Test 2 explanation.

1. Ans-D
   Directive Principles of State Policy are enumerated in Part IV of the Constitution.
   The Constitution does not contain any classification of Directive Principles. However , on the basis of their content and direction , they can be classified into three broad categories, viz , socialistic, Gandhian and liberal–intellectual .
2. Ans-B
   The founding fathers preferred the British parliamentary system due to the following reasons:- Familiarity with the System, Preference to More Responsibility, Need to Avoid Legislative —Executive Conflicts, Nature of Indian Society etc.
3. Ans-C
   The right to adequate means of livelihood for all citizens,preservation of the health and strength of workers and children against forcible abuse (Article 39)-DPSP
   Prohibition of traffic in human beings and forced labour (Article 23) , Prohibition of employment of children in factories, etc. (Article 24), Right to livelihood (Article 21)-FR
4. Ans-D
   Laws and rules will not be termed void by the SC if they intend to implement some of the directive principles even if they violate the FRs under Article 14 and 19.
   Judicial review is a basic feature. Any law can be questioned.
5. Ans-A
   There is no such duty to pay taxes. It however is a punishable offence not to pay Taxes
6. Ans- D
   In the Gopalan case (1950), the Supreme Court has taken a narrow interpretation of the Article 21. It held that the protection under Article 21 is available only against arbitrary executive action and not from arbitrary legislative action . This is because of the expression 'procedure established by law' in Article 21, which is different from the expression 'due process of law' contained in the American Constitution. But , in Menaka case (1978), the Supreme Court overruled its judgement in the Gopalan case by taking a wider interpretation of the Article 21. Therefore, it ruled that the right to life andpersonal liberty of a person can be deprived by a law provided the procedure prescribed by that lawis reasonable, fair and just . In other words, it has introduced the American expression 'due process oflaw'. In effect , the protection under Article 21 should be available not only against arbitraryexecutive action but also against arbitrary legislative action .

   Right to travel abroad is under article 21-not article 19

   The Supreme Court can issue writs only for the enforcement of fundamental rights whereas a high court can issue writs not only for the enforcement of Fundamental Rights but also for any other purpose. The expression 'for any other purpose' refers to the enforcement of an ordinary legal right . Thus, the writ jurisdiction of the Supreme Court , in this respect , is narrower than that of high court .
7. Ans-C
   To protect the weaker sections from social injustice-is not a fundamental duty.
8. Ans-B
   Gandhian principles
   1. To organise village panchayats (Article 40).
   2. To promote cottage industries on an individual or co-operation (Article 43).
   3. To promote co-operative societies (Article 43B).
   4. To promote the educational and economic interests of SCs, ST s, and other weaker sections and protect them from social in justice and exploitation (Article 46).
   5. To prohibit the consumption of intoxicating drinks and drug (Article 47).
   6. To prohibit the slaughter of cows, calves and other milch and draught cattle an d to improve their breeds (Article 48).
9. Ans-D
   To secure equal pay for equal work for men and women (Article 39)- one of the DPSP.
   Article 21 was added by the provision of 86thConstitutional Amendment Act of 2002.
10. Ans-D
    The Citizenship Act of 1955 prescribes five ways of acquiring citizenship, viz , birth , descent ,registration , naturalisation and incorporation of territory :

The Citizenship Act , 1955, prescribes three ways of losing citizenship whether acquired under the Act or prior to it under the Constitution , viz , renunciation , termination and deprivation.

11. Ans-D
    Article 32 confers the right to remedies for the enforcement of the fundamental rights of an aggrieved citizen . This makes the fundamental rights real. The Supreme Court has ruled that Article 32 is a basic feature of the Constitution . Hence, it can not be abridged or taken away even by way of an amendment to the Constitution .
12. Ans-A
    These are the constitutional instructions or recommendations to the State in legislative,executive and administrative matters. According to Article 36, the term 'State' in Part IV has the same meaning as in Part IIIdealing with Fundamental Rights. Therefore, it includes the legislative and executive organsof the central and state governments, all local authorities and all other public authorities inthe country.
13. Ans-C
    Fundamental Duties help the courts in examining and determining the constitutional validity of a law. In 1992, the Supreme Court ruled that in determining the constitutionality of any law, if a court finds that the law in question seeks to give effect to a fundamental duty, it may consider such law to be 'reasonable' in relation to Article 14 (equality before law) or Article 19 (six freedoms) and thus save such law from unconstitutionality.
    They are enforceable by law. Hence, the Parliament can provide for the imposition of appropriate penalty or punishment for failure to fulfil any of them.
14. Ans-B
    To secure for all citizens a uniform civil code throughout the country (Article 44)-One of the DPSP
15. Ans-C
    The Directive Principles resemble the 'Instrument of Instructions' enumerated in the Government of India Act of 1935. These are issued to the Governor-General and to the Governors of the colonies of India by the British Government under the Government of India Act of 1935.
16. Ans-C
17. Ans-D
    In addition to the making of the Constitution and enacting of ordinary laws, the Constituent Assembly also performed the following functions:
    1. It ratified the India's membership of the Commonwealth in May 1949.
    2. It adopted the national flag on July 22, 1947.
    3. It adopted the national anthem on January 24, 1950.
    4. It adopted the national song on January 24, 1950.
    5. It elected Dr Rajendra Prasad as the first President of India on January 24, 1950.
18. Ans-C
    The Citizenship Act of 1955 prescribes five ways of acquiring citizenship, viz , birth , descent , registration , naturalisation and in corporation of territory :
    The Citizenship Act , 1955, prescribes three ways of losing citizenship whether acquired under the Act or prior to it under the Constitution , viz , renunciation , termination and deprivation :
19. Ans-A
    The Parliament can amend the Fundamental Rights for implementing the Directive Principles, so long as the amendment does not damage or destroy the basic structure of the Constitution .
20. Ans-D
    DPSP require legislation for their implementation. They are not automaticallyenforced.
    The courts cannot declare a law violative of any of the Directive Principles asunconstitutional and invalid. However, they can uphold the validity of a law on theground that it was enacted to give effect to a directive. (note that The courts are bound to declare a lawviolative of any of the FundamentalRights as unconstitutional and invalid.)
21. D
    The early Vedic society was pastoral. Cattle rearing was dominant occupation. Society was nomadic or semi-nomadic. Use of iron helped them to clear forests in Gangetic plains and slowly move there.
22. (d)

The Vedic literature consists of the four Vedas – Rig, Yajur, Sama and Atharva. The Rig Veda is the earliest of the four Vedas and it consists of 1028 hymns. The hymns were sung in praise of various gods. The Yajur Veda consists of various details of rules to be observed at the time of sacrifice. The Sama Veda is set to tune for the purpose of chanting during sacrifice. It is called the book of chants and the origins of Indian music are traced in it. The Atharva Veda contains details of black-magic

23. (d)
The Rig Vedic Aryans worshiped the natural forces like earth, fire, wind, rain and thunder. They personified these natural forces into many gods and worshipped them. Indra was the most popular among them during the early Vedic period. Next in importance to Indra was Agni who was regarded as an intermediary between the gods and people. Varuna was supposed to be the upholder of the natural order. There were also female gods like Aditi and Ushas. There were no temples and no idol worship during the early Vedic period. Prayers

24. (b)
The term Prakrit, which includes Pali, is also used as a cover term for the vernaculars of North India that were spoken perhaps as late as the 4th to 8th centuries, but some scholars use the term for the entire Middle Indo-Aryan period. Middle Indo-Aryan languages gradually transformed into Apabhraṃśa dialects, which were used until about the 13th century. The Apabhraṃśas later evolved into Modern Indo-Aryan languages. The boundaries of these periods are somewhat hazy, not strictly chronological. Modern North Indian languages are often considered to have begun to develop a distinct identity around the 11th century - while Apabhraṃśas were still in use - and became fully distinct by the end of the 12th century.

25. (b)
The political structure of Rigvedic India can be traced in the following ascending order:

- The family or Kula
- The village or Grama
- the clan or Vis
- The people or Jana
- The country or Rashtra

26. (a)
The four divisions of society (Brahmins, Kshatriyas, Vaisyas and Sudras) or the Varna system was thoroughly established during the Later Vedic period. The two higher classes - Brahmana, and Kshatriya enjoyed privileges that were denied to the Vaisya and Sudra. In the family, the power of the father increased during the Later Vedic period. There was no improvement in the status of women. They were still considered inferior and subordinate to men. Women also lost their political rights of attending assemblies. Vaisyas also carried on trade and commerce. They organized themselves into guilds known as ganas. Besides nishka of the Rig Vedic period, gold and silver coins like satamana and krishnala were used as media of exchange.

27. (d)
Self-explanatory

28. (b)
Anekāntavāda refers to the Jain doctrine about metaphysical truths that emerged in ancient India. It states that the ultimate truth and reality is complex, has multiple aspects.

29. (b)
To communicate with common people, they used Prakrit, which was the language of common people and discarded Sanskrit, which was spoken by only few. This added to the popularity of Jainism.

30. (a)
The first Buddhist Council was held at Rajagraha under the chairmanship of Mahakasapa immediately after the death of Buddha. Its purpose was to maintain the purity of the teachings of the Buddha. The second Buddhist Council was convened at Vaisali around 383 B.C. The third Buddhist Council was held at Pataliputra under the patronage of Asoka. MoggaliputtaTissa presided over it. The final version of Tripitakas was completed in this council. The fourth Buddhist Council was convened in Kashmir by Kanishka under the chairmanship of Vasumitra. Asvagosha participated in this council. The new school of Buddhism called Mahayana Buddhism came into existence during this council. The Buddhism preached by the Buddha and propagated by Asoka was known as Hinayana.

31. D The elements of weather and climate are the same, i.e. Temperature, Atmospheric Pressure, Wind, Humidity & Precipitation
Air becomes dense and heavy resulting in its sinking, if it is cold, and creates a high pressure area

Low pressure is associated with cloudy skies and wet weather as rising hot air carries water vapour to the upper atmosphere leading to the formation of clouds and eventually rain. Such rainfall is called as conventional rainfall

Absolute Humidity is the actual level of water vapour content in the atmosphere regardless of temperature. It is measured in g/m3

Relative Humidity is the amount of water vapour present in air expressed as a percentage of the amount needed for saturation at the same temperature. It is expressed as % RH

32. A. Consider the below statements regarding atmosphere

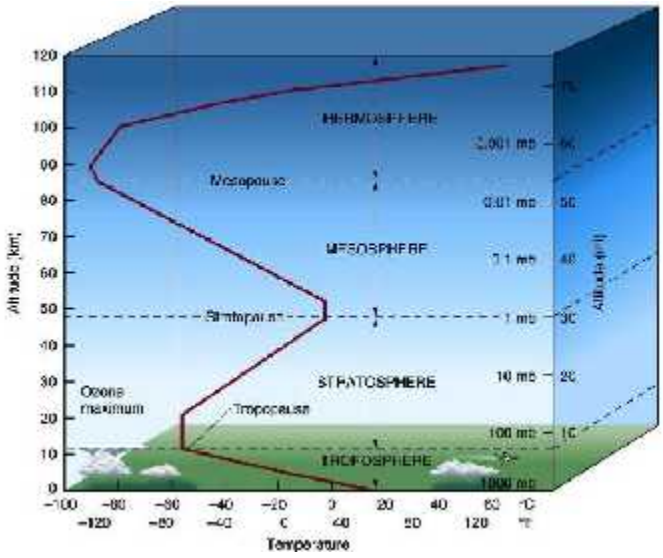
1. 99% of total mass of atmosphere is confined to the height of 32km from earth's surface
2. Nitrogen, Oxygen, Argon and Carbon dioxide are the first four major constituent gases in the atmosphere in decreasing order of its concentration in atmosphere
3. CO_2 is the major factor responsible for greenhouse effect and hence being emphasized to reduce its anthropogenic emissions

33. B Hygroscopic Nuclei are

Hygroscopic Nuclei or condensation nuclei microscopic particles present in the atmosphere which act as the base for water vapour to condense on it when air is saturated, resulting in the formation of rain. The particles can be sulphur dioxide, salt, dust, or smoke. They are water seeking particles are of the size 0.001 μm to more than 10 μm i.e about 1/100th the size of a cloud droplet. Water requires a non-gaseous surface to make the transition from a vapour to a liquid which is provided by the nuclei. The concept of cloud condensation nuclei is used in cloud seeding that tries to encourage rainfall by seeding the air with condensation nuclei. Aerosols that are soluble in water (e.g. salt or sulphuric acid) can induce condensation in unsaturated air, e.g. salt nuclei can induce it at a relative humidity of less than 80%.

34. D Density being mass/ unit volume, is more at lower layers of atmosphere than at higher levels, as 99% of mass of atmosphere is confined to lower layers

The variation of temperature at different layers of atmosphere is different at different layers. In troposphere, temperature decreases with increase in height, while in stratosphere it is the reverse. In mesosphere the temperature decreases with height while in thermosphere it again increases with height. In exosphere temperature is increasing exponentially but the air being thin, we cannot feel the extreme high temperature of exosphere.



The average height of troposphere is 13 km from the earth's surface. Its actual thickness is about 8km near poles and 18 km at the equator. Thickness is more at equator because heat is transported to heights by strong convectional currents.

Temperature decreases @ 1^{O}C/ 165 m or 6.4^{O}C/km approx., called Normal/ Environmental Lapse Rate. Positive if temperature decreases with elevation, Negative if temperature increases with elevation and Zero, if temperature is constant with elevation

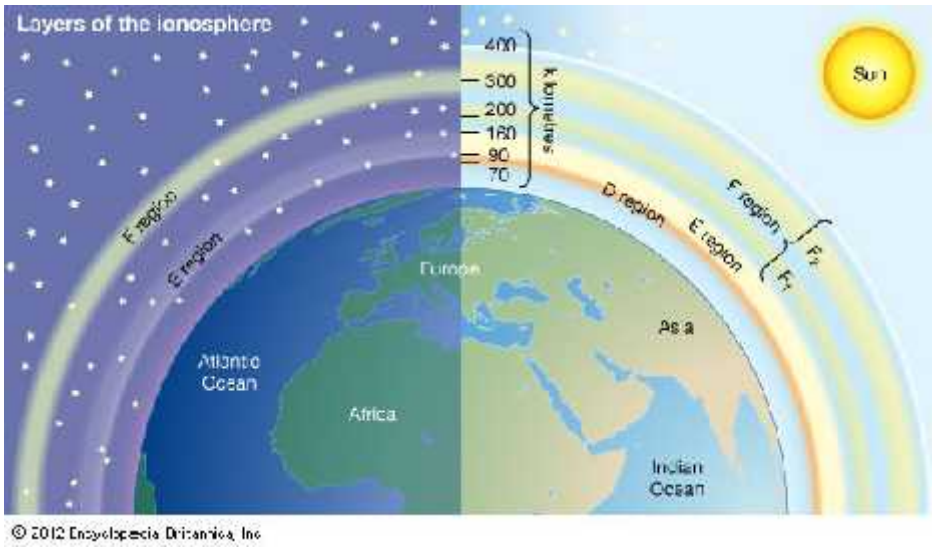
35. C Choose the statement which is ***not*** correct from below

Tropopause at equator is at a height of 18km at equator while at poles it is 8km. With normal lapse rate, i.e. temperature decreases with increase in altitude. So temperature at tropopause above equator is -80^{O}C & is -45^{O}C over poles

All the atmospheric phenomena being concentrated to the troposphere, clouds are concentrated to troposphere itself and stratosphere is free from clouds, which provides hinder free travel for aircrafts

Meteoroids are rock particles in the exosphere. When meteoroid enters atmosphere, it is called meteor. **Meteor** burns in Mesosphere and if it is not burned, it falls on earth as **Meteorite**.

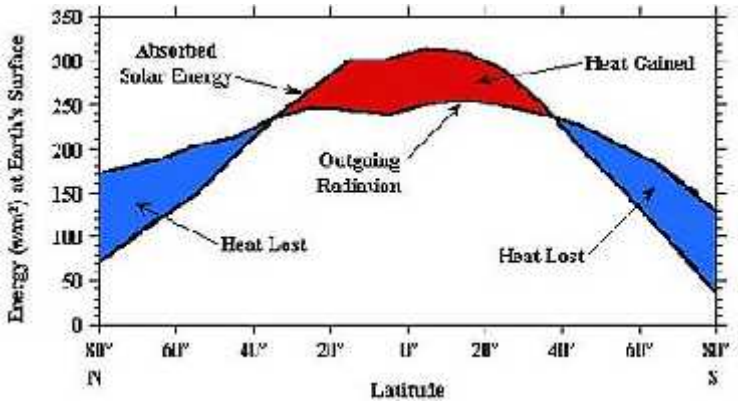
Ionosphere contains electrically charged particles i.e. ions. These helps in reflecting electromagnetic radiation coming from earth there by making radio transmission possible. The amount of ionization varies greatly with the amount of radiation received from the Sun i.e. there would be seasonal and diurnal variation. During daytime hours, it stretches from 50 to 1,000 km and includes the mesosphere, thermosphere, and parts of the exosphere. At night the F layer is the only layer of significant ionization present, while the ionization in the E and D layers is extremely low and D almost disappears. During the day, the D, E and F layers become heavily ionized. F layer forms an additional weak zone F1. F2 layer persists by day and night and is the region mainly responsible for the refraction of radio waves. D layer absorbs signals especially AM signal, while E and F layers are those reflecting ones and are used for communication. Signals greater than 40MHz frequency would penetrate through the ionosphere.



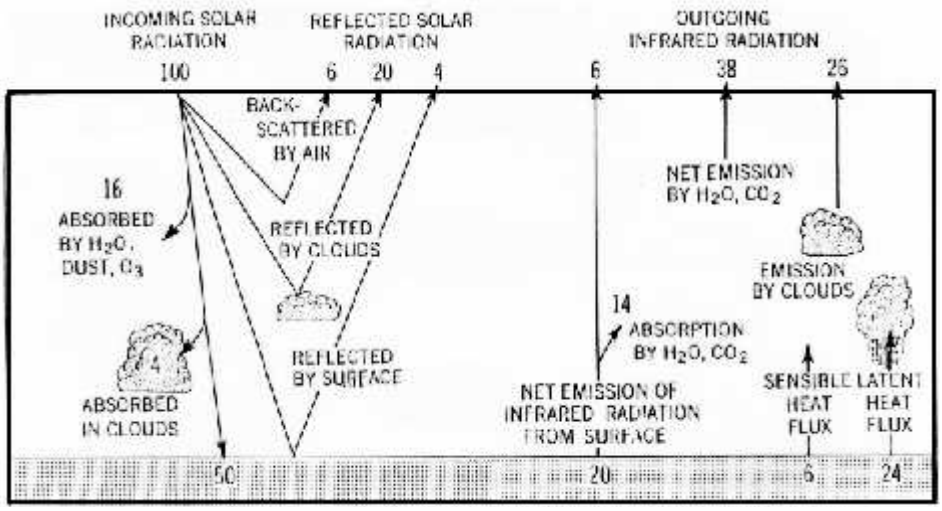
36. D Earth receives most of the energy from sun in short wavelengths and is called as insolation. Earth receives 1.94 cal/cm^2 of energy every minute, at the top of its atmosphere Receipt of insolation varies with the changing apparent distance of earth from sun. Factors that cause variation in insolation includes

1. **Rotation of earth/ inclination of earth:** Earth's axis makes an angle of 66½^o with the plane of its orbit, which has an influence on the amount of insolation received.
2. **Angle of inclination of sunrays:** At higher latitudes, areas covered by vertical rays of sun is less than the area covered by slant rays. Slant rays pass through atmosphere longer, resulting in more absorption, scattering and diffusion
3. **Length of the day**
4. **Transparency of the atmosphere:** Atmosphere is highly transparent to short wave radiations. Water vapor, ozone and gases absorb much of the near infrared radiation. Suspended particles can scatter visible spectrum
5. **Configuration of land:** Insolation is 320 Watts/m2 in tropics while it is 70 Watts/m2 in poles. Maximum insolation is at subtropical deserts, where cloudiness is least. Equator receives less insolation. Insolation is more over continents than oceans even in same latitudes
6. **Revolution of earth in an elliptical orbit:** Sun being at one of the foci of the elliptical is at different distance from earth during different periods of a year. Insolation will be maximum at perihelion while it will be minimum at aphelion

37. C Amount of insolation will always be equal to amount of back radiation or terrestrial radiation. This balance is maintained throughout and this is termed as Global Heat Budget. Some area on earth's surface has surplus receipt of energy while some area has deficit. Between 40^{O}S & 40^{O}N, there is surplus receipt, while from 40^O to poles, it is deficit.



Surplus heat from tropics is redistributed pole wards, which prevents progressive heating up of tropics and permanent freezing of high latitudes. The distribution or transfer of heat in earth's atmosphere happens through 3 phenomena. Air in contact with the land gets heated slowly and the upper layer in contact with the lower layers get heated by **conduction.** Air in contact with air rises vertically on heating, as currents and transmits heat to the atmosphere, called **convection**, which is confined to troposphere only. Transfer of heat through horizontal movement of air is called **advection.**



38. A Atmosphere is indirectly heated by terrestrial radiation from below and so atmosphere close to sea level atmosphere records higher temperature.

Sea gets heated slowly and loses heat slowly compared to land, which eventually contributes to breezes which moderates temperature. If sea is hot and land is cool, it will cause **land breeze** as seen during night. During day time it is vice versa and the phenomena is called **sea breeze**. The proximity to the sea is thus a regulator of atmospheric temperature

Isotherms are the lines that join places having equal temperature on a map for which the average of the sea level temperature of the location is taken as the reference. This is to nullify the effect of altitude on temperature difference. Thus isotherm effectively represents that latitudinal variation of temperature.

Isotherms are generally parallel to the latitudes in Southern Hemisphere throughout the year owing to the vast spread of oceans, which maintains uniform temperature along the latitudes through effective distribution of temperature in ocean water.

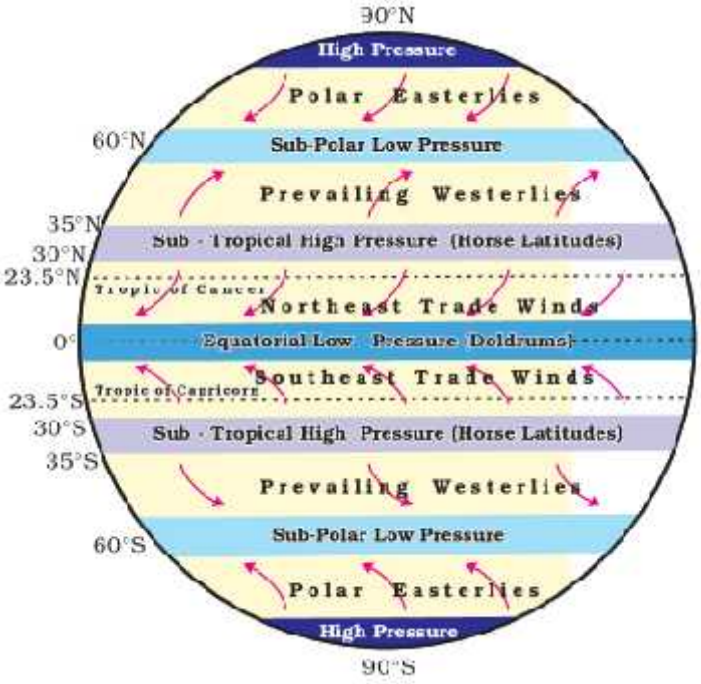
In Northern Hemisphere, the isotherms are generally parallel to the latitude in July, when sun is prominently above the Northern Hemisphere. A deviation from this is visible in January due to continentality. Isotherms deviate to the north over the oceans due to the warm ocean currents flowing to the north and to the south over continents due to the coolness retained by the continents continentality respectively. This is due to the differential heating of land and water

39. B Temperature inversion is the reversal of normal lapse rate. During temperature inversion, temperature increases with increase in altitude. This happens for a short duration but quite often. Over plains, long winter night with clear skies and still air is ideal situation. Heat of the day is radiated off during night and during early morning hours, earth is cooler than air above it. As a result

air in contact with the cool earth surface gets cooled and the temperature of the lower layer of atmosphere will remain less than that of the temperature above it, causing inversion of temperature. As a result, the air being devoid of vertical uplift, remains stable. Stability results in the collection of smoke and dust beneath the inversion layer and spreads horizontally, resulting in fog. Inversion lasts only till sun coming up and starts warming earth. In mountains, Due to air drainage i.e. cold air produced in hills and mountains at night, flows down to valleys due to gravity. This drained air is dense and heavy, gets piled up deeply in valleys, with warm air above, resulting in temperature inversion. Temperature inversion can happen when cold air mass flows beneath cold air mass.

40. A In the lower atmosphere, atmospheric pressure decreases rapidly with height @ 1mb/10m. It does not always decrease at the same rate. The atmospheric pressure at sealevel is approximately 100mb, it is 1 mb at the tropopause at a height of about 10km and it is 1mb at a height of 50km.

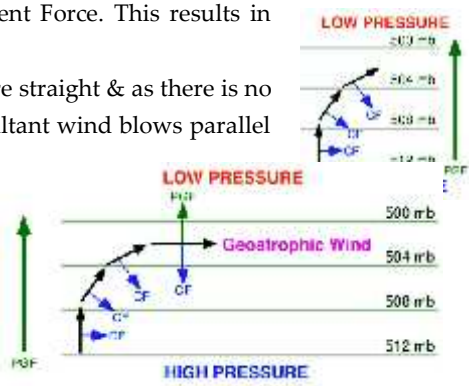
Vertical pressure gradient force is much larger than horizontal pressure gradient but we cannot experience it due to strong gravitational force against the vertical pressure gradient force. We hence experience only horizontal pressure gradient in the form of horizontal winds. The pressure belts of earth is not permanent. It can change upto 10 degree latitudes, in tune with the apparent movement of sun. With increase in latitude, there is no thumb rule that pressure increases. The pressure increase is not just dependent on temperature. Subsidence of air causes high pressure while uplift of air causes low pressure. This establishes pressure belts which are alternatively low and high from equator to poles. This in turn drives the planetary wind system which flows from high pressure belt to low pressure belts.



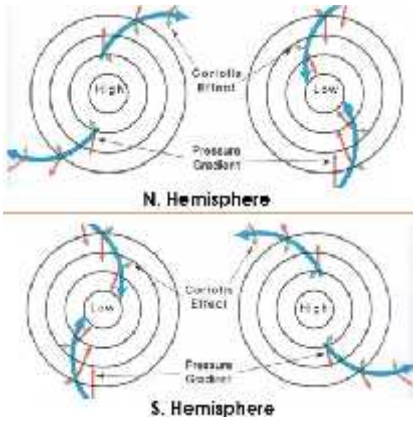
41. D

Rate of change of pressure with respect to distance is the pressure gradient. Wind flows from high pressure to low pressure. When pressure gradient is strong, it implies high pressure is very intense and the resultant will have more strength. The isobars, are closely packed in such case. Surface winds experience friction and in turn affects the wind speed. Friction is greatest at the surface and generally extends upto an elevation of 1-3 km. Force exerted by the rotation of earth. It deflects wind towards right in the N. Hemisphere and to the left in S. Hemisphere. Deflection is more, when the wind velocity is high. Frictional force, reduces the speed, reducing the effect of Coriolis Force and enhancing the effect of Pressure Gradient Force. This results in surface winds to blow out of highs and in towards lows but with a bend.

Horizontal winds in the upper atmosphere has no frictional effect. When isobars are straight & as there is no friction, the Pressure Gradient Force is balanced by the Coriolis Force and the resultant wind blows parallel to the isobar, to form Geostrophic Winds



Cyclonic circulations (low pressure) are anti-clock wise in N. Hemisphere and clockwise in S. Hemisphere while Anti-cyclonic circulations (Highpressure) are clock wise in N. Hemisphere and anti-clockwise in S. Hemisphere

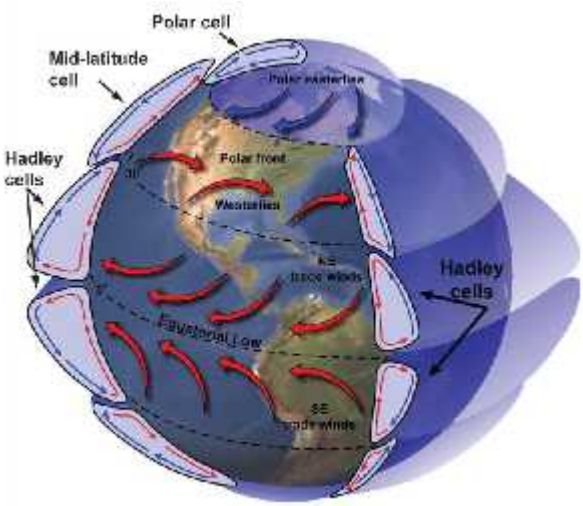


42. B Permanent winds or planetary winds or prevailing winds are namely **Trade Winds** which blows from Subtropical High Pressure Belt (STHP) to Inter Tropical Convergent Zone (ITCZ), **PrevailingWesterlies** which blows from STHP to Sub Polar Low Pressure Belts (SPLP) and **Polar Easterlies** which blows from Polar High Pressure region to SPLP. The winds are named after the direction from which it blows

STHP is also called as **Horse Latitudes** owing to High Pressure of the region and subsiding winds inducing calmness where there is no cloud formation. It extends approximately from 30^{o} to 38^{o} latitudes.

ITCZ is also noted for calm periods when the winds disappear altogether, giving it the name **Doldrums**, which represents a state of inactivity or stagnation. This happens due to the convergence of trade winds from north and south hemispheres. It is the area near the equator and a tracer of the ascending branch of the Hadley cell

43. B . Match the following



There are many local winds across the globe, unique for its features.

Loo: The Loo/ Gurmukhi is a strong, gusty ,hot and dry summer wind from the west which blows over the western Indo-Gangetic Plain region of North India and Pakistan. It is especially strong in the months of May and June. Due to its very high temperatures (45°C–50°), exposure to it often leads to fatal heatstrokes. Since it causes extremely low humidity and high temperatures, the Loo also has a severe drying effect on vegetation leading to widespread browning in the areas affected by it during the months of May and June. It mainly originates in the large desert regions of the northwestern Indian subcontinent and ends in late summer, with the arrival of the Indian monsoon.

Foehn/Föhn: It is a hot, dry and warm wind in Alps found in the leeward side after the moisture content is lost at the windward side. It is a rain shadow wind that results from the subsequent adiabatic warming of air that has dropped most of its moisture on windward slopes. As a consequence, the air on the leeward slopes becomes warmer than equivalent elevations on the windward slopes. Central Europe enjoys a warmer climate due to the Foehn, as moist winds off the Mediterranean Sea blow over the Alps.

The foehn wind's warm temperature to be beneficial to humans in most situations. Winds of this type are also called "snow-eaters" for their ability to make snow and ice melt or sublimate rapidly

Chinook: These are similar to Foehn and blows across the Rockies, from Pacific Ocean. They are also termed as ice eaters. Chinook winds have been observed to raise winter temperature, often from below −20 °C to as high as 10–20 °C for a few hours or days

Mistral: Mistral is a violent, cold, north or northwest wind that blows from southern France into the Gulf of Lion in the northern Mediterranean. It accelerates when it passes through the valleys of the Rhône and the Durance Rivers to the coast of the Mediterranean. It has a major influence all along the Mediterranean coast of France, and often causes sudden storms in the Mediterranean. It is usually accompanied by clear, fresh weather. Its average speed during the day can reach about 50 km/h, calming noticeably at night. The mistral usually blows in winter or spring, though it occurs in all seasons. It sometimes lasts only one or two days, frequently lasts several days, and sometimes lasts more than a week. The mistral takes place each time there is an anticyclone, in the Bay of Biscay, and an area of low pressure around the Gulf of Genoa

44. C Air mass is a volume of air defined by its temperature and water vapour content. Air masses cover many hundreds or thousands of square miles, and adapt to the characteristics of the surface below them, called Source Region. They have very little horizontal variation in temperature and moisture while there can be variations vertically, owing to the closeness to the source region.

They are classified according to latitude and their continental or maritime source regions. Colder air masses are termed polar or arctic, while warmer air masses are deemed tropical. Continental air masses are dry while maritime air masses are moist. Types of air masses include **Maritime Tropical (mT), Continental Tropical (cT), Maritime Polar (mP), Continental Polar (cP)** and **Continental Arctic (cA)**

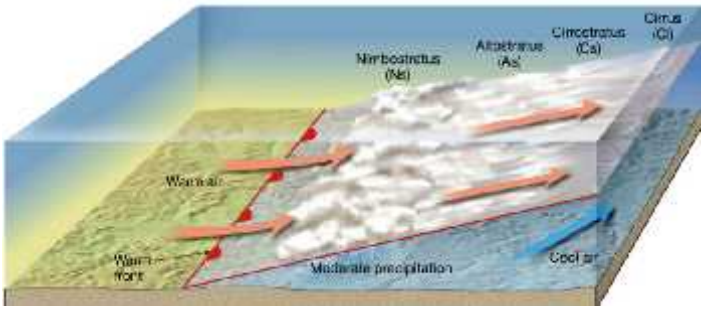
Air mass moves out of their source regions bringing cold, warm, wet or dry conditions to other parts of the world and the underlying vegetation and water bodies can quickly modify the character of air mass. While the classifications are based on source regions, it will be termed as cold or warm with reference to the destination region.

Boundary zone between two different air masses when they meet is called as a Front and the formation of fronts is called **Frontogenesis.** Frontogenesisleads to the formation of temperate cyclones or extra tropical cyclones

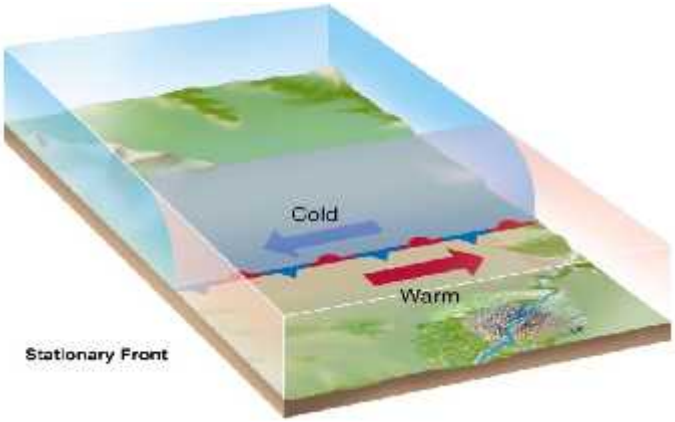
45. B . A front is the boundary zone between two different air masses when they meet and the process is called Frontogenesis. Fronts occur in middle latitudes and are characterized by steep gradient in temperature and pressure. There are mainly 4 different types of fronts.

1. **Cold Front:** When cold air moves towards warm air mass, it is called cold front. Here cold air pushes beneath warm air mass, resulting in the formation of Cumulonimbus clouds due to rising warm air, and hence precipitation.

2. **Warm Front:** When warm air moves towards stationary cold air mass, it is called warm front. Warm air rises over the cold air mass, leading to rain. It forms Nimbostratus, Altostratus, Cirrostratus and Cirrus clouds



3. **Stationary Front:** In this, the front remains stationary without any movement. This happens when neither of the air masses are strong enough to replace the other. Wide variety of weather can be found, usually clouds, prolonged precipitation, and storm trains are found. With enough water vapor in the warmer air mass, rain can occur



4. **Occluded Front:** An occluded front is formed during the process of cyclogenesis, when a cold front overtakes a warm front. When this occurs, the warm air is separated (occluded) from the cyclone center at Earth's surface.

i. **Cold occlusion**: Air mass overtaking the warm front is cooler than the cool air ahead of the warm front, and plows under both air masses

ii. **Warm occlusion**: Air mass overtaking the warm front is not as cool as the cold air ahead of the warm front, and rides over the colder air mass while lifting warm air.

46. D For temperate cyclone to form there is a need for region of divergence aloft above the developing low-pressure center. This will pull the air that is converging at the surface upward and continue to develop the surface cyclone. Westerly jet streams make it

progress to the east. If the upper levels are not favourable, it won't grow and the mass convergence into the low at the surface will just pile up and fill in the low and it will decay. The energy that maintains the cyclogenesis is the contrast between the properties of cold and warm front that initiated frontogenesis.

Temperate cyclones stretch over 500 to 600 km all along the front. They may spread over 2500 km over North America and has a height of about 8 to 11 km.

Since these cyclones move with the westerlies (Jet Streams), they are oriented east-west. If the storm front is east-west, the center moves swiftly eastwards. If the storm front is directed northwards, the center moves towards the north, but after two or three days, the pressure difference declines and the cyclone dissipates. In case the storm front is directed southwards, the center moves quite deep southwards-even up to the Mediterranean region [sometimes causing the Mediterranean cyclones or Western Disturbances (They are very important as they bring rains to North-West India – Punjab, Haryana during winter).

47. A.

	Tropical Cyclone	**Temperate Cyclone**
Origin	Thermal	Dynamic
Extend	10^o to 30^o N and S	35^o to 65^o N and S, more pronounced in North because of greater temperature contrast
Front	No Frontal System	Forms from frontal system
Formation	Form only on sea with surface temp 26^oC-27^oC	Can form on land and water
Seasonality	Seasonal i.e. late summer	Irregular but more in winter
Size	100-500 kms in diameter	300-2000 kms in diameter
Shape	Elliptical in shape	Inverted V Shape
Rain	Heavy rainfalls of short duration which is highly localized	Slow long duration rainfalls all along the front
Pressure	Steep pressure gradient	Low gradient of pressure
Movement	Direction of movement varies	West to East direction of motion
Temperature	Temperature at the center is equally distributed	All sectors of the cyclone have different temperature
Wind	Centre has no rainfall and wind is calm	Winds and rains are active throughout
Drive	Latent heat of condensation	Densities of air mass
Clouds	Few varieties of clouds are seen	Different types of cloud development
Anticyclones	No association with surface anticyclones	Anticyclones precede and succeed a cyclone

48. B

The Fujiwhara effect, sometimes referred to as Fujiwara interaction or binary interaction, is when two nearby cyclonic vortices orbit each other and close the distance between the circulations of their corresponding low-pressure areas. The effect is named after SakuheiFujiwhara, the Japanese meteorologist who initially described the effect. Binary interaction of smaller circulations can cause the development of a larger cyclone, or cause two cyclones to merge into one. Extratropical cyclones typically engage in binary interaction when within 2,000 kilometres (1,200 mi) of one another, while tropical cyclones typically interact within 1,400 kilometres (870 mi) of each other.

49. C Condensation results in forming dew, frost, fog and clouds with respect to the temperature and location. Dewpoint is the temperature at which saturation happens

Dew: Moisture deposited as water droplets over cool surfaces of solid objects (not nuclei)

Ideal conditions for its formation are clear sky, calm air, high relative humidity, cold and long nights. Dew point must be above freezing point for the formation of dew

Frost: Frost forms on cold surfaces when condensation happens below freezing point. Excess moisture is deposited as minute ice crystals instead of water droplets as in dew. Other conditions required are same as that for dew

Fog: When temperature of an air mass with large amount of water vapour falls suddenly, condensation happens with in itself on fine dust particles to form fog. Fog is a cloud with base at or very near to ground. Visibility becomes very poor. Smoke provides plenty of nuclei for fog formation resulting in smog.Fogs are prevalent where warm air currents meet cold air currents.

Mist: Mist contains more moisture than fog so that each nuclei has a thick layer of moisture on it

Mists are frequent over mountains when rising warm air up the slopes meet cold surface.

Snow: It is one of the solid form, when temperature is less than 0^{o}C &moisture is released as hexagonal crystals (flakes)

Sleet: It is frozen rain drops and refrozen melted snow water. It forms when a layer of air with temperature above freezing point overlies the subfreezing layer near the ground

Hailstones: These are drops of rain after being solidified into small rounded solid pieces of ice

Formed by rain water passing through colder layers. It has several concentric layers one over the other

50. B .Clouds are mass of minute water droplets or tiny ice crystals formed by condensation, in free air at considerable elevations. They are grouped under four types based on height, expanse, density and transparency/ opaqueness

1. **Cirrus**: 8,000-12,000m, thin and detached, feathery appearance, Always white in color
2. **Cumulus**: Cotton wool appearance, 4,000- 7000m, Exists as patches, Seen scattered
3. **Stratus**: Layered clouds covering large portions of the sky. Formed due to loss of heat or by the mixing of air masses of different temperatures
4. **Nimbus**: Black or gray clouds which causes rain, shapeless with thick vapour content, at middle levels or very near to the earth's surface, extremely dense and opaque, sometimes very low and seems to touch the ground

Combination of these 4 basic types can give rise to the flowing types

1. High Clouds

(a) Cirrus
(b) Cirrostratus
(c) Cirrocumulus

2. Middle Clouds

(a) Altostratus
(b) Altocumulus

3. Low Clouds

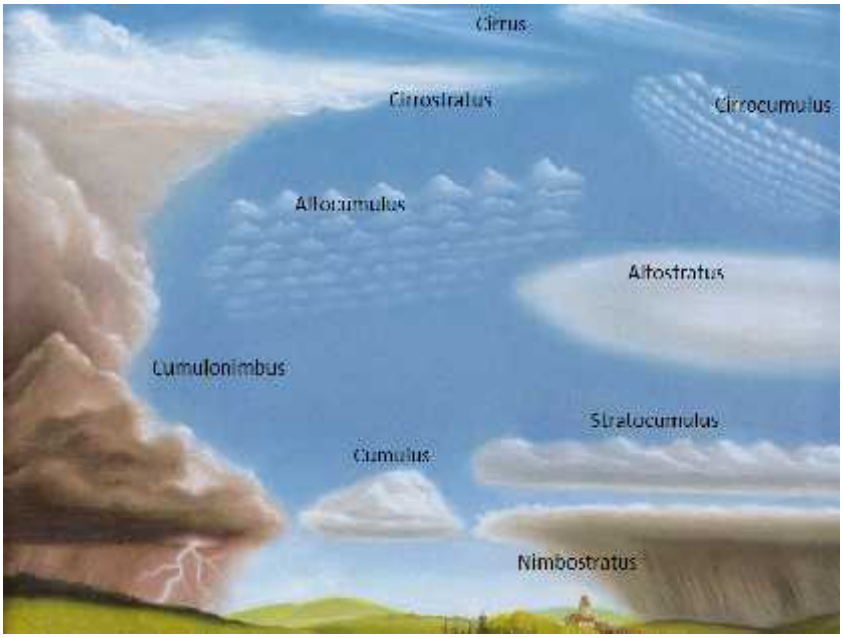
(a) Stratocumulus

(b) Nimbostratus

4. Clouds with vertical development

(a) Cumulus

(b) Cumulonimbus



51. **C**

The Pandyan country was wealthy and prosperous as they profited from trade with Roman empire and sent embassies.

52. **B:**

The village headmen were known as *gramabhojaka*. Most of the time the position was held by the same family. *Gramabhojaka*carried out multifarious functions in the village. He was
responsible for maintaining the law and order and settling the disputes among the people.

53. **C**

54. **C .***Shreni*, in the context of Ancient India was an association of traders, merchants, and artisans. Generally, a separate shreni existed for a particular group of persons engaged in the same vocation or activity. Shrenis have sometimes been compared with the guilds. However, persons engaged in life destroying activities like hunting and fishing did not form any shreni.
Well documented references to the existing of shreni have been found from 5th century BC, and texts pertaining to Buddhism and Jainism mention existence of shrenis and conversion of entire members of some shrenis to Buddhism or Jainism. Over a period of time, some shrenis became very wealthy with surplus resources, and acted as custodians and bankers of religious and other endowments. One of the widely referred shreni was of ivory carvers of Vidisha (located in the modern Indianstate of Madhya Pradesh). This shreni is accredited with sponsoring and financially supporting the construction of the southern gateway of the Stupa at Sanchi, which is currently a World Heritage Site.

55. D. The Empire was divided into four provinces, with the imperial capital at Pataliputra. From Ashokan edicts, the names of the four provincial capitals are Tosali (in the east), Ujjain (in the west), Suvarnagiri (in the south), and Taxila (in the north). The head of the provincial administration was the *Kumara* (royal prince), who governed the provinces as king's representative. The *kumara* was assisted by Mahamatyas and council of ministers. This organizational structure was reflected at the imperial level with the Emperor and his *Mantriparishad* (Council of Ministers)

56. **B**

● IT is CSO under MOSPI which calculate National income of India.

57. **C**

● If a company exports a product at a price lower than the price it normally charges on its own home market (ie, the exporting

country), it is said to be "dumping" the product. Then duties are imposed on such products by the importing countries to protect the domestic industries

58. **B**
    - Opening of no-frills accounts: Basic banking no-frills account is with nil or very low minimum balance as well as charges that make such accounts accessible to vast sections of the population.
    - Strengthening KYC norms will increase complexities associated with opening accounts.
    - Similarly stringent licensing requirements will inhibit more players from coming into banking business thereby reducing coverage.
59. **C**
    - Twin deficit basically refers to a situation where the country runs relatively large current account and fiscal deficits. Higher twin deficit is inherently destabilizing for the country's economy
60. **C**
    - Article 267 deals with Contingency Fund of India.
61. A
    - Statement 2 is incorrect because GDP does not give any indication about inclusiveness. It si one of the major weaknesses of GDP.
62. A
    - Production taxes are paid by the producer independent of the quantity of production eg: for property.
    - However product taxes are paid according no. of units produced.
63. D
    - The law of diminishing marginal utility is a law of economics stating that as a person increases consumption of a product while keeping consumption of other products constant, there is a decline in the marginal utility that person derives from consuming each additional unit of that product.
    - Example:If you eat one apple, you will be happy. But if you eat one more after that ,the amount of happiness you get will be significantly less . It keeps on reducing as you eat more apples
64. B
    - Public Account of India accounts for flows for those transactions where the government is merely acting as a banker.This fund was constituted under Article 266 (2) of the Constitution. It accounts for flows for those transactions where the government is merely acting as a banker.

    Examples of those are provident funds, small savings and so on. These funds do not belong to the government. They have to be paid back at some time to their rightful owners. Because of this nature of the fund, expenditures from it are not required to be approved by the Parliament. Government can operate the public account and it doesn't need the permission of Parliament in doing so.
    - Small saving fund and climate management fund is credited to the Public account..
65. A
    - Revenue expenditure refers to those payments which will not yield any profit or revenue.
    - Interest payments salaries paid etc comes under this category.
    - Though grants may come under capital expenditure for receiving govt. , they are revenue expenditure for central govt.
    - Also money spent on defence procurements comes under capital expenditure as it involve capital accumulation.
66. First two statements are correct. RBI does not fixes MCLR but individual banks does.
    - Refer : https://www.rbi.org.in/scripts/FS_Overview.aspx?fn=2758
67. A
    - Fiscal consolidation is a process where government's fiscal health is getting improved and is indicated by reduced fiscal deficit. Improved tax revenue realization and better aligned expenditure are the components of fiscal consolidation as the fiscal deficit reaches at a manageable level. Reducing corporate taxes.and Increased market borrowing by government. Will topple the aim of fiscal consolidation , whereas democratic decentralisation has no direct bearing on fiscal consolidation
68. C
    - Option A refers to progressive taxation and B refers to regressive taxation.

● In a proportional tax system, all taxpayers are required to pay the same percentage of their income in taxes. For example, if the rate is set at 20%, a taxpayer earning Rs 10,000 pays Rs 2,000 and a taxpayer earning Rs50,000 pays Rs10,000. Similarly, a person earning Rs1 million would pay the exact same rate, or Rs2,00,000.

69. C,The difference between total revenue and total expenditure of the government is termed as *fiscal deficit*.*Deficit* differs from debt, which is an accumulation of yearly *deficits*.
Gross *Primary Deficit* is Gross Fiscal *Deficit* less interest payments. Net *Primary Deficit* is Net Fiscal *Deficit* minus net interest payments. Net interest payment is interest paid minus interest receipt.
A **revenue deficit** occurs when the net income generated, **revenues** less expenditures, falls short of the projected net income. This happens when the actual amount of **revenue** received and/or the actual amount of expenditures do not correspond with budgeted **revenue** and expenditure figures.
Effective Revenue deficit is a new term **introduced** in the **Union Budget** 2011-12**Effective Revenue Deficit** is the difference between **revenue deficit** and grants for creation of capital assets. In other words, the **Effective Revenue Deficit** excludes those **revenue** expenditures which were done in the form of grants for creation of capital assets aka GoCA.
70. C
● Revenue from cess and surcharge belongs to non-divisible pool of central taxes and hence are not shared with states.Bothcess and surcharge are tax on tax.
● The tax revenue from Cess is first credited to the CFI and the Central Government may, after due appropriation made by Parliament, utilise the money for **the specified purposes.**
● Revenue form Surcharge goes to the consolidated fund of India and **can be spent for any purposes.**

71. C. Ecosystem Definition: Functional units of nature, where living organisms interact among themselves and also with the surrounding physical environment is called ecosystem.
72. B. 1 is true: definition of primary pdn; 2 is Gross Primary Productivity and not NPP .
73. C. Both statements are correct. In an aquatic ecosystem, GFC is the major conduit for energy flow. As against this, in a terrestrial ecosystem, a much larger fraction of energy flows through the detritus food chain than through the GFC.
74. A. zooplankton is primary consumer ; phytoplankton is primary producer

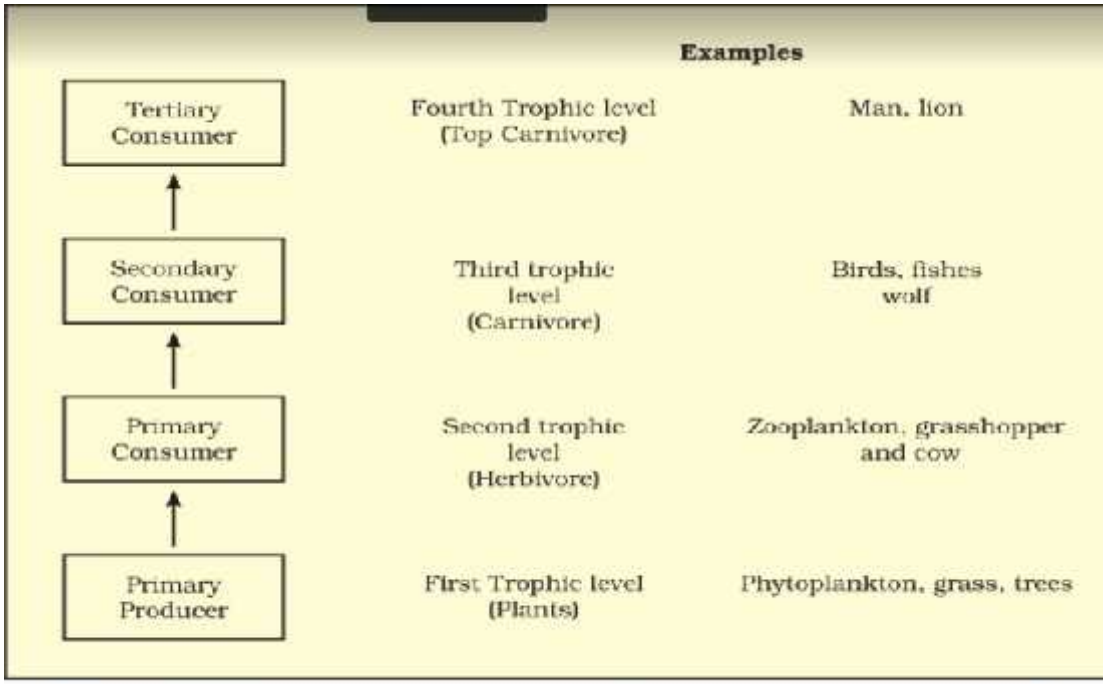


Figure 14.2 Diagrammatic representation of trophic levels in an ecosystem

75. D, Each trophic level has a certain mass of living material at a particular time called as the standing crop. The standing crop is measured as the mass of living organisms (biomass) or the number in a unit area.
76. D. Biomass can be either upright or inverted: Inverted pyramid of biomass-small standing crop of phytoplankton supports large standing crop of zooplankton ; Energy pyramid is always upright.
77. C. The gradual and fairly predictable change in the species composition of a given area is called ecological succession. These changes lead finally to a community that is in near equilibrium with the environment and that is called a climax community. The entire sequence of communities that successively change in a given area are called sere(s). The individual transitional communities are termed seral stages or seral communities. In the successive seral stages there is a change in the diversity of species of organisms, increase in the number of species and organisms as well as an increase in the total biomass. The species that invade a bare area are called pioneer species.
78. B. 2 is true; In secondary succession, since soil is already there, the rate of succession is much faster and hence, climax is also reached more quickly.
79. D. Wikipedia:

80. b ,
    1. Bengal Tiger- ENDANGERED
    2. Indian Rhino- VULNERABLE
    3. Great Indian Bustard -CRITICALLY ENDANGERED
    4. Lion Tailed Macaque- ENDANGERED.
81. (a) It is owned and administered by the Ministry of Agriculture and Food on behalf of the Kingdom of Norway. It is a gene bank built underground on the isolated island in a permafrost zone some 1,000 kilometers from the North Pole. It was opened in 2008 as a master backup to the world's other seed banks, in case their deposits are lost. It is the world's largest repository built to safeguard against wars or natural disasters wiping out global food crops
82. (b) Aedes aegypti, the yellow fever mosquito, is a mosquito that can spread dengue fever, chikungunya, Zika fever, Mayaro and yellow fever viruses, and other diseases. The mosquito can be recognized by white markings on its legs and a marking in the form of a lyre on the upper surface of its thorax. This mosquito originated in Africa, but is now found in tropical and subtropical regions throughout the world.
83. **(c) The Missile Technology Control Regime (MTCR)** -is a multilateral export control regime. It is an informal and voluntary partnership among 35 countries to prevent the proliferation of missile and unmanned aerial vehicle technology capable of carrying above 500 kg payload for more than 300 km. The Missile Technology Control Regime (MTCR) was established in April 1987 by the

G7 countries: Canada, France, Germany, Italy, Japan, the United Kingdom, and the United States of America. The MTCR was created in order to curb the spread of unmanned delivery systems for nuclear weapons, specifically delivery systems that could carry a payload of 500 kg for a distance of 300 km. India is a member, China is not a member.

84. (a) Indian Council for Cultural Relations

It is an autonomous organization founded in 1950 by Maulana Abdul Kalam Azad, first education minister of Independent India.

Main objectives are:

To foster and strengthen cultural relations and mutual understanding between India and other countries. To promote cultural exchanges with other countries and people. To establish and develop relations with national and international organizations in the field of culture.

85. (b) The Indian Parliament passed the Geographical Indications of Goods (Registration and Protection Act) in December 1999 which aimed at providing a registration and also protection of GI of the goods in India. This Act is administered by the Controller General of Patents, Designs and Trade Marks, who is also the Registrar of Geographical Indications. The GI tag is an indication which is definite to a geographical territory. It is used for agricultural, natural and manufactured goods. For a product to get GI tag, the goods need to be produced or processed or prepared in that region. It is also essential that the product has special quality or reputation. Registration of the product under the GI facilitates better legal protection and the authorised user can exercise his right to use the tag effectively. The registration of GI is valid for a period of 10 years each which can be renewed from time to time. If the GI is not renewed then it will be removed from the register.

86. (b) Dvaita Philosophy (Dualism)

It is an outshoot of the Vedanta Philosophy of ancient India. It proclaims that God and Souls are different entities and that souls are not created by God but depend on Him for their existence. This is opposite to Advaita Philosophy of Shankaracharya which believes in Monism (Non-dualism).

87. (b) Archaeologists have spotted a prehistoric rock art site at the foothills of Ambukuthi hills in a village located in SulthanBathery taluk of Kerala's Wayanad district. The site is characterised by petrpgylphs and petrographs similar to those found in Edakkal caves and Thovari hillocks.

88. (c) The Scheme shall support development of core heritage infrastructure projects including revitalization of linked urban infrastructure for heritage assets such as monuments, Ghats, temples etc. along with reviving certain intangible assets. These initiatives shall include development of sanitation facilities, roads, public transportation & parking, citizen services, information kiosks etc. With a duration of 4 years (completing in November 2018) and a total outlay of ₹500 crore (US$78 million), the Scheme is set to be implemented in **12 identified Cities** namely, Ajmer, Amaravati, Amritsar, Badami, Dwarka, Gaya, Kanchipuram, Mathura, Puri, Varanasi, Velankanni and Warangal. It is a central scheme launched by the Ministry of Urban Development.

89. (d) Kambla in its traditional form is non-competitive with buffalo pairs made to race one after another in paddy fields, which is considered a thanksgiving to the Gods for protecting the animals from diseases. Over the years, it has however become an organised sport with animal rights activists claiming that the buffaloes run in the race due to fear of being beaten, which the organisers dismiss, saying no violence is involved and that several modifications had been made to ensure that it is an animal friendly event.

90. (a) The Financial Action Task Force (on Money Laundering) (FATF), also known by its French name, Groupe d'actionfinancière (GAFI), is an intergovernmental organization founded in 1989 on the initiative of the G7 to develop policies to combat money laundering. In 2001 the purpose expanded to act on terrorism financing. It monitors countries' progress in implementing the FATF Recommendations by 'peer reviews' ('mutual evaluations') of member countries. The FATF Secretariat is housed at the headquarters of the OECD in Paris.

91. (d) '**Pradhan Mantri Gramin Digital Saksharta Abhiyan' (PMGDISHA**) to make 6 crore rural households digitally literate by March 2019. PMGDISHA is expected to be one of the largest digital literacy programmes in the world. This approval comes in line with the announcement made by Union Budget of 2016-17.

92. (b) The KeibulLamjao National Park (Kei- Tiger, Bul - vast, Lamjao-Land) is a national park in the Bishnupur district of the state of Manipur in India. It is 40 km2 (15.4 sq mi) in area, the only floating park in the world, located in North East India, and an integral part of Loktak Lake. The national park is characterized by many floating decomposed plant materials locally called phumdis. To preserve the natural refuge of the endangered Manipur Eld's deer or brow-antlered deer (Cervuseldieldi), or sangai also called the

dancing deer, listed as an endangered species by IUCN, the park which was initially declared to be a sanctuary in 1966, was subsequently declared to be a national park in 1977 through a gazette notification.

93. (d) The festival is celebrated from 10th day of bright fortnight up to full moon day of Falguna. Deities from different villages and different SahiBhagabatGhara come to the MelanaPadia (field) by Dola, a specially designed temple like structure made of wood. The get together is celebrated in different villages/cities across Odisha. Odissi and gotipua dancers also perform in front of the Bimana/Dola.
94. (b) Self-explanatory
95. **(d) PSLV**
    The PSLV is one of world's most reliable launch vehicles consisting of four stages. It has been in service for over twenty years and has launched historic missions like Chandrayaan- 1, Mars Orbiter Mission, IRNSS etc. It can take up to 1,750 kg of payload to SunSynchronous Polar Orbits of 600 km altitude and payload of 1,425 kg to Geosynchronous and Geostationary orbits.
96. (d) In this process either **silver iodide**, potassium iodide or dry ice (solid carbon dioxide) is dumped onto the clouds causing rainfall. This method can be used to cause significant amount of rainfall over a specified area especially in location where rain is badly needed.
97. (a) The Pong Dam, also known as the Beas Dam, is an earth-fill embankment dam on the Beas River in the state of Himachal Pradesh, India, just upstream of Talwara. The purpose of the dam is water storage for irrigation and hydroelectric power generation. As the second phase of the Beas Project, construction on the dam began in 1961 and was completed in 1974. At the time of its completion, the Pong Dam was the tallest of its type in India. The lake created by the dam, Maharana Pratap Sagar, became a renowned bird sanctuary.
98. **(b) Types of ATM:**

- Bank ATM- owned and operated by the respective bank.
- Brown Label ATM- banks outsource the ATM operations to a third party. They have logo of the bank.
- White Label ATM- owned by nonbank entities. Eg- Muthoot Finance ATM, TATA Indicash, etc. There is no bank logo.

99. (c) Ministry of Mines has developed and launched "TAMRA", a web portal and mobile application, to streamline the process of various statutory clearances required for mining operations.TAMRA stands for Transparency, Auction Monitoring and Resource Augementation
100. (a) Foreign Direct Investment (FDI) flows into India in two ways, the automatic route and through government approval. FIPB offers a single window clearance mechanism for FDI applications in sectors under the approval route. The board has handled investment proposals worth up to ₹5,000 crore. FIPB is located in the Department of Economic Affairs, Ministry of Finance and the Finance Minister is in charge of the FIPB.