



Progress is more plausibly judged by the reduction of deprivation than by the further enrichment of the opulent

- Amartya Sen



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A. GS 1 Related

Nothing here for today!!!

B. GS 2 Related

Nothing here for today!!!

C. GS 3 Related**Category: SCIENCE AND TECHNOLOGY****1. Knotty supply chains deepen global chip shortage**

Syllabus: Awareness in the fields of IT, Computers, robotics, and nano-technology and issues

Mains: The complex intricate nature of the global semiconductor supply chain and the impact of global chip shortage.

Context

Toyota Corporation apologised to its customers for the third time in two months for the delays in manufacturing due to the global chip shortage.

Details

- The Toyota Corporation had recently reduced its global production targets for the period between April and June by 1,00,000 to 7,50,000 vehicles.
- Again the Toyota Corporation due to the impact of semiconductor shortages adjusted its production plan from the numbers provided at the start of the year.
- Meanwhile, the global chip manufacturers such as AMD, Nvidia and Intel have held that the chip shortage will persist for the rest of 2022.

Background

For a detailed background on the issue refer to the following article:

[UPSC Exam Comprehensive News Analysis dated Mar 03 2022](#)

The interconnected network of semiconductor manufacturing

- Semiconductors currently play a key role in the global economy as large companies rely on them.
- Due to the increase in their demand, companies created a process to make chip sets which were made by interconnecting various parts of the world to make a single device, this is called the global supply chain.
- Semiconductor companies used this process to make a chip which was divided into front-end and back-end parts.
 - Wafer fabrication and probe are usually the front-end operations,
 - Assembly and test are back-end operations.
- These front and back-end parts were further divided into smaller units and were spread out across the globe, creating a global chip-making ecosystem.
- This ecosystem of semiconductor manufacturing is so large that each segment of semiconductor production involves about 25 countries in the direct supply chain and 23 countries in indirect functions.
- A report suggests that a semiconductor-based product could pass international borders nearly 70 times before finally reaching the consumer.
- The wafer fabrication process is the most dispersed process involving 39 countries directly and 34 in other associated processes such as photolithography, etching and cleaning.
 - While the manufacturing takes place in 12 countries, product testing and manufacturing involve 25 countries.

Just-In-Time (JIT) Technique used by car manufacturers

- The Just-In-Time (JIT) technique was developed during [World War II](#) by Japanese companies that faced shortages of resources and space.
- These companies rebuilt their units by using the available resources and space meticulously in the leanest possible way.
- Taiichi Ohno, the father of the Toyota Production System, later conceptualised JIT and the Kanban technique to create an efficient production system for automobiles.
 - Many companies and chip manufacturers used JIT to operate their supply chains efficiently.
 - JIT allows firms to take inputs from suppliers only when they are needed; this helps them to reduce inventory storage costs, reduce production cycles and free up funds for other activities.
- This key aspect of supply chains backfired due to the pandemic, and the recent geopolitical events such as the [invasion of Ukraine](#).
 - Due to the pandemic, car makers stopped procuring chips from suppliers due to low demand for new vehicles and post-pandemic when the demand is high the chip makers are down on supply as they have cut deals with other industries.

- The war in Ukraine and production shutdowns in China have increased the stress on the semiconductor supply chain.

Path ahead

- Intel CEO said that the supply and demand for semiconductor chips will balance out only by 2024.
- He further said that the **European Chips Act** (45 billion euros) and **CHIPS for America Act** (\$52 billion) are expected to incentivise chip manufacturers to establish their units in these regions which will become the key to balancing the current situation.
- These interventions by the West are expected to have equal investments by semiconductor manufacturers in the East and West by 2030, which now stands at 80% in Asia and 20% in Europe and the U.S.

Know more about the [Global Semiconductor Shortage](#).

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Along with the impact of the pandemic and the geopolitical developments in Europe, the complex and intricate nature of the semiconductor manufacturing ecosystem has resulted in an imbalance in the demand and supply of semiconductor chips.

Category: ENVIRONMENT

1. Green hydrogen: Fuel of the future?

Syllabus: Conservation, environmental pollution and degradation

Prelims: About Green Hydrogen

Mains: The need for advancing green hydrogen capabilities, advantages of Green hydrogen and the current status of India's green hydrogen capabilities.

Context

The Indian Minister of Petroleum and Natural Gas said that India will emerge as the leader in green hydrogen.

Details

- The Minister at the World Economic Forum in Davos, Switzerland said that India can take advantage of the current energy crisis in the world.
- Recently, Oil India Limited (OIL) started India's first 99.99% pure green hydrogen plant in Jorhat, Assam.

Green hydrogen

- Hydrogen is the lightest, simplest and most abundant chemical element in the universe.
- Also, hydrogen is colourless, odourless, tasteless, non-toxic and highly combustible.
- Hydrogen produced through the electricity generated without emitting greenhouse gas is called "Green hydrogen".
- Green hydrogen is produced through electrolysis using renewable sources of energy like solar, wind or hydel energy.
 - Grey hydrogen is generated through fossil fuels such as coal and gas and currently accounts for 95% of the total production in South Asia.
 - Blue hydrogen is produced using electricity generated by burning fossil fuels but with technologies that prevent the carbon released in the process from entering the atmosphere.

Reasons for developing green hydrogen capabilities for India

- India is committed to reducing its greenhouse gas emissions by 33-35% from the 2005 levels under the [Paris Agreement of 2015](#).
- India also committed to shifting from a fossil and import-dependent economy to a net-zero economy by 2070 at the [2021 Conference of Parties in Glasgow](#).
- India imports energy worth more than \$100 billion annually which dents its purse significantly.
- India has become a high carbon dioxide (CO₂) emitter constituting about 7% of the global CO₂ burden due to increased consumption of fossil fuel.
- The Indian government is undertaking various initiatives to use green hydrogen as an alternative fuel and make India the global hub of green hydrogen.
 - In this regard, the [National Hydrogen Mission](#) was launched in 2021.

Status of green hydrogen production in India

- India has started to produce green hydrogen with an aim to increase the non-fossil energy capacity to 500 gigawatts by 2030.
- In April 2022 the public sector OIL headquartered in eastern Assam's Duliajan established India's first 99.99% pure green hydrogen pilot plant with a view of making the country ready for the pilot-scale production of hydrogen and its use in various applications.
- R & D efforts are continuously undertaken to decrease the cost of production, storage and the transportation of hydrogen.

- The plant at Jorhat in Assam is powered by a 500 KW solar plant and has the capacity to generate 10 kg of hydrogen/day which can be increased to 30 kg/day.
 - A specialised blender is also set up for blending green hydrogen produced from the unit with the natural gas supplied by the Assam Gas Corporation Limited and supplying the blended gas to the Jorhat area for domestic and industrial use.
- OIL takes the help of researchers from IIT-Guwahati to monitor the impact of the blended gas on the existing facility.

Advantages of Green Hydrogen

- Green hydrogen can be stored for longer periods of time.
- The stored hydrogen can be utilized to generate electricity using fuel cells.
 - A fuel cell is a device that converts chemical energy into electricity.
 - In a fuel cell, hydrogen reacts with oxygen to generate electricity and water vapour.
- The discontinuous characteristic of renewable energy, particularly wind energy leads to grid instability and hydrogen acts as an energy storage device and increases grid stability.
- Researchers believe that the oxygen, produced as a by-product in the fuel cell (8 kg of oxygen is produced for 1 kg of hydrogen) can also be utilised in industrial and medical applications and also for enriching the environment.

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Green hydrogen is regarded as the “fuel of the future” and various initiatives undertaken by India to increase its capabilities in green hydrogen production are laudable because it helps unlock new opportunities as green hydrogen is considered an emerging market by renewable energy developers.

D. GS 4 Related

Nothing here for today!!!

E. Editorials

Category: SOCIAL JUSTICE

1. Sighting the finishing line in measles-rubella elimination

Syllabus: GS II, Social Justice, Issues relating to health

Prelims: Measles-Rubella Vaccines, Universal Immunisation drive

Mains: *Possibilities of elimination of Measles-Rubella infections from the country.*

Context: The article explains the possibility of eliminating the infectious disease of measles-rubella by 2023.

The perspective:

- There were several campaigns to spread awareness about the measles-rubella (MR) vaccination drive across the country.
- The government decided to eliminate measles and rubella within a stipulated period.
- A high level of vaccination-induced immunity formed an integral part of the basic plan to prevent viral outbreaks such as measles and rubella.
- Two doses of measles vaccines were administered to cover the immunity gaps.
- Rubella vaccines usually cover children up to the age of 15 years for epidemiological reasons.
- For the reason of convenience and high attendance of children, schools were chosen to vaccinate the children.
- It was ensured that the MR vaccines were safe from any serious adverse event following vaccination/immunisation.
- Due to the COVID-19 pandemic, the MR vaccination drive was stalled and the target year to eliminate measles-rubella was reset to 2023.

Read comprehensively about [Measles-Rubella Vaccination Campaign](#) in the linked article.

Defining MR elimination:

- It can be defined as the zero transmission of measles and rubella viruses characterised by zero clinical diseases, sustained over three years.
- Vaccination and surveillance are the two major interventions through which MR outbreaks can be prevented.
- Surveillance plays an important role in the identification of places where viral transmission is continuing. This would also better the vaccination process and stop the further spread of infections.

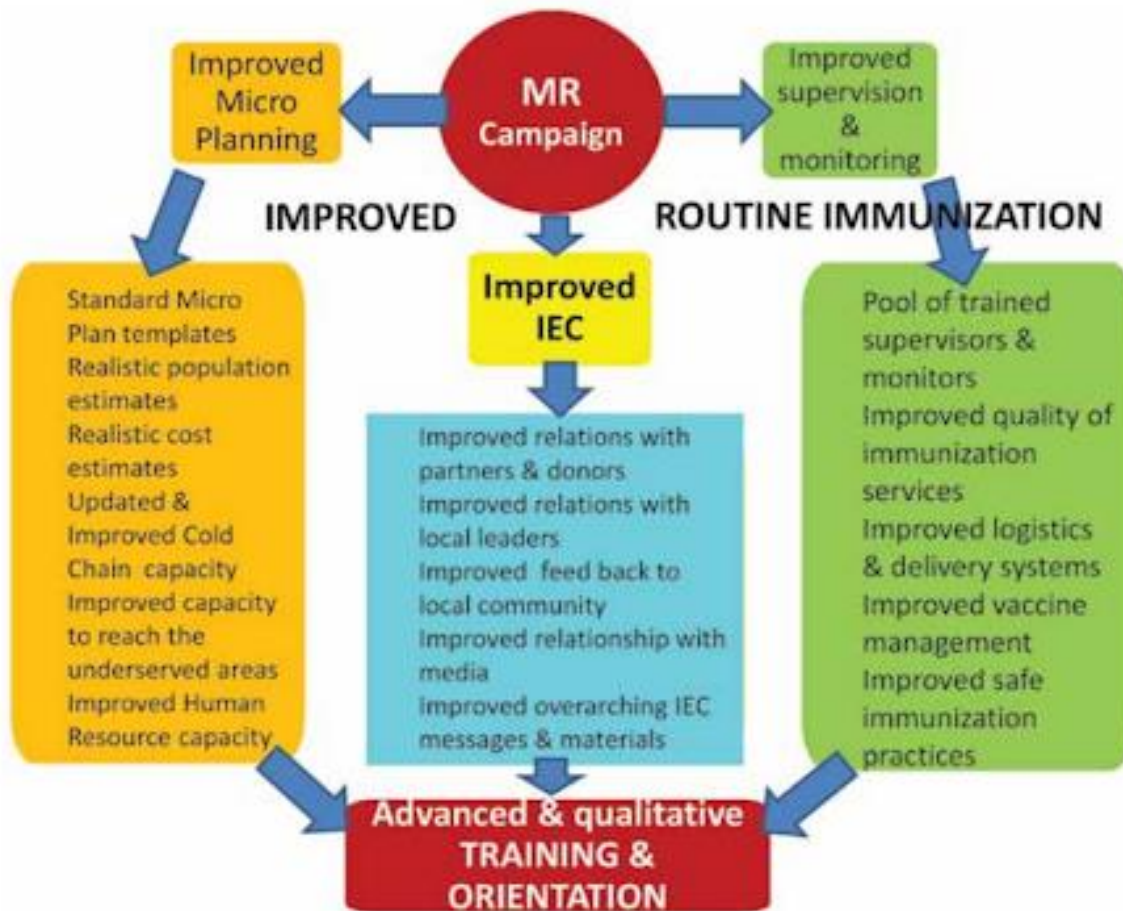


Image source: mohfw.gov.in

Way Ahead:

- The MR Vaccination drive has successfully developed the hope to eliminate infectious diseases like measles and rubella.
- This vaccine ensures to target two diseases in one shot and follows a systematic approach in training the medical practitioners and healthcare experts.
- The surveillance system is meticulously planned with a high priority towards the elimination of measles followed by the elimination of rubella.
- It has been reported that the Universal Immunisation Programme has been able to cover the majority of the children below five years of age with MR (Measles-Rubella) second dose.
- The Measles-Rubella outbreaks can be completely prevented in the country with the support of the policymakers, cooperation of parents, healthcare personnel at all levels, influencers, the media, and non-governmental organisations.

Read the details of the [Immunisation drive in India](#) in the linked article.

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The Measles-Rubella vaccination drive has been successful in ensuring immunity among children against two infectious viruses namely, measles and rubella. With the effective participation of the government, people, healthcare experts, and other stakeholders, it is possible to eradicate measles and rubella from the country.

Category: INTERNATIONAL RELATIONS

1. Security in friendship

Syllabus: GS II, International Relations, regional groupings involving India and/or affecting India's interests

Prelims: QUAD group

Mains: Significance of Quad in the maintenance of maritime security.

Context: The [Quadrilateral Security Dialogue](#) or Quad summit commenced by bringing together the leaders of important member countries at a crucial period of world politics.

An Overview:

- The invasion of Ukraine by Russia has disturbed the accepted norms on respecting territorial sovereignty, the global supply chain, increased prices of essential commodities and so on.
- The [Russia-Ukraine Conflict](#) has deviated the global attention from important issues like the pandemic and its implications, deficiencies in the healthcare infrastructure, economic recovery and so on.
- The Quad Summit which was held in Tokyo opened an avenue for an extensive engagement between India, the US, Australia and Japan to formulate a multidimensional policy to address the upcoming security challenges.
- With the primary objective to nurture a free and open Indo-Pacific, by forming compliance with the international law of the United Nations Convention on the Law of the Sea ([UNCLOS](#)), the four member countries issued a joint statement for the continuation of the cooperation.
- The discussions emphasised the freedom of navigation and overflight along with major attention to embolden the maritime security extended to the East and South China Seas.

Major Concerns:

- The key challenge surrounded the China factor and its aggressive aspirations in the Indian Ocean Region.
- Strategic challenges are imposed on rules-based international orders.
- There is a discontent between the Indian stance of being neutral about Russia and the upfront criticism of Russia by the US and Japan.

The two core messages of the dialogue:

- The Quad members will strongly oppose the coercive, provocative and unilateral actions by Beijing and avert any sort of tensions in the maritime sphere.
- There will be continuity of military coordination between the dialogue members to provide strategic depth to the mission.
- The dialogue members will leverage resources in vaccine delivery, climate action, supply chain resilience, disaster response, cyber security, infrastructure and economic cooperation.

Read more about the Quad Summit in [CNA](#) dated 25 May 2022.

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The Quadrilateral Security Dialogue is anticipated to play a pivotal role in reshaping and reforming the economic alliances with a strong regional security architecture.

F. Prelims Facts

Nothing here for today!!!

G. Tidbits

1. Learning loss will dent India's GDP: ADB

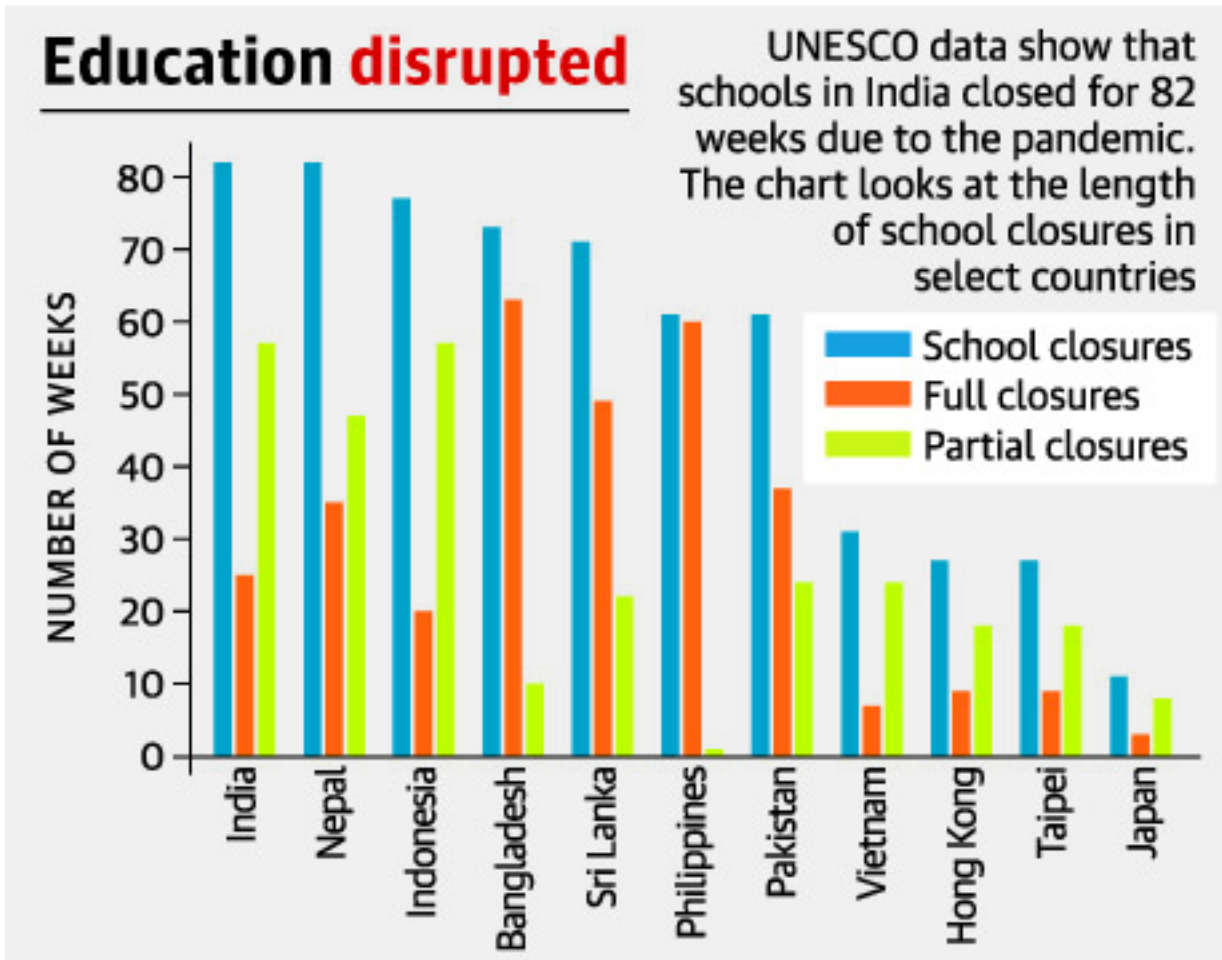


Image Source: The Hindu

- According to a paper published by [Asian Development Bank \(ADB\)](#), the Gross Domestic Product (GDP) of India will witness the highest decline in South Asia due to learning losses for the young.
- It is estimated that there would be a \$10.5 billion dent in India's GDP by 2023 which increases to about \$99 billion by 2030, resulting in a 3.19% decrease in GDP from the baseline growth trend.
- India is also among the countries with the longest school closures during the COVID-19 pandemic.
- The paper also notes that jobs for skilled labour are said to reduce by 1%, and unskilled labour by 2% in India on account of school closures.

2. NSCN (I-M) rigid as Centre pushes for solution

- The Centre and the National Socialist Council of Nagaland (Isak-Muivah) or the NSCN (I-M) signed the Framework Agreement in August 2015, which facilitated the path to a solution to the “[Naga political issue](#)”.
- The solution process reached a deadlock as NSCN (I-M) demanded a separate flag and the Yehzabo (Naga constitution), as part of the deal.
- As the government looks to solve the issue, the Centre is said to have proposed to use the “Naga national flag” as a cultural flag.
 - However, the NSCN (I-M), has held that the Naga national flag that symbolises Naga political identity is not negotiable.
- The NSCN (I-M) signed a ceasefire agreement with the government in 1997 and its rival NSCN (Khaplang) signed in 2001 and pulled out of it in March 2015.
 - Later many factions of the NSCN (Khaplang) and other outfits formed the Naga National Political Groups (NNPGs) and signed the Agreed Position with the Centre in 2017.
 - NNPGs are not demanding a separate Naga flag or a constitution.

3. India, Japan to work together to help Sri Lanka during crisis

- India and Japan have agreed to collaborate and assist Sri Lanka which is experiencing a severe economic and humanitarian crisis.
- India has already extended about \$3.5 billion in assistance since January 2022 through loan deferments and credit lines for essential imports.
 - And Japan’s initiative comes despite the scrapping of two major infrastructure projects by Sri Lanka that involved Japanese establishments.
- Further, the two countries held bilateral talks on “close cooperation” to promote measures to ensure a ‘Free and Open Indo-Pacific’, along with collaboration in sectors such as defence, clean energy, and investment.
- The two countries also shared the view to collaborate to develop the Indo-Pacific Economic Framework into an inclusive framework that benefits the region.

4. Where tortoise conservation is devotion

- As there is an emphasis in recent years on the need to protect turtles and tortoises and their disappearing habitats, a temple in Kerala’s Kasaragod has been protecting and conserving tortoise species for several centuries.
- The tortoises are protected and conserved in a naturally formed pond in the temple which has a structure (mandapam) in the middle for feeding tortoises. There is a sculpture of Kurmavatara which is considered to be the second of the ten incarnations of Lord Vishnu.

- It is believed that over 400 tortoises survive in the pond belonging to different species including those which are endangered. This has helped researchers and officials of the Forest Department to study the various species.

H. UPSC Prelims Practice Questions

Q1. With respect to the Serious Fraud Investigation Office (SFIO), which of the following statements is/are correct? (Level – Medium)

1. It was established on the recommendation of the Naresh Chandra Committee.
2. It can take up cases suo moto.
3. It falls under the jurisdiction of the Ministry of Corporate Affairs.

Options:

- a. 1 and 2 only
- b. 2 and 3 only
- c. 1 and 3 only
- d. 1, 2 and 3

Answer: c

Explanation:

- **Statement 1 is correct**, SFIO was established in January 2003, based on the recommendation of the Naresh Chandra Committee on corporate governance.
- **Statement 2 is not correct**, SFIO does not have the mandate under the provisions of the Companies Act to suo-motu investigate the matter raised.
 - SFIO starts an investigation only after receiving an order from the Union government which means that it cannot take up cases on its own.
- **Statement 3 is correct**, SFIO falls under the jurisdiction of the Ministry of Corporate Affairs.

Q2. Consider the following statements with respect to the Asian Development Bank (ADB): (Level – Medium)

1. India is a founding member of the Asian Development Bank.
2. It was established in 1991 after the end of the cold war and was modelled on the lines of the World Bank.
3. The Asian Development Outlook is an annual publication produced by the Asian Development Bank (ADB).

Which of the statements given above is/are correct?

- a. 1 and 2 only
- b. 2 and 3 only
- c. 1 and 3 only
- d. 1, 2 and 3

Answer: c

Explanation:

- **Statement 1 is correct**, India is a founding member of the Asian Development Bank.
- **Statement 2 is not correct**, ADB was established in the year 1966, with head office in Manila and is modelled on the lines of the World Bank.
- **Statement 3 is correct**, The Asian Development Outlook is an annual publication released by the Asian Development Bank (ADB).

Q3. Which of the following statements about Bharatnatyam is/are correct? (Level – Easy)

1. A Bharatnatyam performance ends with a tillana which has its origin in the tarana of Hindustani music.
2. To show the dexterity of the dancers in footwork and their control and balance over their bodies, techniques like dancing on the rim of a brass plate and with a pitcher full of water on the head were introduced in Bharatnatyam.
3. The person who conducts the dance recitation is the Nattuvanar.

Options:

- a. 1 and 2 only
- b. 2 and 3 only
- c. 1 and 3 only
- d. 1, 2 and 3

Answer: c

Explanation:

- **Statement 1 is correct**, A Bharatnatyam performance ends with a tillana which has its roots in the tarana of Hindustani music.

- **Statement 2 is not correct**, To show the dexterity of the dancers in footwork and their control and balance over their bodies, techniques like dancing on the rim of a brass plate and with a pitcher full of water on the head were introduced in Kuchipudi.
- **Statement 3 is correct**, The vocalist is called the Nattuvanar, usually, he is also the conductor of the entire performance.

Q4. With respect to Krishna River, which of the following statements is/are correct? (Level – Medium)

1. The largest tributary of the Krishna River is the Tungabhadra River
2. Almatti Dam is a hydroelectric project on the Krishna River in North Karnataka
3. Krishna River is the third-longest river of India
4. Musi is the left bank tributary of Krishna

Options:

- a. 1, 2 and 3 only
- b. 2, 3 and 4 only
- c. 1, 3 and 4 only
- d. 1, 2, 3 and 4

Answer: d

Explanation:

- **Statement 1 is correct**, Tungabhadra River is the main and largest tributary of Krishna and is formed by the Tunga and Bhadra rivers.
- **Statement 2 is correct**, The Almatti Dam also known as Lal Bahadur Shastri Dam is a hydroelectric project on the Krishna River in North Karnataka.
- **Statement 3 is correct**, Krishna River is the third-longest river in India in terms of length after Ganga and Godavari.
- **Statement 4 is correct**, Musi is a left bank tributary of Krishna along with Bhima, Paleru and Munneru.
 - Right bank tributaries include Venna, Koyna, Ghataprabha, Malaprabha and Tungabhadra.

Q5. Consider the following statements: (Level – Difficult) [PYQ 2021]

Statement 1: The United Nations Capital Development Fund (UNCDF) and the Arbor Day Foundation have recently recognized Hyderabad as 2020 Tree City of the World.

Statement 2: Hyderabad was selected for the recognition for a year following its commitment to grow and maintain the urban forests.

Which one of the following is correct in respect of the above statements?

- a. Both Statement 1 and Statement 2 are correct and Statement 2 is the correct explanation for Statement 1
- b. Both Statement 1 and Statement 2 are correct but Statement 2 is not the correct explanation for Statement 1
- c. Statement 1 is correct but Statement 2 is not correct
- d. Statement 1 is not correct but Statement 2 is correct

Answer: d

Explanation:

- **Statement 1 is not correct**, The Arbor Day Foundation, in collaboration with the **Food and Agriculture Organisation (FAO)** of the United Nations, declared Hyderabad as the “Tree City of the World” in 2020.
 - Mumbai has been declared as the “Tree City of the World 2021”.
- **Statement 2 is correct**, Hyderabad is selected for this recognition for its commitment to grow and maintain urban forestry.

I. UPSC Mains Practice Questions

1. The QUAD can help reshape economic alliances and regional security architecture. Critically analyse. (250 words; 15 marks) (GS II - IR)
2. How did the world reach to a point of global chip shortage? What are the hurdles associated with overcoming this shortage? Discuss with emphasis on its economic and strategic impact. (250 words; 15 marks) (GS III - Economy)