pradesh and Uttarakhand (India), Mongolia, Burma and southwest China. It is also the state flower of Uttarakhand.</p> <p>59. C</p> <p>India has launched its Coal Bed Methane (CBM) Blocks auction in September 2021 after a gap of almost 15 years. This carries</p>
<p>57.</p>	<p>A</p> <p>In Chhattisgarh, a protest is going on against coal mine projects in Hasdeo Arand-a dense forest spread across 1,70,000 hectares over three districts, Surajpur, Surguja and Korba. This decade-long protest escalated in March, when the Chhattisgarh government allowed the second phase of coal mining in an area of 1,136.328 hectares in Parsa East-Kete Basan (PEKB) coal mine.</p> <p>The first phase of mining, on 762 hectares of land, was completed in March 2022. A total of 2,711 hectares with 15 million tonnes per annum (MTPA) capacity, was allocated to Rajasthan Rajya Vidyut Utpadan Nigam Limited (RRVUNL) in 2007. With no coal supply from the mine now, the Rajasthan government began pressing the Chhattisgarh government for opening the second phase.</p> <p>Meanwhile, Chhattisgarh government also gave Stage II approval for another coal mining project in Parsa opencast coal block under Surajpur and Surguja districts on</p>	

<p>very liberal terms under new policy initiatives such as HELP, OALP and CBM.</p> <p>CBM, a natural gas which contains 90-95% methane, gets absorbed and stored in coal seams (i.e., bedded deposits of coal). India has a coal reserve of 285 billion tonnes, the world's fourth-largest coal reserves. and thus, holds significant prospects for exploration and exploitation of CBM.</p> <p>The progress in CBM so far has remained slow. Though India has CBM Prognosticated Resource of 92 TCF, in-place reserves established is 10 TCF only. The Government awarded 33 CBM blocks through four rounds of bidding between 2001 and 2008, but only five blocks have gone into commercial production. Other three blocks are under development and six still in exploration phase. The remaining allotted blocks are either relinquished or are under relinquishment.</p> <p>No new licence for CBM exploration was granted after 2010. Now the bidding process has started. Exploration, Discovery, Development, and Production commencement takes 5 to 7 years.</p> <p>CBM Projects need acquisition of large land areas for wells and surface facilities. The local socio-political issues sometimes delay the process. Environment and Forest Clearances take a long time. The Single Window System, though well intended, does not work at the field-level.</p> <p>60. A</p> <p>Recently, a one-man judicial commission, looking into allegations of illegal mining in Assam's Digboi forest division, has found that rat-hole mining, an unscientific and dangerous technique in which workers enter deep tunnels around 3-4 feet deep to extract coal, is flourishing unchecked in the region. Though rat-hole mining has been banned in neighbouring Meghalaya since 2014, numerous instances of it have been recorded there. The method itself has not been specifically outlawed in Assam. Another state where Rat hole mining is rampant is Meghalaya.</p>	<p>Rat hole mining involves digging of very small tunnels, usually only 3-4 feet high, which workers (often children) enter and extract coal. The National Green Tribunal (NGT) banned it in 2014, on grounds of it being unscientific and unsafe for workers. The Meghalayan government has challenged the NGT ban in the Supreme Court.</p> <p>According to available government data, Meghalaya has a total coal reserve of 640 million tonnes, most of which is mined unscientifically by individuals and communities. Since the coal seam is extremely thin in Meghalaya, no other method would be economically viable. Removal of rocks from the hilly terrain and putting up pillars inside the mine to prevent collapse would be costlier. In Meghalaya this is the locally developed technique and the most commonly used one.</p> <p>Due to rat hole mining, the water of many rivers, especially in Jaintia Hills district, have turned acidic. The water also has high concentration of sulphates, iron and toxic heavy metals, low dissolved oxygen (DO) and high BOD, showing its degraded quality.</p> <p>61. A</p> <p>The average annual rainfall in India is about 125 cm, but it has great spatial variations (as shown in map of India below).</p> <p>Areas of High Rainfall: The highest rainfall occurs along the west coast, on the Western Ghats, as well as in the sub-Himalayan areas is the northeast and the hills of Meghalaya. Here the rainfall exceeds 200 cm. In some parts of Khasi and Jaintia hills, the rainfall exceeds 1,000 cm. In the Brahmaputra valley and the adjoining hills, the rainfall is less than 200 cm.</p> <p>Areas of Medium Rainfall: Rainfall between 100-200 cm is received in the southern parts of Gujarat, east Tamil Nadu, northeastern Peninsula covering Odisha, Jharkhand, Bihar, eastern Madhya Pradesh, northern Ganga plain along the sub-Himalayas and the Cachar Valley and Manipur.</p>
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Areas of Low Rainfall: Western Uttar Pradesh, Delhi, Haryana, Punjab, Jammu and Kashmir, eastern Rajasthan, Gujarat and Deccan Plateau receive rainfall between 50-100 cm.

Areas of Inadequate Rainfall: Parts of the Peninsula, especially in Andhra Pradesh, Karnataka and Maharashtra, Ladakh and most of western Rajasthan receive rainfall below 50 cm.



62. B

In India, weather forecasts are of three main types with different lead time/validity periods, such as short range forecasts (1 to 3 days or 24 to 72 hours); medium range forecasts (04 to 10 days or 96 to 240 hours) and long/extended range forecasts (beyond 10 days or 240 hours). The India Meteorological Department (IMD) usually issues the last one category for a season. These are Southwest Monsoon rainfall and onset dates for Kerala, Northeast Monsoon rainfall and winter precipitation over Northwest India. Besides these three main forecast types, IMD also issues a shorter range forecast called 'nowcasting' to be valid for less than one day. The nowcasting service alerts people on weather phenomena like thunderstorms, hailstorms etc. which are short lived but highly disastrous.

63. B

A tropical cyclone is an extensive weather system, measuring several hundred miles, where the winds rotate around an area of low pressure, known as the eye. These large storms can build up for weeks and cause various levels of damage and destruction in their wake. For example, the strongest tropical cyclone on record was Typhoon Tip in 1979, which caused deaths, flooding and massive damage.

Tropical cyclones form over warm tropical ocean waters when the warm, moist ocean air rises. They cause high winds, rain and destruction in their wake. Tropical cyclones are the most common and include different intensities.

Tropical depression - less than 39 mph

Tropical storms - 39-74 mph

Hurricane or typhoon - 74 mph and over

While cyclones typically form over water, tornadoes are more of a land storm. Also known as twisters, tornadoes form when a low and a high pressure meet in the atmosphere, causing a swirling vortex of spinning air. That air then creates a funnel that descends from the storm. In addition to destruction from the winds, tornadoes have torrential rains, hail and powerful thunderstorms.

The practice of naming storms started in order to help in the quick identification of storms in warning messages because names are presumed to be far easier to remember than numbers and technical terms. Experience shows that the use of short, distinctive given names in written as well as spoken communications is quicker and less subject to error than the older more cumbersome latitude-longitude identification methods. Recent cyclone "Cyclone Titli" was named by Pakistan.

64. B

Indian Ocean Dipole (IOD) is something that happens in the Indian Ocean. It is an atmospheric-ocean-based phenomenon just like the El Nino and La Nina, where the

<p>temperatures of the sea surface waters get warmed up in the positive phase of IOD and get cooled up in the negative phase of IOD. The Indian Ocean Dipole, also known as Indian Nino, is actually the difference between sea surface temperature of the Arabian Sea that is the western part of the Indian Ocean, and the Bay of Bengal, the eastern part of the Indian Ocean.</p> <p>A positive IOD occurs when the sea surface temperatures are greater than normal in the Arabian Sea and less than normal in the tropical eastern Indian Ocean. When the reverse is the case, a negative IOD is said to have developed.</p> <p>IOD develops three phases, including a Positive phase, a Negative phase, and a Neutral Phase.</p> <p>Positive phase of the Indian Ocean Dipole is very favourable for higher monsoons in India. The positive IOD occurs due to the westerly winds getting weaker alongside the equator. This makes the warm water flow towards the African regions.</p> <p>Negative phase of the Indian Ocean Dipole is the opposite and obstructs the progress of monsoon in India. Negative IODs can accumulate and combine with the effects of El Nino to give rise to severe droughts caused in the Indian Subcontinent.</p> <p>In Neutral phase of Indian Ocean Dipole, the water flows from the Pacific in the South of the Indonesian islands to the northwest regions of Australia, keeping the sea waters warm. The westerly winds blow alongside the equator, and the air above this whole area rises and falls across the western halves of the Indian Ocean basin.</p> <p>In September 2023, the positive IOD brought 13% above the normal rains of the month and negated the adverse impact of El Nino on Indian monsoon in that month.</p> <p>65. C</p> <p>Popularly known as 'The Gateway to Ladakh', Dras is a hill station in the Kargil district of the Ladak union territory. Drass</p>	<p>is surely India's coldest inhabited place as its temperature regularly goes below -30°C in winter, way below the lowest temperatures of the nearby towns of Kargil (-23.6°C), Leh (-17.6°C) and Srinagar (-10°C). Drass is also considered as the world's second coldest inhabited place, after the Siberian town of Oymyakon. However, the Indian Meteorological Department does not have an observatory in Drass. It borrows data from the Indian Army, but does not publish it, as it can't authenticate those numbers.</p> <p>66. D</p> <p>Mawsynram is a town in the East Khasi Hills district of Meghalaya state in Northeastern India, 60.9 kilometres from Shillong, the state capital. Mawsynram receives the highest rainfall in India. It is reportedly the wettest place on Earth, with an average annual rainfall of 11,419 millimetres.</p> <p>Three reasons can be cited for high rainfall at Mawsynram:</p> <p>The warm moist winds of the northward-moving air from the Bay of Bengal during the monsoon, which cover an extensive area but are forced to converge into the narrower zone over the Khasi Hills, thus concentrating their moisture.</p> <p>The alignment of the Khasi Hills (east to west) places them directly in the path of the airflow from the Bay of Bengal, producing a significant uplift (plus cooling, further condensation and thus more rain).</p> <p>Finally, uplift over the Khasi Hills is virtually continuous in the monsoon period because the lifted air is constantly being pulled up by vigorous winds in the upper atmosphere; hence, the rainfall is more or less continuous.</p> <p>67. D</p> <p>Norwesters known by its more famous name Kalbaisakhi is local thunderstorm which is found mainly in the Northeastern</p>
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and Eastern parts of India. It is also prevalent in Bangladesh. The Indian states affected by this phenomenon are West Bengal, Assam, Chattisgarh, Bihar, Odisha, Jharkhand and the other seven North Eastern states of India. In Assam these thunderstorms are known as Bardoli Cheerha.

These thunderstorms are dreaded as they cause widespread devastation to infrastructure, property, human and animal life. However, these thunderstorms have some beneficial after effects. These thunderstorms cause rainfall which is useful for jute and rice cultivation in West Bengal. They are also useful for Tea cultivation in Assam. They start occurring from the month of March and their effect is pronounced in the month of April and May.

68. D

The Intertropical Convergence Zone (ITCZ), known by sailors as the doldrums or the calms because of its monotonous windless weather, is the area where the northeast and the southeast trade winds converge. It encircles Earth near the thermal equator though its specific position varies seasonally. When it lies near the geographic Equator, it is called the near-equatorial trough. Where the ITCZ is drawn into and merges with a monsoonal circulation, it is called a monsoon trough.

This is the region of ascending air, maximum clouds and heavy rainfall. The location of ITCZ shifts north and south of equator with the change of season. In the summer season, the sun shines vertically over the Tropic of Cancer and the ITCZ shifts northwards. The southeast trade winds of the southern hemisphere cross the equator and start blowing in southwest to northeast direction under the Coriolis force. These displaced trade winds are called south-west monsoons when they blow over the Indian sub-continent. The front where the south-west monsoons meet the north-east trade winds is known as the Monsoon Front (ITCZ). Rainfall occurs along this front. In

the month of July the ITCZ shifts to 20°-25° N latitude and is located in the Indo-Gangetic Plain and the south-west monsoons blow from the Arabian Sea and the Bay of Bengal. The ITCZ in this position is called the Monsoon Trough.



69. A

It is an international convention to verify the quantum of annual and seasonal monsoon rainfall once in a decade. Accordingly, in April 2022, in its first-stage long range forecast for the 2022 southwest monsoon, the IMD has downgraded the Long Period Average (LPA) for all-India monsoon rainfall. In other words, what is considered as the country's normal monsoon rainfall has been decreased from 88.06 cm to 87 cm. This newly introduced normal monsoon rainfall figure of 87 cm is based on the 1971-2020 data and has replaced the earlier normal monsoon rainfall figure of 88.06 based on the 1961-2010 data.

Even the new all-India annual rainfall has also decreased by 16.18 mm from 1176.9 mm (based on 1961-2010) to 1160.1mm (based on 1971-2020). Normal rainfall over the North-eastern region (Arunachal Pradesh, Nagaland, Manipur, Mizoram and

70.

Tripura) recorded during 1971-2020 was less than during 1961-2010, while the western-central India (Kutch-Saurashtra, Rajasthan and parts of west Madhya Pradesh) had more rainfall during 1971-2020 than during 1961-2010.

D

Fog is nothing but a cloud at or near the ground making visibility poorer. It occurs when the temperature of an air mass with high moisture falls all of a sudden and condensation takes place within itself on fine dust particles. Generally associated with temperature inversion, fog occurs in the morning and disperse with sun rise because water droplets are evaporated with rise in temperature. Fog is most common in the winter morning in the subtropical region and disperse with sun rise but it occurs in all seasons in the regions beyond 35° latitude.

Radiation fog is formed when warm and moist air overlies cold ground surface. The conditions favorable to its occurrence are log and cold winter nights, cloudless sky, sufficient moisture in the air, very weak winds and ground inversion of temperature. Radiation fog (or ground fog) episodes last for a few mornings and are localized in nature.

In contrast, "advection fog" is larger in scale both in terms of the area covered and duration. It forms when warm, moist air passes over a cool surface, causing water vapor to condense. It mostly occurs where warm, tropical air meets cooler ocean water. If the wind blows in the right direction, sea fog can be transported over coastal land areas.

In India, radiation and advection fog are most common mostly over north India in winters. While advection fog forms in the coastal areas, radiation fog forms on a humid night with clear sky mostly after the passage of a Western Disturbance, a storm that originates in the Mediterranean region. In north-western India, such conditions allow fog to persist for many days making visibility poorer. With Delhi getting

71.

more polluted, it is recording more fog days than other cities.

B

Any tropical cyclone that develops within the North Indian Ocean is monitored by the India Meteorological Department. They are classified by the IMD into 7 types based on their severity as shown in the following table. However, a low pressure area can not be called a tropical cyclone.

Table 1.1. Criteria for classification of cyclonic disturbances over the North Indian Ocean

Ocean	
Type of disturbance	Associated maximum sustained wind
1. Low Pressure Area	Not exceeding 17 knots (<31 kmph)
2. Depression	17 to 27 knots (31-49 kmph)
3. Deep Depression	28 to 33 Knots (50-61 kmph)
4. Cyclonic Storm	34 to 47 Knots (62-88 kmph)
5. Severe Cyclonic Storm	48 to 63 Knots (89-117 kmph)
6. Very Severe Cyclonic Storm	64 to 90 Knots (118-167 kmph)
7. Extremely Severe Cyclonic Storm	91 to 119 Knots (168-221 kmph)
8. Super Cyclonic Storm	120 Knots and above (≥222 kmph)

72.

A

The southwest monsoon derives its name from winds which blow from a south-westerly direction in the Indian subcontinent. These winds come from a powerhouse located more than 4,000 kilometres from India. This powerhouse is known as the Mascarene High. This high-pressure region is located between 25°S-35°S and 40°E-90°E near the Mascarene Islands in the southern Indian Ocean.

Normally, this high-pressure region starts forming by mid-April and its strength is an important factor which determines the intensity of monsoon in India. A stronger high pressure will produce stronger winds or monsoon current. If there is a delay in the formation of Mascarene High, there is also the possibility of a delay in the onset of monsoon in India. Mascarene High has been a subject of research for many years. Most research says that its strength is determined by the happenings in the Antarctic region.

73.

C

Variability of rainfall refers to variations in rainfall from the average amount. The

variability of rainfall is computed with the help of the following formula:

$C.V. = (\text{Standard Deviation} / \text{Mean}) \times 100$;
where C.V. is the co-efficient of variation.

The rainfall in India is highly variable. The actual rainfall of a place in a year deviates from its average rainfall by 10 to over 60 per cent. The highest variability is found in the areas where the average annual rainfall is the lowest such as desert areas of Rajasthan. Here, variability of rainfall is around 60 per cent.

Contrary to this, in the areas where the average annual rainfall is over 200 cm (Meghalaya plateau, Western Ghats), the annual variability of rainfall is less than 10%.

Variability of annual rainfall increases from the western coast to the interior of the Peninsular region and from West Bengal and Odisha towards north and north-west.

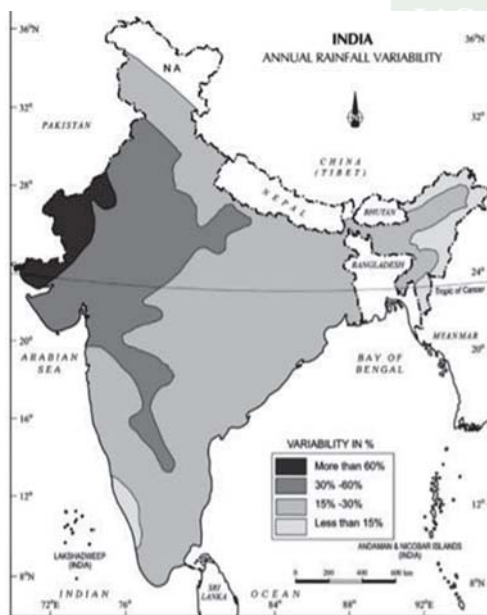


Figure 4.12 : India: Variability of Annual Rainfall

74. **B**

The word El-Nino means 'Child Christ' because this current appears around Christmas in December. La Nina means

Little Girl in Spanish. El Nino is a climate pattern that describes the unusual warming of surface waters in the eastern tropical Pacific Ocean. El Nino is the "warm phase" of a larger phenomenon called the El Nino-Southern Oscillation (ENSO). La Nina, the "cool phase" of ENSO, is a pattern that describes the unusual cooling of the region's surface waters. El Nino and La Nina are considered the ocean part of ENSO, while the Southern Oscillation is its atmospheric changes.

El Nino has an impact on ocean temperatures, the speed and strength of ocean currents, the health of coastal fisheries, and local weather from Australia to South America and beyond. El Nino events occur irregularly at two- to seven-year intervals. However, El Nino is not a regular cycle, or predictable in the sense that ocean tides are. This current increases the temperature of water on the Peruvian coast by 10°C which results in:

- a. the distortion of equatorial atmospheric circulation
- b. irregularities in the evaporation of sea water
- c. reduction in the amount of planktons which further reduces the number of fish in the sea.

75. **B**

A climatic region is that area which possesses a broad uniformity of climatic conditions caused by the combined effects of climatic elements - temperature, pressure, winds, humidity and precipitation. Temperature and rainfall are two important elements which are considered to be decisive in all the schemes of climatic classification. There are different schemes of classification of climate. Koeppen based his scheme of Climatic classification on monthly values of temperature and precipitation.

Monsoon type with dry season in summers (AS) - the region of this type of climate extends along the coromandel coast.



76. C

Ocean currents are the continuous, predictable, directional movement of seawater driven by gravity, wind (Coriolis Effect), and water density. Ocean water moves in two directions: horizontally and vertically.

Oyashio or the Kurile current, is a cold subarctic ocean current that flows south and circulates counter-clockwise in the western North Pacific Ocean. The waters of the Oyashio Current originate in the Arctic Ocean and flow southward via the Bering Sea, passing through the Bering Strait and transporting cold water from the Arctic Sea into the Pacific Ocean and the Sea of Okhotsk. It collides with the Kuroshio Current off the eastern shore of Japan to form the North Pacific Current.

The Kuroshio Current is a north-flowing, warm ocean current on the west side of the North Pacific Ocean basin. It was named for the deep blue appearance of its waters. Similar to the Gulf Stream in the North Atlantic, the Kuroshio is a powerful western boundary current that transports warm equatorial water poleward and forms the western limb of the North Pacific Subtropical Gyre. Off the East Coast of

Japan, it merges with the Oyashio Current to form the North Pacific Current.

The Falkland Current is a cold water current that flows northward along the Atlantic coast of Patagonia as far north as the mouth of the Río de la Plata. This current results from the movement of water from the West Wind Drift as it rounds Cape Horn. It takes its name from the Falkland Islands. This cold current mixes with the tropical Brazil Current in the Argentine Sea, giving it its temperate climate.

The Labrador Current is a cold current in the North Atlantic Ocean which flows from the Arctic Ocean south along the coast of Labrador and passes around Newfoundland, continuing south along the east coast of Canada near Nova Scotia. Near Nova Scotia, this cold water current meets the warm northward moving Gulf Stream. The combination of these two currents produces heavy fogs and has also created one of the richest fishing grounds in the world.

77. C

Kelp forests are underwater areas with a high density of kelp, which covers a large part of the world's coastlines. Smaller areas of anchored kelp are called kelp beds. They are recognized as one of the most productive and dynamic ecosystems on Earth. Although algal kelp forest combined with coral reefs only cover 0.1% of Earth's total surface, they account for 0.9% of global primary productivity. Kelp forests occur worldwide throughout temperate and polar coastal oceans.

Physically formed by brown macroalgae, kelp forests provide a unique habitat for marine organisms and are a source for understanding many ecological processes. Over the last century, they have been the focus of extensive research, particularly in trophic ecology, and continue to provoke important ideas that are relevant beyond this unique ecosystem. For example, kelp forests can influence coastal oceanographic patterns and provide many ecosystem services.

<p>However, the influence of humans has often contributed to kelp forest degradation. Of particular concern are the effects of overfishing nearshore ecosystems, which can release herbivores from their normal population regulation and result in the overgrazing of kelp and other algae. This can rapidly result in transitions to barren landscapes where relatively few species persist. Already due to the combined effects of overfishing and climate change, kelp forests have all but disappeared in many especially vulnerable places, such as Tasmania's east coast and the coast of Northern California. The implementation of marine protected areas is one management strategy useful for addressing such issues, since it may limit the impacts of fishing and buffer the ecosystem from additive effects of other environmental stressors.</p> <p>Kelps are primarily associated with temperate and arctic waters worldwide. Of the more dominant genera, Laminaria is mainly associated with both sides of the Atlantic Ocean and the coasts of China and Japan; Ecklonia is found in Australia, New Zealand, and South Africa; and Macrocystis occurs throughout the northeastern and southeastern Pacific Ocean, Southern Ocean archipelagos, and in patches around Australia, New Zealand, and South Africa. The region with the greatest diversity of kelps (>20 species) is the northeastern Pacific, from north of San Francisco, California, to the Aleutian Islands, Alaska.</p> <p>78. D</p> <p>Bodies of water are made up of layers, determined by temperature. The top surface layer is called the epipelagic zone, and is sometimes referred to as the "ocean skin" or "sunlight zone." This layer interacts with the wind and waves, which mixes the water and distributes the warmth. At the base of this layer is the thermocline. A thermocline is the transition layer between the warmer mixed water at the surface and the cooler deep water below. It is relatively</p>	<p>easy to tell when you have reached the thermocline in a body of water because there is a sudden change in temperature. In the thermocline, the temperature decreases rapidly from the mixed layer temperature to the much colder deep water temperature.</p> <p>In the ocean, the depth and strength of the thermocline vary from season to season and year to year. It is semi-permanent in the tropics, variable in temperate regions (often deepest during the summer), and shallow to non-existent in the polar regions, where the water column is cold from the surface to the bottom.</p> <p>Thermoclines also play a role in meteorological forecasting. For example, hurricane forecasters must consider not just the temperature of the ocean's skin (the sea surface temperature), but also the depth of warm water above the thermocline. Water vapor evaporated from the ocean is a hurricane's primary fuel. The depth of the thermocline is the measure of the size of the "fuel tank" and helps to predict the risk of hurricane formation.</p> <p>79. D</p> <p>The Leeuwin Current is a warm ocean current which flows southwards near the western coast of Australia in the Indian ocean. It rounds Cape Leeuwin to enter the waters south of Australia where its influence extends as far as Tasmania.</p> <p>The existence of the current was first suggested by William Saville-Kent in 1897. Saville-Kent noted the presence of warm tropical water offshore in the Houtman Abrolhos, making the water there in winter much warmer than inshore at the adjacent coast. The existence of the current was confirmed over the years, but not characterised and named until Cresswell and Golding did so in the 1980s.</p> <p>The West Australian Current and Southern Australian Countercurrent, which are produced by the West Wind Drift on the southern Indian Ocean and at Tasmania, respectively, flow in the opposite direction,</p>
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<p>80. B</p>	<p>producing one of the most interesting oceanic current systems in the world.</p> <p>In marine geology, a guyot, also known as a tablemount, is an isolated underwater volcanic mountain (seamount) with a flat top. The diameters of these flat summits can exceed 10 km. Guyots are most commonly found in the Pacific Ocean, but they have been identified in all the oceans except the Arctic Ocean. A guyot is an elevated landform rising from the bottom of the ocean and has a flat top at least 660 feet in diameter. A guyot must rise at least 3,000 feet above the seafloor. The sides of a guyot usually have a very moderate incline of about 20 degrees.</p> <p>Volcanic activity forms a guyot under the ocean. Vents in the seafloor over an area of volcanic activity may produce lava periodically to grow a guyot or other seamount formation. A seamount is any kind of underwater elevated landform.</p>	<p>across continental shelves, and which begin with their upstream ends in alignment with and sometimes within the mouths of large rivers, such as the Congo River and the Hudson Canyon. About 28.5% of submarine canyons cut back into the edge of the continental shelf, whereas the majority (about 68.5%) of submarine canyons have not managed at all to cut significantly across their continental shelves, having their upstream beginnings or "heads" on the continental slope, below the edge of continental shelves.</p> <p>The formation of submarine canyons is believed to occur as the result of at least two main process: 1) erosion by turbidity current erosion; and 2) slumping and mass wasting of the continental slope. While at first glance the erosion patterns of submarine canyons may appear to mimic those of river-canyons on land, several markedly different processes have been found to take place at the soil/water interface.</p> <p>Many canyons have been found at depths greater than 2 km below sea level. Some may extend seawards across continental shelves for hundreds of kilometres before reaching the abyssal plain.</p> <p>Examples of Indian Ocean submarine canyons -</p> <p>Ganges Canyon, extending from the Ganges off the coast of India, Indus Canyon, extending from the Indus River off the coast of Pakistan and Perth Canyon, extending from the Swan River off the coast of Fremantle, Western Australia.</p>
<p>81. C</p>	<p>A submarine canyon is a steep-sided valley cut into the seabed of the continental slope, sometimes extending well onto the continental shelf, having nearly vertical walls, and occasionally having canyon wall heights of up to 5 km, from canyon floor to canyon rim, as with the Great Bahama Canyon. Just as above-sea-level canyons serve as channels for the flow of water across land, submarine canyons serve as channels for the flow of turbidity currents across the seafloor. Turbidity currents are flows of dense, sediment laden waters that are supplied by rivers, or generated on the seabed by storms, submarine landslides, earthquakes, and other soil disturbances. Turbidity currents travel down slope at great speed (as much as 70 km/h), eroding the continental slope and finally depositing sediment onto the abyssal plain, where the particles settle out.</p> <p>About 3% of submarine canyons include shelf valleys that have cut transversely</p>	<p>82. C</p> <p>Corals are made up of genetically identical organisms called polyps. These polyps have microscopic algae called zooxanthellae living within their tissues. The coral provides the zooxanthellae with the compounds necessary for photosynthesis. In return, the zooxanthellae supply the coral with organic products of</p>

<p>photosynthesis, like carbohydrates, which are utilized by the coral polyps for synthesis of their calcium carbonate skeletons. In addition to providing corals with essential nutrients, zooxanthellae are responsible for the unique and beautiful colors of corals.</p> <p>When corals face stress by changes in conditions such as temperature, light, or nutrients, they expel the symbiotic algae zooxanthellae living in their tissues, causing them to turn completely white. This phenomenon is called coral bleaching.</p> <p>The pale white colour is of the translucent tissues of calcium carbonate which are visible due to the loss of pigment producing zooxanthellae. Corals can recover if the stress-caused bleaching is not severe.</p> <p>Causes of coral bleaching-</p> <ol style="list-style-type: none"> 1. Most coral species live in waters close to the warmest temperature they can tolerate i.e., a slight increase in ocean temperature can harm corals. El Nino elevates the sea temperature and destroys coral reefs. 2. Due to rise in carbon dioxide levels, oceans absorb more carbon dioxide. This increases the acidity of ocean water and inhibits the corals ability to create calcareous skeletons, which is essential for their survival. 3. Changes in tropical weather patterns result in less cloud cover and more radiations which induce coral bleaching. 4. Penetration of bacterium like vibrio shiloi inhibits photosynthesis of zooxanthellae. These bacteria become more potent with elevated sea temperatures. 5. Over-fishing, pollution from agricultural and industrial runoff, coral mining, development of industrial areas near coral ecosystems also adversely impact corals. 	<p>83. C</p> <p>Oceanic trenches (Submarine Trenches) are prominent long, narrow topographic depressions of the ocean floor. They are typically 50 to 100 kilometers wide and 3 to 4 km below the level of the surrounding oceanic floor, but can be thousands of kilometers in length. There are about 50,000 kilometers of oceanic trenches worldwide, mostly around the Pacific Ocean, but also in the eastern Indian Ocean and a few other locations. The greatest ocean depth measured is in the Challenger Deep of the Mariana Trench, at a depth of 11,034 m below sea level.</p> <p>Submarine trenches are a feature of the Earth's distinctive plate tectonics. They mark the locations of convergent plate boundaries, along which lithospheric plates move towards each other at rates that vary from a few millimeters to over ten centimeters per year.</p> <p>Submarine Trenches are not always located in the middle of the ocean basins. They may be very close or parallel to the continents bordered by Fold Mountains. They are usually found adjacent to the areas of volcanic and earthquake activity. Great earthquakes and tsunamis are born in them. The Pacific Ocean has the largest number of trenches.</p> <p>84. C</p> <p>Ocean Thermal Energy Conversion (OTEC) uses the ocean thermal gradient between cooler deep and warmer shallow or surface seawaters to run a heat engine and produce useful work, usually in the form of electricity. OTEC can operate with a very high capacity factor and so can operate in base load mode.</p> <p>The denser cold water masses, formed by ocean surface water interaction with cold atmosphere in quite specific areas of the North Atlantic and the Southern Ocean, sink into the deep sea basins and spread in entire deep ocean by the thermohaline circulation. Upwelling of cold water from the deep ocean is replenished by the downwelling of cold surface sea water.</p>
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<p>85. C</p>	<p>Among ocean energy sources, OTEC is one of the continuously available renewable energy resources that could contribute to base-load power supply. The resource potential for OTEC is considered to be much larger than for other ocean energy forms. Up to 88,000 TWh/yr of power could be generated from OTEC without affecting the ocean's thermal structure.</p> <p>OTEC can also supply quantities of cold water as a by-product. This can be used for air conditioning and refrigeration and the nutrient-rich deep ocean water can feed biological technologies. Another by-product is fresh water distilled from the sea.</p> <p>A continental shelf is a portion of a continent that is submerged under an area of relatively shallow water known as a shelf sea. Much of these shelves were exposed by drops in sea level during glacial periods. The shelf surrounding an island is known as an insular shelf.</p> <p>The continental margin, between the continental shelf and the abyssal plain, comprises a steep continental slope, surrounded by the flatter continental rise, in which sediment from the continent above cascades down the slope and accumulates as a pile of sediment at the base of the slope. Extending as far as 500 km from the slope, it consists of thick sediments deposited by turbidity currents from the shelf and slope. The continental rise's gradient is intermediate between the gradients of the slope and the shelf.</p> <p>Continental shelves cover an area of about 27 million km², equal to about 7% of the surface area of the oceans. The width of the continental shelf varies considerably - it is not uncommon for an area to have virtually no shelf at all, particularly where the forward edge of an advancing oceanic plate dives beneath continental crust in an offshore subduction zone such as off the coast of Chile or the west coast of Sumatra. The largest shelf - the Siberian Shelf in the Arctic Ocean - stretches to 1,500 kilometers in width.</p>	<p>They are much narrower or absent in some continents, particularly where fold mountains run parallel or close to the coast as along the eastern Pacific Ocean (Chilean coast). For the same reason due to presence of Western Ghats, the continental shelf off the eastern coast of India is much wider than that of the western coast.</p> <p>86. D</p> <p>There are unconsolidated sediments, deposited on the ocean floor. These are ocean deposits. They vary from location to location. The study of ocean deposits is important in understanding the rocks exposed on the earth's surface which were once laid under sea.</p> <p>1. Terrigenous deposits</p> <p>Terrigenous deposits are derived from the wear and tear of land and volcanic and organic products. The greater part of the deposits on the continental shelf and slopes is derived from rock material let loose by disintegration and decomposition by the agents of weathering and carried to sea by the agents of erosion, such as running water, wind, etc. The process and extent of disintegration depends on the nature of rock material, climate and time taken. The larger particles of the terrigenous deposits are found near the shore and the finer ones carried deeper. The extent to which they are carried outwards depends on the size of rock material and the strength of sea waves and currents. Sand, slit, clay and muds are example of terrigenous deposits.</p> <p>2. Volcanic deposits</p> <p>In volcanic regions the deposits of continental shelf and slope consist chiefly of products of volcanism, which are subject to chemical and mechanical weathering and are carried to the ocean by actions of running water and wind. The volcanic deposits differ from the ordinary terrigenous deposits in one respect-they are made of pyroclastic volcanic products and lava, rather than quartz.</p> <p>3. Pelagic Deposits</p> <p>Pelagic deposits are the most conspicuous of all deposits-covering about 75% of the</p>
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<p>total sea floor. This is because, except for fine volcanic ash, little terrigenous material is carried into the deeps. The pelagic deposits consist of both organic and inorganic material.</p> <p>Organic Material</p> <p>This is in the form of a kind of liquid mud, called ooze, which contains shells and skeletons of various marine organisms. The ooze is said to be calcareous when the shell is made of calcium carbonate. The calcareous ooze may be either pteropod ooze or globigerina ooze. Most parts of the Indian and Atlantic Oceans have calcareous ooze as deposits. When the shell is made of silica, the ooze is said to be siliceous ooze, which can be either the diatom type or the radiolarian type of ooze. The southern fringes of the Indian and the Atlantic Oceans have the siliceous type of ooze.</p> <p>Inorganic Material</p> <p>This is in the form of red clay, which is apparently of a volcanic origin. The chief constituents of red clay are silicon and aluminium dioxide, while other constituents include iron, manganese, phosphorus and radium. The red clay is the most widely spread pelagic deposit and covers 38% of the sea floor. The red clay covers more than half of the Pacific floor.</p> <p>87. D</p> <p>Most coral reefs occur in shallow water near shore. As a result, they are particularly vulnerable to the effects of human activities, both through direct exploitation of reef resources, and through indirect impacts from adjacent human activities on land and in the coastal zone. Many of the human activities that degrade coral reefs are inextricably woven into the social, cultural, and economic fabric of regional coastal communities.</p> <p>Coral reefs face many threats from local sources, including:</p> <p>a. Physical damage or destruction from coastal development, dredging, quarrying, destructive fishing practices and gear, boat anchors and groundings,</p>	<p>and recreational misuse (touching or removing corals).</p> <p>b. Pollution that originates on land but finds its way into coastal waters. There are many types and sources of pollution from land-based activities, for example:</p> <ol style="list-style-type: none"> 1. Sedimentation from coastal development, urban stormwater runoff, forestry, and agriculture. 2. Nutrients (nitrogen and phosphorous) from agricultural and residential fertilizer use, sewage discharges (including wastewater treatment plants and septic systems), and animal waste. 3. Pathogens from inadequately treated sewage, stormwater, and runoff from livestock pens. 4. Toxic substances, including metals, organic chemicals and pesticides found in industrial discharges, sunscreens, urban and agricultural runoff, mining activities, and runoff from landfills. 5. Trash and micro-plastics from improper disposal and stormwater runoff. <p>c. Overfishing can alter food-web structure and cause cascading effects, such as reducing the numbers of grazing fish that keep corals clean of algal overgrowth. Blast fishing (i.e., using explosives to kill fish) can cause physical damage to corals as well.</p> <p>d. Coral harvesting for the aquarium trade, jewellery, and curios can lead to over-harvesting of specific species, destruction of reef habitat, and reduced biodiversity.</p> <p>88. D</p> <p>Territorial sea, as defined by the 1982 United Nations Convention on the Law of the Sea, is a belt of coastal waters extending at most 12 nautical miles (22 km) from the baseline (usually the mean low-water mark) of a coastal state. The territorial sea is regarded as the sovereign territory of the state, although foreign ships (military and civilian) are allowed innocent passage through it, or transit passage for straits; this</p>
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<p>sovereignty also extends to the airspace over and seabed below. Adjustment of these boundaries is called, in international law, maritime delimitation.</p> <p>A state's territorial sea extends up to 12 nmi (22 km) from its baseline. If this would overlap with another state's territorial sea, the border is taken as the median point between the states' baselines, unless the states in question agree otherwise. A state can also choose to claim a smaller territorial sea.</p> <p>89. B</p> <p>The Great Barrier Reef is the world's largest coral reef system composed of over 2,900 individual reefs and 900 islands stretching for over 2,300 kilometres over an area of approximately 3,44,400 square kilometres. The reef is located in the Coral Sea, off the coast of Queensland, Australia, separated from the coast by a channel 100 miles wide in places and over 200 feet deep. The Great Barrier Reef can be seen from outer space and is the world's biggest single structure made by living organisms. This reef structure is composed of and built by billions of tiny organisms, known as coral polyps. It supports a wide diversity of life and was selected as a World Heritage Site in 1981. CNN labelled it one of the seven natural wonders of the world in 1997. Australian World Heritage places included it in its list in 2007. The Queensland National Trust named it a state icon of Queensland in 2006.</p> <p>A large part of the reef is protected by the Great Barrier Reef Marine Park, which helps to limit the impact of human use, such as fishing and tourism. Other environmental pressures on the reef and its ecosystem include runoff, climate change accompanied by mass coral bleaching, dumping of dredging sludge and cyclic population outbreaks of the crown-of-thorns starfish. According to a study published in October 2012 by the Proceedings of the National Academy of Sciences, the reef has lost more than half its coral cover since 1985, a finding</p>	<p>reaffirmed by a 2020 study which found over half of the reef's coral cover to have been lost between 1995 and 2017, with the effects of a widespread 2020 bleaching event not yet quantified.</p> <p>90. D</p> <p>Causes of formation of Ocean Currents -</p> <p>Planetary winds are one of the most important causes of ocean currents. The planetary winds blow continuously in a particular direction and drag the surface water due to the force of friction. This leads to the formation of ocean currents. Most of the ocean currents of the world follow the direction of prevailing or planetary winds. For example, The North Atlantic Drift in the Atlantic ocean.</p> <p>There are marked variations in the horizontal and vertical distribution of the temperatures in the ocean. The temperatures are higher at the equator than at the poles. Thus, in the equatorial region, the density of water decreases due to high temperatures and more rainfalls. As a result of this, the lighter water from the equatorial region moves towards the colder and denser water of the polar areas.</p> <p>The amount of salts contained in seawater does vary from one part of the ocean to another. The high salinity water tends to subside and move below the water of low salinity. Ocean currents on the water surface are generated from the areas of low salinity to the areas of high salinity.</p> <p>The earth rotates on its axis from west to east. This rotation is the cause of deflective force known as Coriolis force which deflects the general direction of the winds and that of the ocean currents. For example, the currents flowing from the Equator towards the North and South Poles are deflected to their right in the Northern Hemisphere and towards their left in the Southern Hemisphere. The counter-equatorial currents are also the result of the rotation of the earth.</p>
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<p>The shape and configuration of the coastlines also have a close influence on the direction and movement of the ocean currents. For example, the equatorial current after being obstructed by the Brazilian coast is bifurcated into two branches. The Northern Branch is called the Caribbean current while the Southern branch is called the Brazilian current.</p> <p>91. D</p> <p>The Indian subcontinent is one of the worst affected regions in the world. The subcontinent with a long coastline of 8041 kilometres is exposed to nearly 10 per cent of the world's tropical cyclones. Of these, the majority of them have their initial genesis over the Bay of Bengal and strike the East coast of India. On an average, five to six tropical cyclones form every year, of which two or three could be severe. More cyclones occur in the Bay of Bengal than the Arabian Sea and the ratio is approximately 4:1. Cyclones occur frequently on both the coasts (the West coast - Arabian Sea; and the East coast - Bay of Bengal). An analysis of the frequency of cyclones on the East and West coasts of India between 1891 and 1990 shows that nearly 262 cyclones occurred (92 of these severe) in a 50 km wide strip above the East coast. Less severe cyclonic activity has been noticed on the West coast, where 33 cyclones occurred the same period, out of which 19 of were severe.</p> <p>Tropical cyclones occur in the months of May-June and October-November. Cyclones of severe intensity and frequency in the North Indian Ocean are bi-modal in character, with their primary peak in November and secondary peak in May. The disaster potential is particularly high during landfall in the North Indian Ocean (Bay of Bengal and the Arabian Sea) due to the accompanying destructive wind, storm surges and torrential rainfall. Of these, storm surges cause the most damage as sea water inundates low lying areas of coastal regions and causes heavy floods,</p>	<p>erodes beaches and embankments, destroys vegetation and reduces soil fertility.</p> <p>Any tropical cyclone that develops within the North Indian Ocean is monitored by the India Meteorological Department (IMD). As per the IMD's classification of cyclones shown in the table, super cyclonic storm is the most destructive type of cyclone in North Indian Ocean.</p> <p>92. A</p> <p>When an earthquake occurs, it makes seismic waves, which are essentially just the jiggling of the ground. There are three major kinds of seismic waves: P, S, and surface waves. P and S waves together are called 'body waves' because they can travel through the body of the earth, and are not trapped near the surface. Both P and S waves are called body waves because they move within the Earth's interior. The interaction of the body waves with earth's surface produces surface waves which move close to or on the outside surface of the ground. Unlike P and S wave, they are trapped near the earth surface. Though slower than P and S waves, they play the most destructive role in shaking the ground because their larger amplitude, compared to that of P and S waves, diminishes less rapidly with distance. Surface waves are categorised into two types: i) Love waves, that move like S waves but only horizontally; ii) Rayleigh waves, that move both horizontally and vertically in the direction of wave propagation.</p> <p>93. B</p> <p>A tsunami is a series of waves in a water body caused by the displacement of a large volume of water, generally in an ocean or a large lake. Earthquakes, volcanic eruptions and other underwater explosions (including detonations, landslides, glacier calvings, meteorite impacts and other disturbances) above or below water all have the potential to generate a tsunami. Unlike normal ocean waves, which are generated by wind,</p>
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<p>94. C</p>	<p>or tides, which are generated by the gravitational pull of the Moon and the Sun, a tsunami is generated by the displacement of water from a large event.</p> <p>Tsunamis do slow down as they approach land because the water is shallower there. As they slow down, conservation of energy requires that the amplitudes of the waves grow larger.</p> <p>About 80% of tsunamis occur in the Pacific Ocean, but they are possible wherever there are large bodies of water, including lakes. They frequently occur in the Pacific, where dense oceanic plates slide under the lighter continental plates. When these plates fracture, they provide a vertical movement of the seafloor that allows a quick and efficient transfer of energy from the solid earth to the ocean.</p> <p>Main reasons for recurring droughts in India are as below:</p> <ol style="list-style-type: none"> 1. Annual, seasonal, regional variations in rainfall levels. 2. Less than 100 days during the South-West Monsoon season contributing about 73% of the total annual rainfall. 3. Uneven distribution of rainfall over the geography of India. 4. Average annual rainfall of 750 mm over 33% of the total cropped area. 5. Frequently occurring El NINO events associated with climate change. 6. Over-exploitation of groundwater, low conservation and storage capacity of surface water. 7. Faulty cropping systems like excessive wastage of water like the flooding of fields during rice sowing. 8. Growing crops that do not suit the agro-climatology like sugarcane in Maharashtra and rice in southern Karnataka and northern Tamil Nadu. 9. Increasing urbanization and extravagant use of water by urban centres. 	<p>95. B</p> <p>10. Indiscriminate cutting of forest for developmental purposes.</p> <p>The term 'Drought' in simple words is the absence of water for a long period of time, at a place where it is considered abnormal as compared to its usual conditions.</p> <p>Meteorological Drought is a situation where there is a reduction in rainfall for a specific period below a specific amount i.e. the actual rainfall in an area is significantly less than the climatological mean of that area. According to Indian Meteorological Department (IMD), a drought exists when the average annual rainfall is less than 75% of the normal.</p> <p>Hydrological drought is when the water reserves available in sources such as aquifers, lakes and reservoirs fall below a locally significant threshold. Hydrological drought tends to show up more slowly because it involves stored water that is used but not replenished.</p> <p>Agricultural Drought occurs when soil moisture goes below the level needed to sustain plant growth. It is also called as Soil Moisture Drought. The erratic rainfall conditions and inadequate soil moisture result in crop failures.</p> <p>Socioeconomic Drought considers the impact of drought conditions (meteorological, agricultural, or hydrological drought) on supply and demand of some economic goods such as fruits, vegetables, grains and meat. Socioeconomic drought occurs when the demand for an economic good exceeds supply as a result of a weather-related deficit in water supply.</p> <p>96. B</p> <p>At the centre of a mature tropical cyclone is an eye, a roughly cylindrical area (30-65 km in diameter) of light and sinking winds with lowest surface pressure and warmest temperatures. The eye is formed and maintained by the surrounding "eye wall" where warm moist air with highest speed</p>
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<p>undergoes deep convection -- the thermally driven turbulent mixing that moves air parcels from the lower to the upper troposphere thus forming cumulonimbus clouds which produce heaviest rain or thunderstorms.</p> <p>The eye can grow or shrink in size, and when double (concentric) eyewalls form, the inner one may get replaced by the outer one. Such eyewall replacement may occur multiple times thereby allowing the cyclone to grow larger. Outside the eyewall, convection takes place in long, narrow bands that spiral towards the eyewall. The spiral bands or rainbands produce heavy rain and wind (and occasionally tornadoes) but there are, sometimes, rainless gaps between the bands. In fact, from the outer edge of the cyclone till reaching the eye, one would see a progression from light rain to no rain back to slightly more rain many times with each period of rainfall being more intense and longer.</p> <p>97. B</p> <p>Flood plain zoning means dividing the entire flood area into different zones of different risk levels so that land use in each zone is minimised depending on the zone's risk level.</p> <p>According to the Sendai Framework Terminology On Disaster Risk Reduction, structural measures involve any physical construction to minimise possible impacts of hazards and include dams, flood levies, ocean wave barriers, earthquake-resistant construction and evacuation shelters. Non-structural measures are measures not involving physical construction and include building codes, land-use planning laws and their enforcement, research and assessment, information resources and public awareness programmes.</p> <p>Flood Plain Zoning has been recognized as an effective non-structural measure for flood management. It is aimed at demarcating areas likely to be affected by floods of varying magnitude or frequencies levels and specifying the types of</p>	<p>permissible developments in these zones, so that whenever floods actually occur, the damage can be minimised.</p> <p>98. D</p> <p>Marine heatwaves are periods of extremely high temperatures in the ocean (above the 90th percentile of sea surface temperatures). Though recent studies have reported their occurrence and impacts in the global oceans, they are least understood in the tropical Indian Ocean.</p> <p>According to a study led by Roxy Mathew Koll of the Indian Institute of Tropical Meteorology (IITM), Pune, and published in February 2022, the marine heatwaves are increasing in the Indian Ocean thereby affecting the Indian monsoon rainfall. They reduce the rainfall over the central Indian subcontinent while enhancing it over the southern peninsula. The marine heatwaves in the western Indian Ocean and the Bay of Bengal are found to result in drying conditions over the central Indian subcontinent. At the same time, there is a significant increase in the rainfall over south peninsular India in response to the heatwaves in the north Bay of Bengal. These changes are in response to the modulation of the monsoon winds by the heatwaves. This is the first time that a study has demonstrated a close link between marine heatwaves and atmospheric circulation and rainfall.</p> <p>The marine heatwaves also cause habitat destruction due to coral bleaching, seagrass destruction, and loss of kelp forests, affecting the fisheries sector adversely. An underwater survey showed that 85% of the corals in Gulf of Mannar near the Tamil Nadu coast got bleached after the marine heatwave in May 2020.</p> <p>99. C</p> <p>Of the 1,350 potentially active volcanoes in the world, only one lies in India. The Barren Island volcano, which sits on a 106-million-year-old oceanic crust, is believed to erupted for the first time 1.6 million years ago, as indicated by its subaerial lava flows. The oldest recorded eruption, however, ranges from 1787 to 1832.</p>
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<p>100. C</p>	<p>Historically, the first record of the volcano's eruption dates back to 1787. It was known to have erupted at least five times over the next 100 years. Then there was silence for a century. In 1991, it spewed so massively that smoke billowed out for about six months. Ever since, there have been eruptions every two-three years. All of these recorded eruptions lie on the lowest end of the United States Geological Survey's Volcanic Explosivity Index that ranks volcanoes from 1-8 based on the quantity of volcanic material spewed and the strength with which it does so.</p> <p>Located in the Andaman Sea, Narcondom is a dormant volcanic island that last erupted 5,60,000 years ago. Formed of andesite, the volcano's peak rises 710 above sea level.</p> <p>Bay of Bengal has seen nearly five times the number of tropical cyclones than Arabian Sea in the post-monsoon period (September to December), revealed a long-term analysis of cyclones that struck the coasts of India between 1891 and 2018.</p> <p>Higher frequency of cyclones in the Bay can be attributed to frequent low pressures created by warm water of the ocean.</p> <p>The Bay of Bengal is shaped like a trough that makes it more conducive for storms to gain force. Moreover, the high sea surface temperature makes matters worse, triggering more intense storms.</p> <p>The Bay gets more rainfall with sluggish winds and warm air currents around it that keep temperatures relatively high all year. The constant inflow of fresh warm water from perennial rivers like Brahmaputra and the Ganges makes it further impossible to mix with the cooler water below. Lack of landmass between the Pacific Ocean and the Bay cause cyclonic winds to move into the coastal areas causing heavy rainfall. The absence of air movements from north-western India towards the Bay in the post-monsoon phase is also another reason for the chances of cyclones in the Bay of Bengal.</p>	<p>101. C</p> <p>In contrast, the Arabian sea witnesses fewer tropical cyclones, because its surface water is less hot due to the monsoon winds and is more saline thereby reducing evaporation rate.</p> <p>Located in Tanzania, Mount Kilimanjaro is Africa's tallest mountain and is the world's largest free-standing mountain, meaning it is not part of a mountain range. It is a stratovolcano or composite volcano (a very large volcano made of layers of ash, lava, and rock) and is made up of three cones: Kibo, Mawenzi, and Shira. Kibo is the summit of the mountain and the tallest of the three volcanic formations. While Mawenzi and Shira are extinct, Kibo is dormant and could possibly erupt again.</p> <p>Mauna Loa is one of five volcanoes that form the Island of Hawaii and erupts quietly. Mount St. Helens is an explosive type of dacite volcano in the Cascade Range, southwestern Washington, U.S. Its eruption on May 18, 1980, was one of the greatest volcanic explosions ever recorded in North America.</p> <p>Krakatoa volcano on Rakata Island in the Sunda Strait between Java and Sumatra, Indonesia is an example of most violent, explosive (Peleean) type of eruption. Its explosive eruption in 1883 was one of the most catastrophic in history.</p> <p>102. B</p> <p>According to the National Disaster Management Act, 2005, there shall be a National Disaster Management Authority comprising the PM as the Chairperson and such number of other members, not exceeding nine, as may be prescribed by the Central Government. Under Section 6 of the Act, the NDMA shall be responsible for laying down the policies, plans and guidelines for disaster management for ensuring timely response to disasters. The NDMA may also lay down the broad policies and guidelines for the functioning of the National Institute of Disaster Management. The Chairperson of the NDMA can, in the case of emergency, exercise all or any of</p>
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<p>the powers of the NDMA but exercise of such powers shall be subject to ex post facto ratification by the NDMA.</p> <p>103. B</p> <p>Under Section 2 of the disaster Management Act, 2005, a disaster is a catastrophe, mishap or grave occurrence in any area arising from natural or man-made causes, which results in substantial loss of life or human suffering or damage to property or degradation of environment and which is of such magnitude as it is beyond the coping capacity of the community in the affected area.</p> <p>104. A</p> <p>A landslide is an uncontrollable downhill flow of rock, earth, debris; and is caused by heavy rainfall, earthquake etc. Landslides usually occur due to hydro-geological factors such as earthquakes, volcanic eruption and heavy rainfall and floods. But human activities on hill slopes such as deforestation, mining and quarrying, construction of transport lines, houses, dams, etc., make the hill slopes more vulnerable to landslides during the times of heavy rainfall and flood, as witnessed, for example, in the 2013 Kedarnath tragedy</p> <p>About 12.6% of India's landmass, excluding snow-covered areas is prone to landslides. The North-Western Himalayas, the Sub-Himalayan terrain of the North-East, the Western and Eastern Ghats are prone to landslides covering 22 States and 2 Union Territories.</p> <p>Based on the data of 4,800 fatal landslides which occurred from 2004 to 2016, leaving out those caused by earthquakes, a study of UK's Sheffield University (published in 2018) shows, "landslides triggered by human activities such as construction works, illegal mining and unregulated hill-cutting are on the rise around the world and India is among the most-affected countries, accounting for at least 28% of such events over last 12 years. All countries in the top 10 for the human-induced fatal landslides are located in Asia. India accounts for 20% of these incidents.</p>	<p>Landslide occurrence peaks during the northern hemisphere summer, when tropical cyclones are more frequent and the monsoon brings heavy rain to south Asia. Fatal landslides are more common in settlements, along roads and at sites rich in precious resources. In the Himalayan region, many of them occurred on road building sites in rural areas. Hill-cutting occurs in rural areas, where people collect material from hill-slopes to build homes."</p> <p>105. C</p> <p>106. C</p> <p>Thunderstorm is an intense local storm associated with large, dense cumulonimbus clouds in which there is intense convection of warm and moist air. When, in the process of convection, condensation occurs below freezing point, hails (ice particles ranging from the size of a pea to large ball) are formed. When the rising convective currents become weak and feeble, the hails come down on the ground and the phenomenon is called 'hailstorm'.</p> <p>A cloudburst is a sudden, very heavy rainfall (mostly 100 mm per hour), usually local in nature and of brief duration. Because of heavy downpour associated with thunderstorms, they are also called 'cloud bursts' but the rainfall in a thunderstorm is of vary shorter duration. Also, a cloudburst may occur even without hails or thunders.</p> <p>107. C</p> <p>According to a written reply by the Minister of State for Home Affairs to a question in the Rajya Sabha in July 2023, major initiatives undertaken by NDMA during the last 2 years are:</p> <ol style="list-style-type: none"> 1. NDMA has issued new Guidelines on cross-cutting issues, namely:- <ul style="list-style-type: none"> • Preparation of Action Plan - Prevention and Management of Thunderstorm & Lightning, Squall, Dust, Hailstorm and Strong Winds. • Preparation of Action Plan - Prevention and Management of Cold Wave and Frost.
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<p>2. NDMA also implemented the following schemes:</p> <ul style="list-style-type: none"> • Upscaling of AapdaMitra - to train 1,00,000 volunteers in 350 districts highly prone to landslides, cyclones, earthquake and floods. • Common Alerting Protocol - An integrated alert system for dissemination of Geo Targeted alerts to the public through multiple media on impending disasters. • Extension of Emergency Response Support System for disaster emergencies - a Pan-India single number (112) based emergency response system for helping citizens in emergencies. • Mock Exercises -Conducted State and Multi-State level Mock Exercises on various hazards like floods, landslides and Chemical disasters etc. to improve the preparedness of States and districts. • National Cyclone Risk Mitigation Project (NCRMP) Phase-II in 06 Coastal States (Goa, Gujarat, Karnataka, Kerala, Maharashtra & West Bengal). <p>3. NDMA has conducted pre-monsoon meetings, briefing/debriefing sessions and issued instructions/advisories to all stakeholders</p> <p>4. NDMA has constituted a Multi-disciplinary Group of experts for comprehensive assessment of ground subsidence and related issues at Joshimath, Uttarakhand.</p> <p>5. NDMA runs awareness generation campaign on various disasters through television, Radio & social media.</p> <p>6. During India's G-20 Presidency, NDMA steered the constitution of a G20 Working Group on Disaster Risk Reduction (DRR).</p> <p>7. NDMA has developed a Web Based Dynamic Composite Risk Atlas & Decision Support System (Web DCRA& DSS) tool for Cyclone impacts forecasting covering all the 13 Coastal States and Union Territories.</p>	<p>108. B</p> <p>A Manual for Drought Management, a guide for governments and agencies in India engaged in the prevention, mitigation and management of drought, was developed by the National Institute of Disaster Management (NIDM) with support and guidance from the Department of Agriculture and Cooperation, Ministry of Agriculture. It was first published by the DAC & FW in 2009, which has been revised and updated in 2016 and 2020.</p> <p>The MoAFW's Manual for Drought Management (updated in 2016) obligates states to follow a three-step approach, based on which an area can be declared drought-hit and assigned a 'severe', 'moderate' or 'normal' category. The first step (Trigger-1) is to look at Two Mandatory Indicators - rainfall deviation and dry spell. If the Trigger-1 is set off, the next step (Trigger-2) is to look at Four Types Of Impact Indicators - agriculture (crop area sown), remote sensing-based vegetation indices, soil moisture, and hydrology. The States may consider any three of the four types of the Impact Indicators (one from each) to assess drought conditions and their intensity and make a judgement. If all three chosen indicators are in the 'severe' category, it amounts to severe drought; and if two of the three chosen impact indicators are in the 'moderate' class, it amounts to moderate drought. In the event of a finding of "severe" or "moderate" drought, trigger 2 will be set off and in the third step, the states can conduct a sample survey for field verification or ground truthing to make a final determination of the intensity of drought as 'severe' or 'moderate'. Once a drought is determined, the state government needs to issue a notification specifying the geographical extent. The notification is valid for six months, unless de-notified earlier.</p> <p>109. C</p> <p>Quantitatively, a heat wave need not be considered till the maximum temperature of an IMD station reaches at least: i) 40°C</p>
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<p>for plains, ii) 30°C for hilly regions and ii) 37°C for coastal areas. However, the IMD considers a heat wave in terms of not only departure from this normal maximum but also actual temperature in a particular region:</p> <ol style="list-style-type: none"> 1. A heat wave is considered if the temperature increases by 4.5°C from this normal maximum, and a severe heat wave is declared if the temperature increases by 6.5°C from this normal maximum. Or, 2. A heat wave is considered if the actual temperature is 45°C, while a severe heat wave is considered when the actual temperature is 47°C. <p>If the above criteria are met in at least two stations in a Meteorological sub-division for at least two consecutive days, a heat wave or a severe heat wave is declared by the IMD on the second day.</p> <p>In 2015, South Asia witnessed one of world's five deadliest heat waves in history, killing an estimated 3,500 people in Pakistan and India. In India, the heatwave deaths touched upto 2500 in 2015, mostly from AP, Telangana and Odisha. Reason for greater heat-related deaths in these states is a trough over these states in April and May that attracts dry and warm north-westerly winds, raising the temperatures unusually higher than normal.</p> <p>110. D</p> <p>There are three basic types of forest fires:</p> <ol style="list-style-type: none"> 1. Surface fires burn only surface litter and duff. These are the easiest fires to put out and cause the least damage to the forest. a gap in vegetation or other combustible material 2. Ground fires (also "underground or subsurface fires") occur in deep accumulations of humus, peat and similar dead vegetation that become dry enough to burn. These fires move very slowly, but can become difficult to fully put out as they can smoulder all winter underground and then emerge at the surface again. 	<ol style="list-style-type: none"> 3. Crown fires spread from tree top to tree top and burn trees up their entire length to the top. These are the most intense and dangerous, particularly in a coniferous forest because resinous material given off burning logs burn furiously. <p>According to the FSI's 2019 report on fire-prone forest areas, more than 36% of Indian forest cover is prone to frequent forest fires and, compared to the forest fires in USA and Australia, those in India occur largely due to human actions. The dry deciduous forests of Central and South India, the fires occur particularly in cases where people leave burning bidis, cigarette stubs or other inflammable materials. By contrast, the north-east has the tropical evergreen forests which are not likely to catch fire easily. But a major reason for forest fires in here is slash-and-burn or jhum cultivation. The fires could be a cause of forest cover decline particularly in Mizoram, Arunachal Pradesh and Nagaland. The coniferous (chir pine) forests of Western Himalayas are equally prone. Two years of drought and a rise in the average temperature, low relative humidity and strong winds had all contributed to the 2016 forest fires, which were largely ground fires, in Uttarakhand.</p> <p>Generally, the fire spreads only if there is continuous supply of fuel (dry vegetation) along its path. The best way to prevent the fire from spreading is to create firebreaks, long narrow gaps on the ground surface where there is not vegetation or other combustible forest litter. In British india, fire was prevented by removing forest litter all along the forest boundary, which was called "Forest Fire Line". But under the warming climate, the older ways of containing forest fires will become obsolete. Australia's forest fire management rules are considered the best in the world; yet, they failed to control the fires. For example, in 2019-20, the fire in 2019-20 was of the 'Crown Fire' type and so, the fire lines or</p>
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<p>fire breaks didn't work. Crown fires burns the top of trees, and spread rapidly via wind. The eucalyptus plantations, being promoted widely in India, have been singled-out for crown fires.</p> <p>111. D</p> <p>A hazard is "a dangerous physical phenomenon that may cause damage to life, property, livelihoods and environment", while a disaster is an extraordinary hazard that causes widespread loss of life or human suffering, or damage to property thereby seriously disrupting the normal functioning of the society. A hazard is a threat or event with the potential to cause damage, while a disaster is an event that causes damage as a consequence of the hazard.</p> <p>A hazard or disaster could be man-made like environmental pollution, leakage of toxic wastes, explosion, dam failure, war or civil strife, etc. Or it could be naturally occurring like earthquake, volcanicity, floods, landslides, tsunamis, etc. Sometimes, certain activities of humans could directly result in disasters or could aggravate the natural hazards to reach their disastrous proportions causing loss of life and property. Bhopal gas tragedy of 1984 is an example for the first case, and an example for the second case is the frequency and intensity of floods and droughts which have increased in India in the wake of indiscriminate felling of trees, particularly in the catchment areas of rivers.</p> <p>112. A</p> <p>While the term "risk" refers to the possible quantified loss, the level of disaster risk to life and property in an area depends on the nature of the hazard as well as on the vulnerability of that life and property to the impact of the hazard.</p> <p>Vulnerability refers to a set of geographical, socio-economic or political conditions which raise a community's exposure to a hazard or which adversely affect its capacity to cope with the hazard. Vulnerability includes the intrinsic value of the elements affected as well as their functional value in emergency response and post-disaster recovery.</p>	<p>113. D</p> <p>According to UN Secretary-General Antonio Guterres (2017), "the US, followed by China, India, the Philippines and Indonesia, have experienced the most disasters since 1995 - more than 1,600, or once every five days". Losses due to natural disasters are 20 times greater (as % of GDP) in the developing countries than in the industrialized ones. Asia tops the list of casualties due to natural disasters.</p> <p>114. C</p> <p>Due to India's unique geo-climatic conditions and high socio-economic vulnerability, India has been vulnerable, in varying degrees, to numerous natural, as well as, human-made disasters, especially, floods, droughts, cyclones, earthquakes, landslides, avalanches and forest fires. Almost 58% of India's land is prone to earthquakes of moderate to very high intensity; 12% of its land is prone to floods and river erosion; 75% of its coastline is prone to cyclones and tsunamis; 68% of its cultivable area is prone to drought and hilly areas are at risk from landslides and avalanches. Moreover, India is also vulnerable to Chemical, Biological, Radiological and Nuclear (CBRN) and other man-made disasters.</p> <p>115. D</p> <p>The basic reason for India's high vulnerability to natural disasters is its unique geography and geology. Along with the tectonically unstable Himalayan region, the adjacent alluvial plains of Indus, Ganga and Brahmaputra are susceptible to seismicity, landslides, water erosion, etc., because the rocks below the alluvial plains are just extension of the Himalayan ranges only. Even the most stable peninsular part of India witnesses occasional earthquakes indicating the deep underlying geo-tectonic movements.</p> <p>The risk of volcanic eruptions which occur along plate boundaries just like earthquakes is very limited in India. The only active volcano of India is in the uninhabited Barren Island of A&N Islands,</p>
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<p>116. B</p> <p>117. C</p> <p>118. A</p>	<p>and lies over the fault whose movement caused the tsunami on December 26, 2004.</p> <p>An earthquake refers to the vibration of earth crust caused when the crustal rocks have been suddenly disturbed and strained beyond their elastic capacity. Their magnitude is measured by Rictor Scale and ranges between 0 and 10. High intensity earthquakes are relatively fewer in number, but earthquakes of over 5.5 magnitude are progressively damaging to property and life. Apart from the immediate damage to life and property, earthquakes destabilize the earth's crust leaving scope for failure of dams, flash floods and landslides in future.</p> <p>In March 2021, MoHA formulated a Comprehensive National Earthquake Risk Mitigation (CNERMP) project for 20 States and 4 UTs of seismic zone III, IV, V in 3 phases over the next 10 years. Half of its estimated financial outlay (5,537 crore) will be provided by the World Bank. The CNERMP has the following components:</p> <ol style="list-style-type: none"> 1. Earthquake Engineering Education 2. Institutionalizing culture of earthquake safety 3. Monitoring and estimating earthquake hazard 4. Introducing risk mitigation at municipal and village levels 5. Developing earthquake-resistant technologies <p>A tsunami in the deep ocean has a very long wavelength of over 100 km but an amplitude of only about 1 km. Hence, though it travels at a high speed of 800 km/h almost like a jet aircraft, it remains undetected by ships in the deep sea and it only appears like a gentle rise and fall of sea water. However, when it reaches shallow waters along the coast, its speed and wavelength are greatly reduced to reach an enormous height of over 30 meters and</p>	<p>act as a dangerous wall of water on the coast. The arrival of a tsunami into a coastal area is signaled by the sudden recession of sea water, which exposes the ocean floor. Consequent upon a larger tsunami wave, successive edge waves enter the coastal zone with the time interval of 20-40 minutes and with great force. Thus, tsunami is a multiple wave phenomenon.</p> <p>119. C</p> <p>Tsunami is a series of huge water waves generated by sudden vertical displacement of the ocean floor and overlying water following an under-sea disturbance such as earthquake or a landslide or an explosive volcanic eruption or a meteorite.</p> <p>Most (85%) of the tsunamis are generated by undersea earthquakes. Although no documented tsunami has ever been generated by an asteroid impact, such an event would be disastrous. Most meteorites burn as they reach the earth's atmosphere. However, large meteorites hit the earth's surface in the distant past, as indicated by large craters found in different parts of the world.</p> <p>On Dec 26, 2004, at 7:59 AM local time, the earthquake ruptured a 900-mile stretch of ocean floor along the fault plane between Indian and Burma plates. Rather than delivering one violent jolt, the rupturing along the 1200 km-long fault line lasted for 10 minutes, causing the Earth to vibrate up to a centimeter. This earthquake occurred as the denser Indian plate was suddenly subducted or pushed below the lighter Burma plate leading to the upthrust of the lighter plate margin lifting the sea floor by 10 meters. Consequently, the sudden upward movement of huge water column triggered tsunami waves across the Indian ocean over the next 7 hours and the waves of about 10 m height inundated the coastal areas and killed over 230000 people, especially in Indonesia, Sri Lanka, India and Thailand, destroyed coastal transport, communication and other infrastructure, submerged beaches or</p>
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<p>120. A</p>	<p>stripped them of their sand, dislocated islands and adversely affected marine life and coastal vegetation.</p> <p>India is the most flood-prone country in the world. Floods occur in almost all rivers basins. The principal reasons lie in the very nature of India's natural ecology, namely, the monsoonal climate, the high siltation of river beds and the steep and highly erodible mountains, particularly in the Himalayas. About 85% of India's annual rainfall is concentrated in 3-4 months (June-Sep) and is unevenly spread across the country, thereby making 12% of its area prone to floods. Most of the floods occur during this monsoon period and are associated with tropical storms or depressions and active or break monsoon conditions. Further, India's vulnerability to the flood hazard is also increased by man-made factors such as high population density, enormous pressure on land, deforestation and mining and quarrying especially in the hilly areas, and the encroachment of flood plains, wetlands and other waterways.</p> <p>Many tributaries of the Ganga and Yamuna and Tapi experience "back-flooding" when large floods occur in the main river channel and the flood water proceed up the tributary for significant distances.</p>	<p>Barak) which, during the monsoon period, receive enormous amount of water and sediments from their numerous tributaries descending the surrounding hilly States from almost all sides. As a result, Assam's flood-prone (40%) is almost four times the flood-prone area of the country. Another major problem in Assam is bank erosion by the rivers, Brahmaputra, Barak and their tributaries. As a result, the Brahmaputra river is 5.46 km wide on average, but has widened to 15 km in some places thereby eating away thousands of villages and rendering the inhabitants homeless and landless in a State where over 75% of population depends on agriculture.</p> <p>122. A</p> <p>Uttarakhand/Kedaranath floods occurred in 2013</p> <p>123. D</p> <p>Land including flood plains is a State subject. In 1975, a model bill for floodplain zoning was sent to the states. Along with erstwhile State of Jammu & Kashmir, only three states - Manipur, Rajasthan and Uttarakhand - have enacted such laws so far, and even in these states, implementation is virtually absent. The policy on River Regulation Zones had been in the works since 2002, but work on it received a boost only after the June 2013 floods in Uttarakhand, the country's biggest natural disaster since the 2004 tsunami. Finally, in 2016, the draft RRZ policy was sent to all the states, which proposes to create three river conservation zones (RCZs)-prohibited activities zone, restricted activities zone and regulated activities zone-in floodplains. For mountain rivers, the policy proposes two zones-a prohibited activities zone and a restricted activities zone. The policy was opposed by many states, presumably because of the political and practical challenges of implementing them in heavily populated areas with lots of rivers.</p>
<p>121. D</p>	<p>Various factors make Assam different from other states so far as extent and duration of flooding and magnitude of river bank erosion are concerned. While natural topography and high annual rainfall are obvious causes of floods, the situation is worsened by human factors like encroachment of river banks and wetlands, lack of drainage, unplanned urban growth, hill cutting and deforestation. Drainage is the process of removing excess water and moisture from an area.</p> <p>Assam is made up almost entirely of two major river valleys (Brahmaputra and</p>	

<p>124. A</p> <p>In 2018, Kerala's worst floods since 1924 were caused not just by extreme rainfall and mismanagement of dam reservoirs, but also by mining and construction in the Western Ghats. Especially the 2019 floods were called a man-made ecological disaster because the escalation of deaths up to 121 in the floods is largely the result of some 83 landslides in the span of 2 days. 62% of Kerala's total 5,924 quarries are in the ecologically sensitive zones identified by Gadgil along the Western Ghats.</p> <p>A 2016 study in association with the National Centre for Earth Science Studies (NCESS) found that except Trivandrum, Kollam and Alappuzha, all districts reported soil piping phenomenon and listed Kerala as 'at risk'. Also known as 'tunnel erosion', soil piping is the subsurface erosion of soil caused by percolating waters to produce underground pipe-like conduits, especially in non-lithified earth materials. Despite warnings, soil piping has caused devastating landslides in Idukki, Wayanad and Malappuram districts during the 2018 floods.</p>	<p>and hence can't hold accumulated water resulting in downpour.</p> <p>126. D</p> <p>As a mature tropical cyclone passes by a particular place, the place witnesses sudden rise in temperature and wind speed. Then the cirrus clouds appear because above the rainbands exist an upper-level cirrus and cirrostratus overcast spiralling anticyclonically (clock-wise) outward from the eyewall. Unlike usual cirrus clouds, they have tails in the direction from which the cyclone is approaching. Within a few hours, the cirrus clouds finally turn cumulonimbus. As a result, heavy rain, thunder, lightening and reduced visibility continue only for a few hours.</p> <p>The arrival of the eye brings calm breezes and almost clear sky, often enabling people to see stars at night. This is the proverbial calm before the storm and it continue for not more than an hour. Again, with the arrival of rear portion of the cyclone, wind direction changes, air pressure rises and the sky becomes cloudy producing heavy rain, thunder and lightning for several hours. After the cyclone passes, weather turns normal and the sea surface calm.</p>
<p>125. C</p> <p>A cloudburst is a sudden downpour for short duration and within a small area of 20-80 square kilometers, leading to flash floods, debris flows and mudslides. A cloudburst is different from rain only in the amount of water and the IMD labels rainfall over 100 mm per hour as cloudburst. On an average, most places in India get around 20 mm of rain in 24 hours during the monsoons.</p> <p>The warm air current from the ground or below the clouds rushes up pushing the clouds and at times even the falling raindrops up with it. Hence, the clouds don't shed rain and as the warm air rises up, more and more water droplets are formed so that the clouds get bigger due to excessive condensation. When the clouds reach a height where there is almost no air, the clouds stop moving up, start cooling</p>	<p>127. C</p> <p>The developing cyclone will also cool the underlying ocean in many ways: i) by evaporating its water and producing rain over it, ii) the cyclone's strong surface winds cause turbulence and vertical mixing in the sea surface water, iii) the wind stress also moves the sea surface water away from the cyclone's Centre thereby causing upwelling of cold water from below. On the other hand, the supply of heat and moisture for the cyclone will be cut off if the sea water is not warm and deep enough. Hence, the tropical cyclones occur mostly on the western margins of tropical oceans because warm ocean currents reach there under the influence of easterly trade winds whereas the cold currents lower the surface temperature of the eastern tropical oceans.</p>

<p>128. D</p>	<p>Unlike floods, earthquakes, and cyclones, droughts have certain distinct features:</p> <ol style="list-style-type: none"> 1. its onset is slow giving room for adequate warning, 2. it affects livelihoods of people over a large area, 3. the disaster's duration is much longer and so the relief efforts have to be sustained over entire period, 4. it is basically confined to rural areas except that very severe drought may also impact on urban water supply by drying up sources and reducing groundwater tables, and 5. it offers scope for reducing vulnerability by improving moisture conservation and vegetal cover, etc. <p>Drought is not the only disaster that affects price level in the economy but it has the largest impact on the price level.</p>	<p>powers under the Epidemic Diseases Act of 1897 to issue further directions. For instance, the Tamil Nadu issued a government order on March 23, 2020, to impose social distancing and isolation measures which directed "suspected cases and foreign returnees" to remain "under strict home quarantine" and people "to stay at home and come out only for accessing basic and essential services and strictly follow social distancing norms".</p>
<p>129. C</p>	<p>130. B</p>	<p>131. B</p>
<p>130. B</p>	<p>Though the Constitution is silent on the subject 'disaster', the legal basis of the DM Act, is Entry 23, Concurrent List of the Constitution "Social security and social insurance". Entry 29, Concurrent List "Prevention of the extension from one State to another of infectious or contagious diseases or pests affecting men, animals or plants," can also be used for specific law making.</p> <p>On March 24, 2020, under the Disaster Management Act 2005, the National Executive Committee (NEC), the executive committee of the National Disaster Management Authority (NDMA), issued orders directing the Union Ministries, State governments and authorities to take effective measures to prevent the spread of COVID-19, and laid out guidelines illustrating which establishments would be closed and which services suspended during the lockdown period.</p> <p>Taking a cue from the guidelines, the State governments and authorities exercised</p>	<p>• According to the India State of Forest Reports, the forest cover in Telangana was 19,854 sq.km in 2015, which subsequently increased to 20,582 sq.km in 2019 and to 21,214 sq.km in 2021, registering a remarkable increase of 6.85 % in forest cover from 2015 to 2021.</p> <p>• Hyderabad registered the highest decadal growth rate of forest cover at 146.8% between 2011-21 among the seven megacities of Ahmedabad, Bengaluru, Chennai, Delhi, Kolkata and Mumbai.</p> <p>Therefore, Option 2 is the correct answer.</p> <p>132. A</p> <p>As the 11th largest State in the country, the geographical area of Telangana is 1,12,077.41 Sq. Km, of which 24.06% i.e., 26,969.61 Sq. Km is forest area. Of this total forest area, 8,494 sq.km (31.49%) is Open Forest (OF), 8,651 sq.km (32.07%) is Moderate Dense Forest (MDF), 1,551 sq.km (5.75%) is Very Dense Forest (VDF), while the other 8,274 sq.km (30.67%) includes scrubs, non-forest & water bodies (from inside the forest area).</p> <p>Therefore, Option 1 is the correct answer.</p> <p>133. A</p> <p>Northern Telangana Zone:</p> <p>This Zone includes the districts of Adilabad, Komuram Bheem Asifabad, Nirmal, Mancherial, Karimnagar, Peddapalli, Jagitial, Rajanna Sircilla, Nizamabad and Kamareddy.</p>

<p>Annual rainfall ranges from 867 mm to 1189 mm, received mostly from the south-west monsoon. During the monsoon season, maximum temperatures ranges between 32 C to 37 C and minimum ranges between 14 to 25C. Red soils of different textures are predominant in this zone. It has shallow black soils, deep calcareous soils and red clayey soils.</p> <p>134. A</p> <p>The sex ratio for Telangana state is 988 according to 2011 Census. One distinguishing feature is that the sex ratio in the districts of Nizamabad, Adilabad, Karimnagar and Khammam is over 1,000. The sex ratio of the SC population at 1,008 in 2011 is much higher than the State average of 988 in all districts, except Rangareddy, Hyderabad and Mahabubnagar districts. The sex ratio of ST population at 977 is marginally lower than the State average of 988, but it is higher in Adilabad, Karimnagar, Nizamabad and Khammam districts.</p> <p>Therefore, Option 1 is the correct answer.</p> <p>135. D</p> <p>Chromite: It is found in Khammam District (insitu in the form of lenticular pockets) It is also found as float ore in Bhimavaram, Gauraram, Jannavaram, Imamnagar and Enkuru</p> <p>Manganese: Manganese ore with very low phosphorous content is found in Adilabad district. The areas in Adilabad district are Jamdapur, Guda, Kotkuri, Pipalkoti, Pipalgaon, Gunjala.</p> <p>Asbestos: Cross-fibre chrysotile asbestos is found in Somasila of Nagarkurnool district.</p> <p>Uranium: It is found in the areas of Lambapur, Pulicherla, Namapuram, Yellapuram of Nalgonda district</p>	<p>136. D</p> <p>In Telangana state, nearly 26% of geographical area is covered by black soils. Karimnagar district is covered by black soils only.</p> <p>Mixed black and red soils cover nearly 7% of geographical area of Telangana state. Adilabad district is having highest mixed black and red soils.</p> <p>Laterite soils are distributed in Zaheerabad, Jharasangam, Nyalkal and Kohir mandals in Sangareddy district. Laterite soils covers nearly 2% of the geographical area of the state</p> <p>137. A</p> <p>Kawal Tiger Reserve @ Jannaram mandal , Mancherial District</p> <ul style="list-style-type: none"> Govt of India declared Kawal wildlife sanctuary as Tiger Reserve in 2012. The reserve is the oldest sanctuary in the northern Telangana region of the state. This sanctuary is catchment for the rivers Godavari and Kadam, which flow towards the south of the sanctuary. <p>138. C</p> <p>Seeds in Telangana</p> <ul style="list-style-type: none"> Telangana is already producing almost 50% of the seed produced in the country Karimnagar and Warangal produce about 90% of hybrid paddy speed Nizamabad is considered citadel of hybrid fodder sorghum and bajra seeds Ankapoor is called as Seed bowl of Telangana <p>139. C</p> <p>Manjira Wildlife Sanctuary @ Sangareddy district:</p> <ul style="list-style-type: none"> Originally a crocodile sanctuary developed to protect the vulnerable species mugger crocodile, today it is home to more than 70 species of birds. Man made reservoir It has 9 small islands, including Puttigadda, Bapangadda, Sangamadda
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	<p>and Karnamgadda. These islands contain extensive marshy fringes, which act as nesting sites for aquatic birds.</p> <ul style="list-style-type: none"> • Dry Savannah-type of vegetation is found in the sanctuary. <p>140. B</p> <ul style="list-style-type: none"> • The Municipal Corporation of Karimnagar (MCK) has earned the first Water Plus City certification after Hyderabad under the Swachh Survekshan 2023 Awards. • Both Hyderabad and Karimnagar cities were selected for the award from Telangana. • A total of 15 cities were selected from across the country, where 7 are from South India • Indore has attained the country's first 'water plus city' status in 2021 <p>141. C</p> <p>Sita Rama Lift Irrigation Project:</p> <ul style="list-style-type: none"> • Completing the canals would extend irrigation to over 1.6 lakh acres of land in Khammam district, directly benefiting millions of farmers and their livelihoods. • The improved irrigation translates to increased agricultural productivity, leading to economic growth and rural development. • Sita Rama Lift Irrigation Project is a barrage across Godavari River with run-of-river hydroelectric power project at Dummugudem village, Bhadradri Kothagudem district in Telangana. • The project is proposed at about 200 meters downstream of the existing Dummugudem anicut built about 150 years ago. <p>142. D</p> <p>Musi River:</p> <ul style="list-style-type: none"> • It is a river that flows through the southern Indian state of Telangana. It is a tributary of the Krishna River on 	<p>the Deccan Plateau. It was known as the Muchukunda River in earlier days.</p> <ul style="list-style-type: none"> • It originates in Ananthagiri hills in Vikarabad district about 100km away from the city, passes through Hyderabad for about 55km, before entering Nalgonda and merging with Krishna at Vadapally village in Suryapet district on Telangana-Andhra borders about 130km away. • Dams: Himayat Sagar and Osman Sagar are the two dams that are constructed over the river. <p>143. B</p> <p>The Teja Chilli of Telangana is the most popular chilli in many countries. Khammam Agriculture market is one of the biggest chilli markets in Telangana. It is the largest producer of Teja Chilli. The Teja Chilli is the major ingredient of Oleoresin. The chilli is a sub-variety of Guntur Chillies. Of all the Guntur Chilli varieties, the Teja Chilli is the finest. Other Guntur Chilli varieties are Madhubala, Bedki, Roshni, Ankur, etc.</p> <p>144. C</p> <ul style="list-style-type: none"> • The estimated share of Telangana's population living in urban areas is 47.6% in 2023, whereas only 35.1% of India's total population lives in urban areas. Hence, the urban population of Telangana is projected to be 12.5 percentage points higher than that of the country, and this gap is expected to increase to 18.3 percentage points by 2036. • Telangana's urban areas had a Labour Force Participation Rate (LFPR) and Worker Population Ratio (WPR) of 55.7% and 51.2% respectively in 2020-21, higher than the national level LFPR and WPR of 53.7% and 49.9% respectively. • A majority of urban workers in Telangana (51%) have a regular or salaried job
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<p>145. D</p> <p>Hyderabad has been recognised as "Tree City of the World - 2021" by the Arbor Day Foundation and the Food and Agriculture Organisation (FAO) of the United Nations for the second consecutive year.</p> <p>Hyderabad has been honoured with the "World Green City Award 2022" at the International Association of Horticulture Producers (AIPH) 2022, organised in Jeju, South Korea. The city also won in the category 'Living Green for Economic Recovery and Inclusive Growth'.</p> <p>146. D</p> <ul style="list-style-type: none"> • The municipal administration department has asked all the municipal commissioners to earmark 10% of their civic body's budget for improvement of greenery (green budget) • In order to deal with global warming and climate change, the Urban Local Bodies (ULBs) in Telangana have kept aside 10% of their expenditure for a 'Green Budget'. <p>147. B</p> <p>Physiography of Telangana:</p> <ul style="list-style-type: none"> • Telangana region consists of plain developed on the Archaean Gneisses • It lies in the southern part of Deccan plateau • Telangana plateau is slightly tilting towards east side • Deccan plateau covers 2,04,882 sq.km of area 	<p>148. C</p> <p>Doli Gutta from Venkatapuram mandal is the highest mountain peak (965 metres) in the Northern part of the Deccan Plateau. It is located at the border of Mulugu district in Telangana and Bijapur district in Chattisgarh.</p> <p>149. B</p> <p>According to Met department records, the highest temperature ever recorded in Telangana in the last 120 years was 48.6°C in Bhadrachalam on January 29, 1952.</p> <p>150. D</p> <ul style="list-style-type: none"> • Recently three States, Gujarat, Maharashtra and Telangana, have deferred a proposal, approved by the Centre's Genetic Engineering Appraisal Committee (GEAC), to test a new kind of transgenic cotton seed that contains a gene, Cry2Ai, that purportedly makes cotton resistant to pink bollworm, a major pest. • The cotton seed has been developed by the Hyderabad-based Bioseed Research India with Cry2Ai which makes it resistant to pink bollworm. • The Cry2Ai seed has passed preliminary, confined trials and was recommended by the GEAC to be tested in farmer's fields at Telangana, Maharashtra, Gujarat and Haryana. • Agriculture being a State subject means that, in most cases, companies interested in testing their seeds need approvals from the States for conducting such tests. Only Haryana gave permission for such tests.
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