Q.1) Which of the following is NOT a type of drainage pattern?

A. Dendritic

B. Radial

C. Trellis

D. Perennial

Q.1) Solution (d)

Explanation:

- A dendritic drainage pattern looks like the branches of a tree, with small tributaries flowing into larger rivers.
- A radial drainage pattern flows outwards from a central point, like spokes on a wheel.
- A trellis drainage pattern has smaller tributaries flowing into larger parallel streams.
- A rectangular drainage pattern has streams that flow in a straight line, meeting at right angles.
- "Perennial" refers to the longevity of a stream, meaning it flows year-round. However, it is not a type of drainage pattern. **Hence Option d is correct answer**

Q.2) With reference to the Indian drainage system, consider the following statements:

1. More than 75% of the discharge of Indian rivers is oriented towards the Bay of Bengal.
2. A basin with catchment area of less than 2000 sq.km. is classified as a medium river basin.

Which of the above statements is/are correct?

a) Only 1
b) Only 2
c) Both 1 and 2
d) Neither 1 nor 2

Q.2) Solution (a)

Explanation:

- On the basis of discharge of water (orientations to the sea), it may be grouped into: (i) the Arabian Sea drainage; and (ii) the Bay of Bengal drainage.
  They are separated from each other through the Delhi ridge, the Aravalli and the Sahyadri
    - Nearly **77% of the drainage area** consisting of the Ganga, the Brahmaputra, the Mahanadi, the Krishna, etc. is **oriented towards the Bay of Bengal** while 23 per cent comprising the Indus, the Narmada, the Tapi, the Mahi and the Periyar systems discharge their waters in the Arabian Sea. Thus, **statement 1 is correct**.
- On the basis of the size of the watershed, the drainage basins of India are grouped into three categories:
    - Major river basins with more than 20,000 sq. km of catchment area. It includes 14 drainage basins such as the Ganga, the Brahmaputra, the Krishna, the Tapi, the Narmada, the Mahi, the Pennar, the Sabarmati, the Barak, etc.
    - Medium river basins with catchment area between 2,000-20,000 sq. km incorporating 44 river basins such as the Kalindi, the Periyar, the Meghna, etc.
    - **River basins with catchment area of less than 2,000 sq. km are termed as Minor River basins**. Thus, **statement 2 is incorrect**.

Q.3) With reference to the course of a river, consider the following statements:

1. Knick point is the point where the old and rejuvenated profile of a river meets.
2. A river gets rejuvenated when there is a subsidence of land or a rise in sea level.

Which of the statements given above is/are correct?

a) 1 only
b) 2 only
c) Both 1 and 2
d) Neither 1 nor 2

Q.3) Solution (a)

Explanation:

- **River Rejuvenation:**
  A knickpoint is a location on a river where there is a sharp change in the river's slope or gradient. It often marks the boundary between an upper reach with a steep gradient and a lower reach with a gentler gradient. The knickpoint represents a change in the river's

erosion capability, and it is the point where the old, steep profile of the river meets the new, gentler profile. **Hence statement 1 is correct.**

- A river gets rejuvenated when there is an uplift of land or a drop in sea level. This uplift or drop exposes the river to new rock layers that are more easily eroded, leading to a change in the river's profile and the creation of a knickpoint. A drop in sea level can also cause a river to cut deeper into its channel and create a knickpoint. **Hence statement 2 is incorrect.**

Q.4) Consider the following statements with respect to difference between meanders over plains and Incised meanders:

1. Incised meanders are a feature of a river in its youth stage.
2. Incised meanders are formed due to vertical erosion, while meanders over flood and delta plains are because of lateral erosion.
3. Meanders, whether over plains or incised, lead to frequent shift of course of river.

Which of the above statements is/are correct?

a) 1 and 3 only
b) 2 and 3 only
c) 1 and 2 only
d) 1, 2 and 3

Q.4) Solution (c)

Explanation:

- **Meander** is not a landform but is only a type of channel pattern. It is usually found in the **mature or old phase** of the course of rivers.
- When the gradient of the channel becomes extremely low i.e., while flowing **on plains**, **water flows leisurely and starts working laterally**. Normally, in **meanders** of large rivers, there is active deposition along the concave bank and undercutting along the convex bank.
- But very deep and wide meanders can also be found cut in hard rocks. Such meanders are called incised or entrenched meanders. They are formed as a result of vertical erosion of river bed. Thus, **statement 2 is correct**.
- **Incised meanders are present at the youth stage.** It leads to formation of gorges and canyons in hard rocky areas over time. Thus, **statement 1 is correct.**
- In India, Jhelum River shows presence of incised meanders.

- Over the plains, rivers display a strong meandering tendency and shift their courses frequently but the incised meanders cut vertically and hence maintain their course to a large extent. **Statement 3 is incorrect.**

Q.5) Which of the following statements are correct about an antecedent river system?

1. Antecedent rivers flow across uplifted land masses without being diverted by the rising terrain.
2. Antecedent rivers have a alluvial fans in their mature stage.
3. Antecedent rivers originate from underground springs.
4. Antecedent rivers have steep gradients and narrow valleys.

Select the correct answer from the codes given below:

a) Only 1 statement is correct
b) Only 2 statements are correct
c) Only 3 statements are correct
d) All Four Statements are correct

Q.5) Solution (b)

Explanation:

- Antecedent rivers are rivers that existed before the present topography of a region was formed. As a result, they flow across uplifted land masses without being diverted or deflected by the rising terrain. They follow the original slope of the landform over which they flow. **Statement 1 is correct.**
- Antecedent rivers do not necessarily have alluvial fans in their mature stage. Alluvial fans are formed at the base of a mountain range where a river emerges from a steep canyon or gorge onto a flatter plain. Antecedent rivers can have any drainage pattern depending on the topography and the stage of the river. **Statement 2 is incorrect.**
- Antecedent rivers do not necessarily originate from underground springs. They can originate from any source, just like any other river. **Statement 3 is incorrect.**
- Antecedent rivers have features of youthful rivers because they retain their original course and characteristics even as the landscape around them changes. They often have steep gradients, high erosive power, and narrow valleys. Example: The Sindhu, Satluj, Arun Kosi and Brahmaputra are some of the antecedent rivers. **Statement 4 is correct.**

Q.6) Match the following pairs correctly:

Sr.no.	Drainage pattern	Characteristic
1.	Dendritic	Tree-branch like flow pattern found in plains
2.	Radial	The river discharges all of its water into a lake or depression.
3.	Trellis	The tributaries initially flow parallelly and later join at right angles.

Select the correct answer from the codes given below:

a) Only 1 pair is correctly matched
b) Only 2 pairs are correctly matched
c) All 3 pairs are correctly matched
d) None of the pairs are correctly matched.

Q.6) Solution (b)

Explanation:

- The flow of water through well-defined channels is known as 'drainage' and the network of such channels is called a 'drainage system'. The drainage pattern of an area is the outcome of the geological time period, nature and structure of rocks, topography, slope, amount of water flowing and the periodicity of the flow.
- Types of Drainage Patterns:
  - **I. Dendritic Drainage Pattern:**
    - The drainage pattern resembling the **branches of a tree** is known as "dendritic"
    - E.g. The rivers of the **northern plains**; Indus, Ganga and Brahmaputra. So, **Pair 1 is correctly matched.**
  - **II. Trellis Drainage Pattern:**
    - Such a pattern is formed when the **primary tributaries of main rivers flow parallel** to each other and **secondary tributaries join them at right angles.**
    - E.g. The rivers in the upper part of the Himalayan region; Indus and Brahmaputra. **So, Pair 3 is correct.**
  - **III. Rectangular Drainage Pattern:**
    - The tributary streams make sharp bends and enter the main stream at high angles.
    - E.g. Streams found in the Vindhya mountain range
  - **IV. Radial Drainage Pattern:**

- When the rivers originate from a hill and flow in all directions, the drainage pattern is known as 'radial'.
- E.g. The rivers originating from the Amarkantak range; Narmada and Son (tributary of Ganga). So, **Pair 2 is incorrect.**

V. Centripetal Drainage Pattern:

- When the rivers discharge their waters from all directions in a lake or depression, the pattern is known as 'centripetal'.
- E.g. Loktak Lake, Manipur

Q.7) Which of the following rivers are antecedent rivers?

1. Indus
2. Ganga
3. Godavari
4. Subansiri
5. Narmada

Select the correct answer from the codes given below:

a) Only 1, 2, 4 and 5
b) Only 1 and 4
c) Only 1, 2 and 4
d) All of them

Q.7) Solution (c)

Explanation:

- The Rivers that existed before the upheaval of the Himalayas and cut their courses southward by making gorges in the mountains are known as the antecedent rivers.
- **The Indus, Satluj, Ganga, Sarju (Kali), Arun (a tributary of Kosi), Tista and Brahmaputra are some of the important antecedent rivers, originating from beyond the Greater Himalayas.**
- The **Subansiri** which has its origin in Tibet, is an also **antecedent river.**
- **Godavari** is a **consequent river** i.e. it originated after the geological strata over which it flows.
- **Narmada** river flows in a rift valley and is **not an antecedent river.**
- **Hence Option c is correct**

Q. 8) With reference to a particular river in India, consider the following statements:

1. It is a west-flowing river.
2. It originates in the Vindhyas and drains into the Gulf of Khambhat
3. It crosses the Tropic of Cancer twice.

Which of the following rivers has been described in the statements given above?

a) Tapi
b) Narmada
c) Sabarmati
d) Mahi

Q.8) Solution (d)

Explanation:

- Mahi is one of the **major inter-state west flowing rivers** of India.
- The Mahi basin extends over states of Madhya Pradesh, Rajasthan and Gujarat.
- It is bounded by Aravalli hills on the north and the north-west, by Malwa Plateau on the east, by the Vindhyas on the south and by the Gulf of Khambhat on the west.
- **Mahi River is the only river in India that cuts the Tropic of Cancer twice**, first in Madhya Pradesh from where it flows towards Rajasthan and enters Gujarat.
- It **originates from the northern slopes of Vindhyas** in Dhar district of Madhya Pradesh and **drains into the Arabian Sea through the Gulf of Khambhat.**
- Hydro Power stations are located in Mahi Bajaj Sagar dam and at Kadana Dam.
- Vadodara is the important urban centre in the basin.

Q. 9) Consider the following rivers:

1. Brahmaputra
2. Cauvery
3. Mahanadi

Arrange the above rivers in the increasing order of catchment area (in India). Select the correct answer from the code given below:

a) 1-2-3
b) 3-2-1
c) 2-1-3
d) 2-3-1

Q.9) Solution (d)

Explanation:

- The correct increasing order of catchment areas of some major rivers in India is as follows: **Cauvery** < Narmada < **Mahanadi** < **Brahmaputra** < Krishna < Godavari < Indus < Ganga

Sl. No	Basin Code	Basin Name	Area(sq.km)
1	1	Indus (Up to border) Basin	453931.87
2	2a	Ganga Basin	808334.44
3	2b	Brahmaputra Basin	186421.6
4	2c	Barak and others Basin	45622.41
5	3	Godavari Basin	302063.93
6	4	Krishna Basin	254743.31
7	5	Cauvery Basin	85624.44
8	6	Subarnarekha Basin	25792.16
9	7	Brahmani and Baitarni Basin	51893.68
10	8	Mahanadi Basin	139659.15
11	9	Pennar Basin	54243.43
12	10	Mahi Basin	38336.8
13	11	Sabarmati Basin	30678.59
14	12	Narmada Basin	92670.51
15	13	Tapi Basin	63922.91

Q.10) Arrange the following tributaries of the river Yamuna from north to south according to the points where they join the river Yamuna:

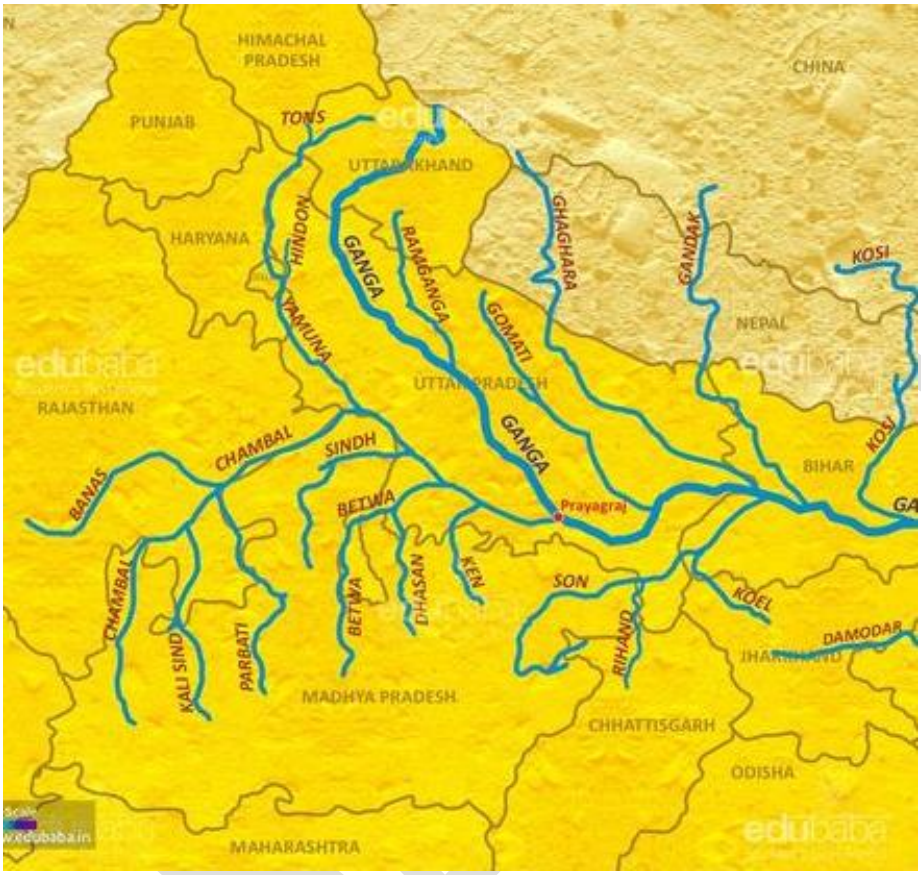
1. Tons
2. Chambal
3. Hindon
4. Ken

Select the correct answer using the code given below.

a) 1-3-2-4
b) 4-3-2-1
c) 3-1-4-2
d) 1-2-3-4

Q.10) Solution (a)

Explanation:



- **Tons River**: The Tons is the longest tributary of the Yamuna River and its flows through Garhwal, Uttarakhand. The river originates at an elevation of 3900 m and joins the Yamuna below Kalsi near Dehradun, Uttarakhand. It is one of the most major perennial Indian Himalayan rivers.
- **Giri River**: The river Giri is an important tributary of the Yamuna River. It is the main source of water in the South-Eastern Himachal Pradesh.
- **Hindon River**: Hindon River is an important tributary of Yamuna River. It has Ganga on the left and Yamuna on the right. Hindon originates from upper Shiwalik (Lower Himalayas). It is a purely rain fed river. This river has a total run of about 400 km.
- **Betwa River**: The Betwa River is a tributary of Yamuna River. The Betwa river originates in the Bhopal District in Madhya Pradesh. After traversing a distance of 590 km, the river joins the Yamuna River near Hamirpur. The basin is saucer shaped with sandstone hills around the perimeter. The Halali and Dhasan River are the important tributaries of the Betwa River.
- **Ken River**: Ken is an inter-state river, flowing through the state of Madhya Pradesh and Uttar Pradesh. The river originates near the village Ahirgawab in Jabalpur District of

Madhya Pradesh and joins the Yamuna River, near Chilla village of U.P. The important tributaries of the Ken River are Sonar, Bearma, Kopra, Bewas, etc, among others. The longest tributary is Sonar.

- **River Chambal:** The Chambal River is the largest of the rivers flowing through Rajasthan state. River Chambal, the biggest tributary of Yamuna rises in Vindhyan range near Mhow, Madhya Pradesh. Chambal basin is bound on north by the ridge separating it from Luni and Yamuna basins, on the south by Vindhyan range and on the west by Aravali range, on east lies the ridge separating it from Kunwari and Sind rivers of Yamuna basin. River Chambal forms a common boundary between Madhya Pradesh and Rajasthan.

Q. 11) Wainganga and Pranhita are tributaries of:

a) Godavari
b) Krishna
c) Narmada
d) Tapi

Q.11) Solution (a)

Explanation:

- The principal tributaries of the Godavari River are the Pravara, the Purna, the Manjra, the Penganga, the Wardha, the Wainganga, the Pranhita (combined flow of Wainganga, Penganga, Wardha), the Indravati and the Sabri.

Q.12) Which of the following rivers are the tributaries of the Brahmaputra River?

1. Subansiri
2. Manas
3. Teesta
4. Barak

Select the correct answer using the code given below.

a) 1 and 2 only
b) 3 and 4 only
c) 1, 2 and 3 only
d) 1, 2, 3 and 4

Q.12) Solution (c)

Explanation:

- The Brahmaputra originates in the Chemayungdung glacier of the Kailash range near the Mansarovar lake. From here, it traverses eastward in a dry and flat region of southern Tibet, where it is known as the Tsangpo, which means 'the purifier.' The Rango Tsangpo is the major right-bank tributary of this river in Tibet.
- It emerges as a turbulent and dynamic river after carving out a deep gorge in the Central Himalayas near Namcha Barwa. The river emerges from the foothills under the name of Siang or Dihang. It enters India west of Sadiya town in Arunachal Pradesh. Flowing southwest, it receives its main left bank tributaries, viz., **Dibang** or Sikang and **Lohit;** thereafter, it is known as the Brahmaputra.
- The Brahmaputra receives numerous tributaries in the Assam valley. Its major left bank tributaries are the **Burhi Dihing** and **Dhansari** (South) whereas the important right bank tributaries are the **Subansiri, Kameng, Manas, and Sankosh**.
- The **Subansiri** which has its origin in Tibet is an antecedent river. The Brahmaputra enters Bangladesh near Dhubri and flows southward.
- **Teesta river:** Teesta River is a major right bank tributary of the Brahmaputra (known as Jamuna in Bangladesh), flowing through India and Bangladesh. It originates in the Himalayas in Sikkim and flows to the south through West Bengal before entering Bangladesh. The river joins the Brahmaputra in Bangladesh before it flows into the Bay of Bengal after meeting with the Ganges and the Meghna.
- **Hence, options 1, 2 and 3 are correct.**
- **Barak river**: Barak rises in the Manipur hills and enters the plains near Lakhipur, Assam. The river enters Bangladesh as Surma and Kushiyara. Later, the river is called the Meghna and receives the combined flow of the Ganga and Brahmaputra. The Barak sub-basin drains areas in India, Bangladesh and Burma. It is bound on the north by the Barail range separating it from the Brahmaputra sub-basin, on the east by the Lushai hills and on the south and west by Bangladesh. Hence, **option 4 is not correct**.

Q.13) With reference to the Monsoon winds of the Arabian Sea, consider the following statements:

1. Arabian Sea branch of the monsoon is much powerful than the Bay of Bengal branch.
2. These winds cause more rainfall on the eastern side of the Western Ghats than on the western side.
3. The rainfall by the Arabian Sea stream is characterized by a steady decline as we move from east to west.

Select the correct answer from the codes given below:

a) Only 1 statement is correct
b) Only 2 statements are correct
c) All 3 statements are correct.
d) None of the statements are correct.

Q.13) Solution (a)

Explanation:

- Monsoon winds beyond south Kerala progress in the form of two branches viz. the Arabian Sea branch and the Bay of Bengal branch.
- **Statement 1 is correct: Arabian Sea branch of the monsoon is much powerful than the Bay of Bengal branch** because:
    - The Arabian Sea is larger than the Bay of Bengal, and
    - The entire Arabian Sea current advances towards India, whereas only a part of the Bay of Bengal current enters India, the remainder proceeding to Myanmar, Thailand and Malaysia.
- The Arabian Sea branch of the southwest monsoons is divided into three distinct streams on arriving in the mainland of India.
    - The first stream strikes the west coast of India and causes heavy rainfall over western side of Western Ghats. Rainfall is drastically reduced to about 30-50 cm on the western side (leeward) side of the Ghats and it is seen as a narrow belt of marked aridity on the immediate leeward side of the Western Ghats. **Hence, statement 2 is incorrect.**
    - But once it is passed, the air starts rising again and the amount of rainfall increases further east.
    - The second stream enters Narmada—Tapi troughs (narrow rift valley) and reaches central India. It does not cause much rain due to the absence of major orographic obstacle across the rift. Some parts of central India receive rainfall from this stream (Ex: Nagpur).
    - The third stream moves parallel to the Aravali Range without causing much rainfall. However, some orographic effect occurs on the south-eastern edge of the Aravali Range leading to rainfall.
- The Bay of Bengal Branch of the southwest monsoon is divided into two distinct streams:
    - The first stream crosses the Ganga-Brahmaputra delta and reaches Meghalaya causing intense rainfall.

    - The second stream of the Bay of Bengal branch moves along Himalayan foothills as they are deflected to the west by the Himalaya and brings widespread rainfall to Ganga plain.
- **Statement 3 is incorrect: The rainfall by the Bay of Bengal stream (not the Arabian Sea Stream) of monsoon is characterized by a steady decline as we move from east to west in the plain** because:
    - The Bay of Bengal branch moves towards northeast and returns westwards covering the northern plains.
    - While they move towards west their moisture contains tends to reduce with subsequent rains. Hence the rainfall decreases from east to west in northern India.
- The Tamil Nadu coast remains relatively dry during the south-west monsoon period because of rain shadow effect of the Arabian Sea current and Bay of Bengal current which flows parallel to the coast.

Q.14) Consider the following statements with respect to Tibetan High:

1. Tibetan High is a warm anticyclone located in the upper troposphere during the monsoon period.
2. Greater the Tibetan High, stronger will be the monsoons in India.

Which of the statements given above is/are correct?

a) Only 1
b) Only 2
c) Both 1 and 2
d) Neither 1 nor 2

Q.14) Solution (c)

Explanation:

- Tibetan High is a warm anticyclone located over Tibetan Plateau in the middle/upper troposphere during the monsoon period. Hence**, statement 1 is correct.**
- The outflow of winds from this Tibetan High concentrate into jet stream. This becomes the Tropical Easterly Jetstream. This jet stream runs from the east coast of Vietnam to the west coast of Africa.
- This Jetstream then creates a low-pressure region in the upper troposphere over the Horn of Africa region. This leads to diversion of the Monsoon winds coming towards the Horn of Africa.

- Thus, in the upper troposphere,
  Greater the Tibetan High → Greater will be the low pressure over Horn of Africa→ Stronger will be the deflection of Monsoon winds → **Stronger will be the monsoons. Thus, Statement 2 is correct.**

Q.15) Consider the following statements regarding Pacific Decadal Oscillation (PDO):

1. Both El Niño and Positive Phase of PDO are similar in effect.
2. A positive PDO shows drought conditions in the eastern Pacific and good rainfall in the western Pacific.

Which of the statements given above is/are correct?

a) Only 1
b) Only 2
c) Both 1 and 2
d) Neither 1 nor 2

Q.15) Solution (a)

Explanation:

- The Pacific Decadal Oscillation (PDO) is often described as a long-lived El Niño-like pattern of Pacific climate variability. It is observed in the Northern Pacific Ocean.
- Its fluctuation is observed approximately every 20 to 30 years.
- PDO has two phases:
  - **Positive phase**: Warm water accumulates near Eastern Pacific. This causes **rainfall in the western coast of North America i.e., eastern Pacific**. Thus, **Statement 2 is incorrect.**
    - But this affects the Indian Monsoons negatively.
  - **Negative phase**: Warm water accumulates near the middle and Western Pacific Ocean. This
- **Statement 1 is correct:** During the **"positive", phase of PDO**, **the East Pacific becomes warmer. It is similar to conditions caused by El Nino.**
- PDO alone is not of much impact; but it can intensify or diminish the impacts of ENSO according to its phase.
  - If both ENSO and the PDO are in the same phase, it magnifies the El Niño/La Nina impacts.

- If ENSO and the PDO are out of phase, they may offset one another, preventing ENSO from impacting the climate.

Q.16) Consider the following statements with reference to Madden Julian Oscillation (MJO):

1. It is a band of low-pressure systems moving from West to East.
2. It is a temporary Jet Stream observed during monsoons in the upper troposphere.
3. If MJO is over the Indian Ocean during Monsoons, it positively impacts the monsoon rainfall in India.

Which of the statements given above are correct?

a) 1 and 2 only
b) 2 and 3 only
c) 1 and 3 only
d) 1, 2 and 3

Q.16) Solution (c)

Explanation:

- The Madden Julian Oscillation (MJO) is one of the most important atmosphere-ocean coupled phenomena in the tropics, which has a profound influence on the Indian Summer Monsoon
- **MJO** is a massive weather event consisting of **low-pressure systems** coupled with atmospheric circulation, **moving slowly eastward** over the Indian and Pacific Oceans. Thus, **statement 1 is correct.**
- Each cycle lasts approximately **30–60 days.** It is also known as the 30–60-day oscillation or intra-seasonal oscillation (ISO).
- The MJO involves variations in **wind, sea surface temperature (SST), cloudiness, and rainfall**.
- As it moves, strong MJO activity often splits the planet into two — one in which the MJO is in the active phase and brings rainfall, and the other in which it suppresses rainfall.
    - In the active phase, MJO results in more than average rainfall for that time of the year, while in the suppressed phase, the area receives less than average rainfall. Thus, **Statement 3 is correct**.
    - An active phase is generally followed by a weak or suppressed phase, in which there is little MJO activity.
    - Because the MJO cycle lasts only 30-60 days, there can be multiple MJO events in a season**. Three active MJO periods are witnessed every year on average**.
- The effect of the MJO is witnessed mainly in the tropical region and India falls in this band.

- It is a **global band of low-pressure systems moving in the lower troposphere**. It has nothing to do with jet streams. Thus, **Statement 2 is incorrect.**

Q.17) The Tamil Nadu coast receives rainfall during the northeast monsoon season because:

1. Westerly Jet stream shifts to the north.
2. Bay of Bengal is warm and presence of depressions and cyclones create a low-pressure system.

Which of the above statements is/are correct?

a) Only 1
b) Only 2
c) Both 1 and 2
d) Neither 1 nor 2

Q.17) Solution (b)

Explanation:

- The weather in the **retreating monsoon** is **dry in north India** but it is associated with **rain in the eastern part of the Peninsula**. It is also called the winter monsoon.
- Northeast monsoon is important for Tamil Nadu, Puducherry, Karaikal, Yanam, coastal Andhra Pradesh, Kerala, north interior Karnataka, Mahe and Lakshadweep. Here, October and November are the rainiest months of the year. Some South Asian countries such as Maldives, Sri Lanka and Myanmar, too, record rainfall during October to December.
- The **Westerly Jet stream shifts to the South** bringing in Western disturbances in North India. The ITCZ also shifts southwards. The wind starts blowing from the North-East direction towards the Indian Ocean. Thus, **statement 1 is incorrect.**
- Two major reasons are cited for the Northeast monsoons:
  i. After the complete withdrawal of the Southwest monsoon from the country takes place by mid-October, the **wind pattern** rapidly changes from the **south-westerly to the north-easterly direction**. Once the North-easterly winds cross the Himalayas, they enter the Bay of Bengal. Since these winds **blow from sea to land, they pick up moisture from the Bay of Bengal**. This is interrupted by the Eastern Ghats and thus there is rainfall in the Coromandel coast.
  ii. The North-easterly winds are also accompanied by **depressions and cyclones** and create a low-pressure system. The widespread rain in this season is associated with the passage of **cyclonic depressions which originate over the Bay of Bengal** and

manage to cross the eastern coast of the southern Peninsula. These tropical cyclones are very destructive. **A bulk of the rainfall of the Coromandel coast is derived from these depressions and cyclones.** Such cyclonic storms are less frequent in the Arabian Sea. So, **Statement 2 is correct.**

Q.18) Which of the following statements is correct regarding the season of retreating monsoon in India?

a) The weather in the retreating monsoon is dry in the eastern part of the Peninsula.
b) Monsoon withdrawal is experienced first in Western India.
c) The widespread rain in this season is associated with the passage of cyclonic depressions which originate over the Arabian Sea.
d) It is marked by clear skies and fall in temperature.

Q.18) Solution (b)

Explanation:

- The months of October and November are known for retreating monsoons. By the end of September, the southwest monsoon becomes weak as the low-pressure trough of the Ganga plain starts moving southward in response to the southward march of the sun.
- The monsoon retreats from the western Rajasthan by the first week of September. It withdraws from Rajasthan, Gujarat, Western Ganga plain and the Central Highlands by the end of the month.
- By the beginning of October, the low pressure covers northern parts of the Bay of Bengal and by early November, it moves over Karnataka and Tamil Nadu. By the middle of December, the centre of low pressure is completely removed from the Peninsula.
- This means that **the withdrawal of monsoons is first experienced in Western India**, then over Central India followed by Eastern India and finally over Southern India. Thus, **statement b is correct.**
- The retreating southwest monsoon season is marked by clear skies and rise in temperature. Hence, **statement d is incorrect.**
- The land is still moist. Owing to the conditions of high temperature and humidity, the weather becomes rather oppressive. This is commonly known as the 'October heat'.
- In the second half of October, the mercury begins to fall rapidly, particularly in northern India. The weather in the retreating monsoon is dry in north India but it is associated with rain in the eastern part of the Peninsula. Here, October and November are the rainiest months of the year. Hence, **statement a is incorrect.**

- The widespread rain in this season is associated with the passage of cyclonic depressions which originate over the Andaman Sea and manage to cross the eastern coast of the southern Peninsula. Hence, **statement c is incorrect.**
- These tropical cyclones are very destructive. The thickly populated deltas of the Godavari, Krishna and Kaveri are their preferred targets. Every year cyclones bring disaster here. A few cyclonic storms also strike the coast of West Bengal, Bangladesh and Myanmar. A bulk of the rainfall of the Coromandel coast is derived from these depressions and cyclones. Such cyclonic storms are less frequent in the Arabian Sea.

Q.19) With reference to monsoon depressions in India, consider the following statements:

1. Monsoon depressions generally do not intensify into cyclonic storms.
2. These can originate over the land as well.

Which of the statements given above is/are correct?

a) Only 1
b) Only 2
c) Both 1 and 2
d) Neither 1 nor 2

Q.19) Solution (c)

Explanation:

- The **depressions which form during the monsoon season** are called the monsoon depressions. These can be of:
  - Bay of Bengal origin,
  - Land origin (Hence, **statement 2 is correct**)
  - Arabian Sea origin.
- Monsoon depression is a cold core system (central temperature colder than the environment) over surface and in the lower levels and a warm core in upper levels (central temperature warmer than the environment).
- The monsoon depressions tilt southwards with height and if the monsoon depression is moving westward, the heavy rainfall is mainly concentrated in the SW quadrant.
- **Due to the high vertical wind shear present during the Southwest monsoon season, monsoon depressions generally do not intensify into cyclonic storms**. The depressions forming in pre-monsoon season and post monsoon season intensifies into cyclonic storm. Hence, **statement 1 is correct.**

Q. 20) Which of the following statements is correct with reference to the Western Disturbances?

a) Their arrival in India is characterized by a sudden rise in the prevailing night temperature.
b) They are anti-cyclonic systems originating over the eastern Mediterranean Sea.
c) It sustains the flow of water in the Himalayan rivers during the winter months.
d) They are steered in India by Tropical Easterly Jet Streams.

Q.20) Solution (a)

Explanation:

- **Western Disturbances:**
  - They are **shallow cyclonic depressions** (weak temperate cyclones) originating over the eastern Mediterranean Sea and travelling eastwards across West Asia, Iran, Afghanistan and Pakistan before they reach the north-western parts of India. Hence **option (b) is incorrect.**
  - **They are steered in India by Westerly Jet Streams. Hence option (d) is incorrect.**
  - On their way, the moisture content gets augmented from the Caspian Sea in the north and the Persian Gulf in the south.
  - Although the amount of rainfall caused by them is meagre, it is highly beneficial for rabi crops. **It sustains the flow of water in the Himalayan rivers during the summer months. Hence option (c) is incorrect.**
  - **An increase in the prevailing night temperature** generally indicates an advance in the arrival of these cyclones' disturbances. Hence **option (a) is correct.**

Q.21) Consider the following statements about the Red Mud

1. Red mud is an industrial waste generated during the processing of bauxite into alumina using the Bayer process.
2. It can be used to build radiation shielding structures in diagnostic X-rays, CT scanner rooms and Cath labs.
3. It is low cost, non-toxic and has very less chances of leaching the surrounding environment.

Choose the correct statements:

a) 1, 2 and 3

b) 1 and 3
c) 2 and 3
d) 1 and 2

Q.21) Solution (d)

Explanation:

- Red mud, now more frequently termed **bauxite residue**, is an industrial waste generated during the processing of **bauxite into alumina using the Bayer process**. It is composed of various oxide compounds, including the iron oxides which give its red colour. **Hence statement 1 is correct**.
- Red mud can be turned into **X-ray shielding tiles** in a green and economically viable manner through a ceramic route by adding a certain weight percentage of high Z material and binder with it. These tiles can be used to build radiation shielding structures in diagnostic Xrays, **CT scanner rooms, Cath labs, bone mineral density**, dental Xrays, etc., instead of the toxic lead sheet to protect the public from radiation hazards. **Hence statement 2 is correct**.
- It is considered to be **toxic due to its extreme alkalinity and heavy element leaching**. Although the scientific community has patented more than 700 applications of red mud, very few of them have reached industries due to high cost, low public acceptance, environmental issues, and limited market. **Hence statement 3 is not correct.**

Source: CLICK HERE

Q.22) Consider the following statements about 'Genetic Engineering Appraisal Committee (GEAC)'

1. It is a statutory committee functioning under Ministry of Science and Technology
2. No Objection Certification from the State/UT Government is required for confined field trials related to Genetically Modified (GM) crops by GEAC
3. GEAC is chaired by an expert in the field of bio-technology nominated by the Union Government.

Choose the incorrect statements:

a) 1, 2 and 3
b) None

c) 1 and 3
d) 2 only

Q.22) Solution (c)

Explanation:

- The Genetic Engineering Appraisal Committee (GEAC) is the **statutory committee** constituted under the "Rules for the Manufacture, Use/Import/Export and Storage of Hazardous Micro Organisms/Genetically Engineered Organisms or Cells (Rules, 1989)" framed **under Environment (Protection) Act, 1986**. **Hence statement 1 is not correct.**
- For the consideration of any application related to confined field trials of Genetically Modified (GM) crops by GEAC, **NOC from the State/UT Government is required**. **Hence statement 2 is correct.**
- GEAC is **chaired by the Special Secretary/Additional Secretary of MoEF&CC** and co-chaired by a representative from the Department of Biotechnology (DBT). Presently, it has 24 members and meets every month to review the applications in the areas indicated above. **Hence statement 3 is not correct**.

Source: CLICK HERE

Q.23) Consider the following statements about 'Agni Prime missile'

1. It is a two stage ballistic missile which can be launched from land, air and sea.
2. The nuclear-capable missile has been designed and developed by the Defence Research and Development Organisation (DRDO).
3. It is guided by a ring laser gyro inertial navigation system optionally augmented by GPS/NavIC satellite guidance.

Choose the correct statements:

a) 1, 2 and 3
b) 2 and 3
c) 1 and 3
d) 1 and 2

Q.23) Solution (b)

Explanation:

- Agni-P is a **two-stage, road mobile and solid-fueled MRBM** which is transported by a truck and launched via a canister. In addition, since it is canisterised, it can be **launched from rail or road, be stored for longer periods and can be transported as per operational requirements. It cannot be launched from air. Hence statement 1 is not correct.**
- The **nuclear-capable missile** has been **designed and developed** by the Defence Research and Development Organisation (DRDO). It is manufactured by the Bharat Dynamics Limited. Hence statement 2 is correct.
- It is guided by **ring laser gyro inertial navigation system** with redundant micro inertial navigation and digital control system, Optionally augmented by GPS/NavIC satellite guidance. **Hence statement 3 is correct.**

Source: CLICK HERE

Q.24) Consider the following statements about 'Official Languages Committee'

1. It is a statutory committee constituted under the Official Language Act of 1963
2. The Act makes it obligatory for the President to issue directions in accordance with the report

Choose the incorrect statements:

a) 1 only
b) 2 only
c) Both 1 and 2
d) Neither 1 nor 2

Q.24) Solution (d)

Explanation:

- Official language committee is a **statutory committee constituted under Section 4 in the Official Language Act, 1963**. Hence statement 1 is correct.
- The Act makes it **obligatory for the President to issue directions "in accordance with the whole or any part of the report**. Hence statement 2 is correct.
- The remit of the committee is to review the progress made in the use of Hindi for the official purposes of the Union and submit a report to the President.

Source: CLICK HERE

Q.25) 'Tigray' a region which is conflict-ridden seen in news is in

a) Syria
b) Nigeria
c) Ethiopia
d) Burkina Faso

Q.25) Solution(c)

Explanation:

- The Tigray Region is **the northernmost regional state in Ethiopia**. The Tigray War is an ongoing civil war thatbegan on 3 November 2020 in the Tigray Region of Ethiopia. The war is primarily being fought by theEthiopian federal government and Eritrea on one side, and the Tigray People's Liberation Front (TPLF) on the other.

Source: CLICK HERE

Q.26) In an MBA entrance examination, 44% of the students failed in quants and 32% failed in reasoning. If 30% of the students failed in both the topics, then find the percentage of students who passed in both the topics.

a) 40%
b) 42%
c) 54%
d) 46%

Q.26) Solution (c)

Explanation:

Failed in quants, n (A) = 44

Failed in reasoning, n (B) = 32

$n(A \cup B) = n(A)+n(B)-n(A \cap B)$

➔ $44+32-30 = 46$

Failed in either one or both topics are 46

Percentage passed = (100−46) % = 54%

Q.27) An Astrologer has 2 parrots with him which tells the fortune of a person. Parrot 1 speaks truth in 75% of cases and Parrot 2 in 80% of cases. In what percentage of cases are they likely to contradict each other, narrating the same incident?

a) 25%
b) 30%
c) 35%
d) 40%

Q.27) Solution (c)

Explanation:

Let A = Event that Parrot 1 speaks the truth.

B = Event that Parrot 2 speaks the truth

Then P (A) = 75/100 = 3/4

P (B) = 80/100 = 4/5

P (A-lie) = 1-3/4 = 1/4

P (B-lie) = 1-4/5 = 1/5

Now

Parrot 1 and Parrot 2 contradict each other = [Parrot 1 lies and Parrot 2 true] or [Parrot 1 true and Parrot 2 lies]

= P (A)*P(B-lie) + P(A-lie)*P(B) [Please note that we are adding at the place of OR]

= (3/5*1/5) + (1/4*4/5) = 7/20

= (7/20 * 100) % = 35%

Q.28) Two numbers are less than third number by 30% and 37% respectively. How much percent is the second number less than by the first?

a) 7%
b) 9%
c) 12%
d) 10%

Q.28) Solution (d)

Explanation:

Let the third number is x

Then first number = (100-30) % of x

= 70% of x = 7x/10

Second number is (63x / 100)

Difference = 7x/10 - 63x/100 = 7x/10

So required percentage is, difference is what percent of first number

=> (7x/100 * 10/7x * 100) % = 10%

Q.29) A cocktail contains a mixture of 175 ml water and 700 ml alcohol. Gopal takes out 10% of the mixture and substitutes it by water of the same amount. The process is repeated once again. The percentage of water in the mixture is now

a) 25.4
b) 20.5
c) 30.3
d) 35.2

Q.29) Solution (d)

Explanation:

Given that a cocktail contains a mixture of 175 ml water and 700 ml alcohol.

It is given that 10% of the mixture is removed and it is substituted by water of the same amount and the process is repeated once again

Now we have to find the percentage of water in the mixture.

Since the mixture is removed and substituted with water, we can deal with alcohol and the second step we can find how much amount of alcohol is retained and not about how much amount of alcohol is removed

As 10% of alcohol is removed, 90% of alcohol is retained

So alcohol remaining = 700 × 90% × 90%

$\Longrightarrow 700 \times 0.9 \times 0.9 = 567$

We totally have 875 ml overall mixture and of this 567 ml is alcohol.

Remaining 875 – 567 = 308 is the amount of water.

We have to find the percentage of water in the mixture i.e. 308/875

Approximately 308 is 30% of 1000 so by this we know that 308 is more than 30%

Hence, 35.2% is the percentage of water in the given mixture.

Read the following passage and answer the item that follow. Your answer to these items should be based on the passages only

Passage 1

In the past, the few women professionals who dotted our corporate landscape suffered in silence, not willing to complain about discrimination or harassment for fear of losing their jobs. Today, there is strength in numbers and women are willing to raise issues of gender discrimination and sexual harassment publicly. Although women have greater confidence, financial independence, strong peer groups and a deeper understanding of their rights, they are still reluctant to expose issues related to sexual harassment and to take their tormentors down the legal path of justice.

There exists, unfortunately, a huge psychological challenge that women, and society as a whole, need to address. This relates to behavioural attitudes and codes of conduct in the workplace.

It was in 1997 that a women's rights group called Vishaka filed a PIL in the Supreme Court in response to a humiliating legal battle fought by a rape victim in Rajasthan, who did not get justice and was shamed and ostracised by her community instead. Consequently, the Supreme Court's Vishaka judgement laid down guidelines for employers to deal with complaints of sexual harassment/assault at the workplace, which included the formation of an independent redressal committee.

Q.30) Which of the following is true with regard to women professionals who worked in corporate offices in the past?

1. They were considered as most privileged women and special treatment was given to them.
2. They had to suffer in silence because of male dominance and fear of losing jobs.
3. They were given special perks and leave facilities.

Choose the correct code

a) 1 and 2 only
b) 1 and 3 only
c) 2 only
d) 2 and 3 only

Q.30) Solution (c)

Explanation:

Refer to, "In the past, the few women professionals who dotted our corporate landscape suffered in silence, not willing to complain about discrimination or harassment for fear or losing their jobs."

From the opening statement of the passage, it's evident that in the past women had to suffer in silence because of male dominance and fear of losing jobs.

Hence, option c is the correct answer.