

**INDIAN ECONOMY**

❖ **The ban on the export of broken rice**

❖ **CONTEXT:** On September 9, the Centre instituted a ban on the export of broken rice. Additionally, it mandated an export duty of 20% on rice in husk (paddy or rough), husked (brown rice) and semi-milled or wholly-milled rice. The measures do not affect export of basmati or parboiled rice. The Secretary at the Department of Food and Public Distribution stated that the measures would ensure adequate availability of broken rice for consumption by the domestic poultry industry and for other animal feedstock. Additionally, it would sustain production of ethanol that would further assist the successful implementation of the Union government's Ethanol Blending Programme (EBP). However, the measures may affect countries dependent on Indian food exports in the face of a lost 'breadbasket' in Ukraine owing to the Russian conflict.

❖ **What does it have to do with inflation?**

- The lower the supply of a commodity, the higher would be the price of a product, which results in inflationary pressures. The adequacy of rice stocks in the country would ensure that markets do not experience excess demand and thus, trigger an abrupt price rise. For seven consecutive months, inflation has been above the Reserve Bank of India's 6% tolerability threshold. The Consumer Price Index (CPI), or retail-based inflation, stood at 7% in August this year with rural and urban inflation scaling 7.15% and 6.72% respectively. This was furthered by an uptick of 7.62% in food prices during the same period.
- The COVID-19 pandemic also had an impact on India's previously held surplus. As a reaction to the distresses caused by the pandemic to the vulnerable sections the Union Cabinet had introduced a food security program, called the Pradhan Mantri Garib Kalyan Anna Yojana (PM-GKAY) in March 2020. The scheme provisions an additional 5kg ration per person each month in addition to their normal quota of foodgrains under the National Food Security Act. In March, the scheme was extended for another six months until September 2022.
- It has been reported that foodgrain stocks (including rice, wheat and unmilled paddy) in the Food Corporation of India (FCI)'s central pool had dropped 33.5% on a year-over-year basis to 60.11 million tonnes as of September 1 prompting doubts on the continuation of the scheme.
- Research analysts observe that on the whole, though rice stocks should remain above buffer levels, the current export restrictions may not necessarily improve the demand-supply situation materially, implying, that there remains an upside risk to the price of rice. There is a risk that further curbs on rice exports could be imposed, particularly in categories still exempted.

❖ **What happened to rice production?**

- The major rice cultivation season in India is the Kharif season that entails sowing the crop during June-July and harvesting them in November-December.
- It is imperative to note that rice is a water-intensive crop which also requires a hot and humid climate. Thus, it is best suited to regions which have high humidity, prolonged sunshine and an assured supply of water. It is for this reason that the eastern and southern regions of the country, with sustainable humidity and suitable mean temperatures are deemed favourable for the crop.
- While the two regions are able to grow paddy crops throughout the year, higher rainfall and temperature prompt the northern regions to grow only one crop of rice from May to November. Andhra Pradesh, Telangana, Punjab, Haryana, Chhattisgarh, Odisha, Madhya Pradesh, Tamil Nadu, Maharashtra, Uttar Pradesh and Bihar are among the rice producing States in India.
- A perusal of Indian Meteorological Dept's data, between June 1 and September 14 illustrate that Uttar Pradesh, Jharkhand, Punjab and Bihar have experienced deficient rainfall. The latter refers to rainfall being 20-59% below normal in a particular region. Although West Bengal, the country's largest producer, has overall experienced a normal rainfall, its major productivity areas such as Nadia, Burdwan and Birbhum have had deficient rainfall. This indicates a potentially lower produce this year.

❖ **What are the concerns on ethanol blending?**

- Ethanol is an agro-based product, mainly produced from molasses, which is a by-product of the sugar industry. The EBP endeavours to blend ethanol with vehicular fuels as a means to combat the use of fossil fuels and in turn, rising pollution.
- As per the government, sugar-based feed stocks alone would not be able to meet its stipulated target of 20% ethanol blending by 2025.
- In the 2018-19 Ethanol Supply Year (ESY), the government had allowed the FCI to sell surplus rice to ethanol plants for fuel production. The idea was to have in place an insurance scheme and an emergency provision for distillers.
- However, in the ongoing ESY, because of supply constraints there has been an uptick in the procurement of rice from the FCI. The total ethanol produced from rice lifted from the FCI stood at 26.64 crore litres

whereas that from damaged food grains outside the FCI purview stood at 16.36 crore litres. This means that the production accruing from FCI rice has increased 10-fold from the 2.2 crore litres used in a full ESY. At the same time, production from damaged foodgrains stands at half.

- Thus, the export ban would endeavour to catch-up with this supply and additionally, unburden the FCI from provisioning to distillers.
- ❖ **What are the likely after-effects of the ban?**
- Geopolitical tensions between Russia and Ukraine have unsettled global food supply chains. With trade disrupted in the Black Sea region, Bloomberg reported in March that prices of rice are surging because traders are betting it will be an alternative for wheat which is becoming prohibitively expensive.
- India accounted for 41% of the total rice exports in the world in 2021, larger than the next four exporters (Thailand, Vietnam, Pakistan and United States) combined.
- As for broken rice, the United States Department of Agriculture (USDA) states that India accounted for more than half of the commodity's global exports in the first half of 2022. As per government figures, between April and August 2022, broken rice's share in the overall rice export mix (of India) was 22.78% compared to 18.89% in FY 2021.
- In descending order, China, Senegal, Vietnam, Djibouti and Indonesia are the biggest importers of India's broken rice.
- The losses to the exporters from the ban to be around ₹5,600 crore for the full year.

### INDIAN POLITY

- ❖ **The process of inclusion/exclusion from the Scheduled Tribes list**
- ❖ **CONTEXT: On September 14, the Union Cabinet approved a proposal to add several tribes to the list of Scheduled Tribes (ST) in States such as Himachal Pradesh, Tamil Nadu, Chhattisgarh and Uttar Pradesh, so that they can avail of benefits meant for STs, including reservation. The announcement by Minister of Tribal Affairs Arjun Munda came even as six tribal communities of Assam — Adivasi, Chutia, Koch-Rajbongshi, Matak, Moran and Tai-Ahom — threatened to launch protests over an "inordinate delay" in their inclusion in the ST list.**
- ❖ **Which communities have been added to the ST list?**
- The communities approved for inclusion in the ST list are the Hatti tribe in the Trans-Giri area of Sirmour district in Himachal Pradesh, the hill tribes of Narikoravan and Kurivikkaran of Tamil Nadu, the Binjhia community in Chhattisgarh and the Gond community in certain districts of Uttar Pradesh. The Cabinet has approved the addition of several alternative names for already existing Scheduled Tribes in Chhattisgarh and Karnataka so that the difference in spellings and pronunciations do not result in members of these communities being left out of the benefits meant for them.
- Significantly, even as the Union Cabinet has decided to include these communities under the ST list, this is not the first time they have been categorised for benefits of reservation. Most of these communities had been either included in the list of Scheduled Castes (SC) or Most Backward Classes till now.
- ❖ **How a community is added or removed from SC, ST lists?**
- The process begins at the level of a State or Union Territory, with the concerned government or administration seeking the addition or exclusion of a particular community from the SC or ST list. The final decision rests with the President's office issuing a notification specifying the changes under powers vested in it from Articles 341 and 342.
- The inclusion or exclusion of any community in the Scheduled Tribes or Scheduled Castes list come into effect only after the President assents to a Bill that amends the Constitution (Scheduled Castes) Order, 1950 and the Constitution (Scheduled Tribes) Order, 1950, as is appropriate, after it is passed by both the Lok Sabha and Rajya Sabha.
- A State government may choose to recommend certain communities for addition or subtraction from the list of SCs/STs based on its discretion. This recommendation may come from studies it commissions like in the case of classifying the Hatti community in Himachal Pradesh. Following this, the proposal to include or remove any community from the Scheduled List is sent to the Union Ministry of Tribal Affairs from the concerned State government. After this, the Ministry of Tribal Affairs, through its own deliberations, examines the proposal, and sends it to the Registrar General of India (RGI). Once approved by the RGI, the proposal is sent to the National Commission for Scheduled Castes or National Commission for Scheduled Tribes, following which the proposal is sent back to the Union government, which after inter-ministerial deliberations, introduces it in the Cabinet for final approval.
- As for the communities approved for addition to the list by the Cabinet earlier, a Bill was introduced in Parliament by the Tribal Affairs Minister in 2022, specifying the exclusion of the Gond community from the SC list in four districts of Uttar Pradesh and moving them to the ST list. Similarly, another Bill was also

introduced to shift certain communities in Jharkhand from the SC list to the ST list and add synonyms and variations in spellings for certain other communities in the ST list.

❖ **What is the criteria to begin the process?**

- To establish whether a community is a Scheduled Tribe, the government looks at several criteria, including its ethnological traits, traditional characteristics, distinctive culture, geographical isolation and backwardness.
- However, in March 2022 the Supreme Court said it wanted to fix fool-proof parameters to determine if a person belongs to a Scheduled Tribe and is entitled to the benefits due to the community. It said the judiciary was no longer sure about an “affinity test” used to sift through distinct traits to link a person to a tribe. There is the likelihood, that contact with other cultures, migration and modernisation would have erased the traditional characteristics of a tribe. An apex court Bench of Justices Hemant Gupta and V. Ramasubramanian referred the question of fixing the parameters to a larger Bench, pointing out that the issue was a “matter of importance” when it came to issuing caste certificates.

❖ **How many Scheduled Tribes are there officially?**

- According to the Scheduled Tribes in India as revealed in Census 2011, there are said to be 705 ethnic groups listed as Scheduled Tribes under Article 342.
- Over 10 crore Indians are notified as STs, of which 1.04 crore live in urban areas. The STs constitute 8.6% of the population and 11.3% of the rural population.

**INTERNATIONAL AFFAIRS**

❖ **What are the ‘colour revolutions’ that China’s Xi Jinping has warned against?**

❖ **CONTEXT:** Chinese President Xi Jinping recently appealed to Russia, India, and other members of the Shanghai Cooperation Organisation (SCO) to cooperate with each other in order to prevent foreign powers from destabilising their countries by inciting “colour revolutions”.

❖ **What are “colour revolutions”?**

- Colour revolutions refer to a series of uprisings that first began in former communist nations in Eastern Europe in the early 2000s, but are also used in reference to popular movements in the Middle East and Asia. Most have involved large-scale mobilisation on the streets, with demands for free elections or regime change, and calls for removal of authoritarian leaders.
- Protesters often wear a specific colour, such as in Ukraine’s Orange Revolution, but the term has also been used to describe movements named after flowers like the Jasmine Revolution in Tunisia. In 2019, China had said the protests in Hong Kong had taken on “colour revolution characteristics”.
- Russia and China have long criticised colour revolutions for being destabilising influences that have been orchestrated by the United States and its Western allies to overthrow regimes in order to further their own geopolitical interests.

❖ **A look at some of the better known “colour revolutions”.**

➤ **Orange Revolution:** It refers to a series of protests that occurred in Ukraine between November 2004 and January 2005. The movement was in response to reports from international and domestic observers that claimed that the country’s 2004 Presidential election runoff between Viktor Yushchenko, an ally of the West, and then incumbent President Viktor Yanukovych, who was backed by Moscow, was rigged in favour of the latter.

- The election commission had declared Yanukovych the winner of the election, drawing criticism from the US and European Union who said they would not recognise the results. Russia, however, claimed to have found no evidence of election fraud.
- In the aftermath of the elections, protesters wearing orange took to the streets across the country. Orange was Yushchenko’s campaign colour. The results were subsequently annulled and the Ukrainian Supreme Court ordered a re-vote, in which Yushchenko emerged victorious and the movement was concluded.

➤ **Tulip Revolution:** Also called the First Kyrgyz Revolution, the movement led to the ouster of Kyrgyzstan’s President Askar Akayev in early 2005. These protests were in response to the parliamentary elections in February, in which Akayev’s allies and family members won.

- Foreign observers argued that the election process was deeply flawed, and the Organisation for Security and Co-operation in Europe (OSCE) claimed that election fraud had occurred. According to a Wall Street Journal report from February 2005, the US government had provided aid to the Kyrgyz opposition before the election via non-governmental agencies.
- Protests erupted in the country against Akayev who had been President since 1990. In March 2005, opposition leaders joined demonstrators and they began to occupy the area outside the Parliament building in the capital city of Bishkek. As the movement gained momentum across the country, there were growing calls for the removal of Akayev. He refused to negotiate at first, but on March 24 that year, fled the country with his family, eventually finding his way to Russia, where he resigned the following month.

- **Jasmine Revolution:** The popular uprising that occurred between December 2010 to January 2011 in Tunisia was in response to the underlying corruption, unemployment, inflation and lack of political freedoms in the country.
- The immediate catalyst for the movement was the self immolation of a young vegetable vendor in front of a government building in the town of Sid Bouzid after his wares were confiscated by the police. His action, which became the symbol of the hardship and injustice Tunisians faced under the reign of longtime President Zine el-Abidine Ben Ali, ignited protests across the country.
- Western media houses were quick to adopt the phrase Jasmine revolution, ostensibly in reference to Tunisia's national flower, to describe the movement.
- The Tunisian government faced widespread domestic and international criticism for the violence used by security forces to quell the movement. Hundreds were reportedly killed and thousand injured, and President Ali's pledges of reforms did little to ease tensions.
- The protests not only led to Ali's ouster in January 2011, but also inspired a wave of protests in North Africa and the Middle East, which came to be known as the Arab Spring.

### PRELIMS

#### 1. Essential medicines list

❖ **CONTEXT:** The Union Health Ministry recently released the new National List of Essential Medicine (NLEM)-2022, revising it after a seven-year period. The new list, issued on September 13, has included more cancer medicines, newer diabetes drugs, and even four drugs that are under patent.

#### ❖ **What is the National List of Essential Medicines?**

- Curated by experts in consultation with stakeholders, the list includes medicines that are needed to address the priority healthcare needs of the majority of the population. The drugs included are those that are best for the treatment of a particular condition and are cost-effective at the same time. This is the reason the list almost always sees the inclusion of generics (unbranded medicines, like paracetamol instead of crocin).
- The list usually includes medicines that are a part of government's health programmes, such as bedaquiline, included in the 2022, that is used in the country's TB elimination programme.
- Framed on the principles of the World Health Organisation's essential medicine list, India's first list was developed in 1996. It has since been modified four time – in 2003, 2011, 2015, and now in 2022.
- The revisions are done keeping in mind the changing profile of diseases in the country, newer drugs becoming available in the market, drugs becoming obsolete or being banned for certain risks, and newer treatment protocols.
- The list creates a framework for procurement of medicines at government healthcare facilities – the essential medicines should ideally be available at all healthcare centres depending on the level of care (NLEM marks all drugs as P, S, or T depending on whether they ought to be available at primary, secondary or tertiary healthcare facilities).
- It also helps hospitals create their drug policies such as which medicines to be used – the NLEM-2022 switched up several antibiotics depending on the resistance pattern, including a strong, broad-spectrum antibiotic Meropenem in the list.
- It helps government facilities that do provide free medicines to prioritise which ones; and can also be used by agencies reimbursing the cost. In addition, the list helps in training young doctors on rational use of medicines.

• But, the most important use of the list is to make these medicines affordable to the general population.

#### ❖ **How does the NLEM make the medicines affordable?**

- The government has the power to control the prices of certain medicines, those needed in public interest, through the Drug Prices Control Order.
- The National List of Essential Medicines forms the primary basis for considering a drug as essential and controlling its prices. Additionally, the prices of drugs other than those included in the NLEM may also be controlled through the DPCO.
- Once a drug is included in the NLEM, its prices are controlled by the central government and cannot be changed by companies themselves.
- Based on this list, the NPPA will decide the ceiling prices. The prices of medicines under the NLEM cannot be increased by the companies themselves, but every year the prices are increased or decreased as per the Wholesale Price Index, meaning the prices of these medicines cannot be increased unreasonably.

#### ❖ **What are the significant additions to the NLEM-2022?**

- The new list has added 34 medicines that were not in the NLEM-2015, most significantly it has added four cancer medicines — Bendamustine Hydrochloride — that used for treating certain types of blood and lymph node cancers, Irinotecan HCl Trihydrate used for treating colorectal and pancreatic cancers,

Lenalidomide for treating various type of cancers, and Leuprolide acetate for treating prostate cancer. Cancer therapies are usually very costly, but also have higher trade margins.

- The list has also included newer class of drugs that are now routinely used for diabetes management by doctors – the medicine Tenelegliptin and the insulin Glargine.
- The rotavirus vaccine which is now a part of the government’s universal immunisation programme has also been included.
- Importantly, the list has also included at least four drugs that are still under patent — such as Bedaquiline and Delamanid for TB, Dolutegravir for HIV, and Daclatasvir for the treatment of Hepatitis C – all of which are part of government’s national health programmes. This is the first time that patented drugs have been included in the list as these drugs usually cost more.
- “A question is raised time and again whether patented drugs should be included in the NLEM. So, the committee, as well as the stakeholders and the ministry, took the decision that patented drugs can also be a part of NLEM if they fulfil the criteria (of need, safety, efficacy, and cost effectiveness). And, these medicines are very important and should be a part,” said Dr YK Gupta, who heads the Standing National Committee on Medicines that was set up in 2018 to modify the list.
- The list has made another notable addition – it has included nicotine and opioid replacement therapy, with no therapy in the category available in the previous lists.

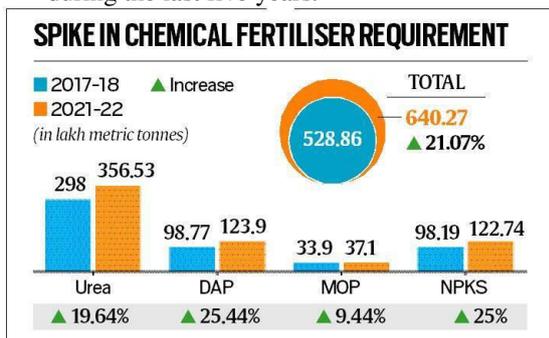
❖ **Which drugs were removed from the NLEM-2022?**

- There were 26 drugs that were deleted from the previous list, bringing the total number of drugs in the NLEM-2022 to 384. The most significant deletions were three anti-tubercular drugs, including Kanamycin injection that was used in patients with drug resistant TB. Besides with the government now introducing an all-oral regimen for such patients, the drug was also associated with severe side effects such as kidney problems and hearing loss.
- While adding antibiotics like meropenem and anti-parasitic ivermectin (which is also a part of the government’s lymphatic filariasis programme), the list has deleted antimicrobials like capreomycin, ganciclovir (that is known to be a carcinogen and lead to embryo malformation), and a hepatitis medicine with poor efficacy.
- Petroleum jelly and bleaching powder have also been removed from the list.

**2. To curb use of chemical fertilisers, Govt to give nod to PM PRANAM**

❖ **CONTEXT:** The Union government intends to launch a scheme named PM PRANAM — to reduce the use of chemical fertilisers by incentivising states. Union Ministry of Chemicals and Fertilizers, which has mooted the idea of PM-PRANAM, shared the details of the proposed scheme with state government officials during the National Conference on Agriculture for Rabi Campaign held on September 7. The ministry has also sought their suggestions on the features of the proposed scheme

- The proposed scheme, short for PM Promotion of Alternate Nutrients for Agriculture Management Yojana, also aims to bring down the subsidy burden on chemical fertilisers, which is estimated to reach Rs 2.25 lakh crore in 2022-23, 39 per cent higher than last year’s figure of Rs 1.62 lakh crore.
- It assumes significance in view of the sharp increase in the overall fertiliser requirement in the country during the last five years.



- The scheme will have no separate budget and will be financed through the “savings of existing fertiliser subsidy” under schemes run by the Department of Fertilizers.
- 50 per cent of subsidy savings will be passed on as a grant to the state that saves the money.
- 70 per cent of the grant provided under the scheme can be used for asset creation related to technological adoption of alternate fertilisers and alternate fertiliser production units at village, block and district levels.
- The remaining 30 per cent grant money can be used for rewarding and encouraging farmers, panchayats, farmer producer organisations and self-help groups that are involved in the reduction of fertiliser use and awareness generation.

- A state's increase or reduction in urea in a year will be compared to its average consumption of urea during the last three years. For this purpose, data available on a Fertilizer Ministry dashboard, iFMS (Integrated Fertilizers Management System), will be used.
- ❖ **Expenditure on fertiliser in india**
- Official records show that the actual expenditure on fertiliser subsidy was 1.27 lakh crore in 2020-21. In the Union Budget 2021-22, the government budgeted an amount of Rs 79,530 crore, which increased to Rs 1.40 lakh crore in the revised estimates (RE). However, the final figure of fertiliser subsidy touched Rs 1.62 lakh crore in 2021-22.
- In the current financial year (2022-23) the government has allocated Rs 1.05 lakh crore. The fertiliser subsidy figure could cross Rs 2.25 lakh crore during this year.
- The total requirement of four fertilisers Urea, DAP (Di-ammonium Phosphate), MOP (Muriate of potash), NPKS (Nitrogen, Phosphorus and Potassium) in the country increased by 21 per cent to 640.27 lakh metric tonnes (LMT) in 2021-22 from 528.86 lakh metric tonnes in 2017-18.
- The maximum increase — 25.44 per cent — has been recorded in the requirement of DAP. It went up from 98.77 LMT in 2017-18 to 123.9 LMT in 2021-22. Urea, the most used chemical fertiliser in the country, recorded an increase of 19.64 per cent — from 298 LMT in 2017-18 to 356.53 in 2021-22 — in the last five years.
- The move is in line with the government's focus on promoting a balanced use of fertilisers or alternative fertilisers in the last few years.
- To plug leakages in fertiliser subsidy, the Centre had introduced a direct benefit transfer system in fertilizers with effect from October 2016.
- Under this system, 100 per cent subsidy on various fertiliser grades is released to the fertiliser companies on the basis of actual sales made by the retailers to the beneficiaries.
- Besides, the government had incorporated new nutrients like Nano urea and "bio-stimulants" in the Fertilizer Control Order-1985 (FCO). In addition to this, initiatives like Soil Health Card and neem-coated urea have also been taken.
- 3. **The significance of Ethereum Merge and its impact on blockchain architecture**
- ❖ **CONTEXT: Ethereum, the world's second most valuable cryptocurrency, has completed a significant software overhaul which promises to ramp up security of the cryptocurrency while claiming to cut down on its carbon footprint, nearly entirely.**
- The revamp, known as 'The Merge,' will cast aside the need for crypto miners and gigantic mining farms, who had previously driven the blockchain under a mechanism called 'proof-of-work' (PoW). Instead, it has now shifted to a 'proof-of-stake' (PoS) mechanism that assigns 'validators' randomly to approve transactions and earn a small reward.
- The move to PoS will reduce ethereum's energy consumption by nearly 99.95 per cent, according to the Ethereum Foundation, a non-profit organisation dedicated to supporting the cryptocurrency and its related technologies.
- ❖ **What has exactly changed?**
- Ethereum is a decentralised cryptocurrency, meaning that it does not have institutions like banks approving the transactions that happen on its network – the approvals were earlier happening under the PoW consensus mechanism which was essentially done by miners.
- Miners would compete to solve complex mathematical puzzles using a massive infrastructure of cutting edge computer hardware, and the first one to solve the puzzle would be chosen as the validator.
- This method was almost entirely dependent on crypto farms, which are massive warehouses lined with rows of computers which would solve the puzzles.
- There was, however, one big problem – these mining farms were energy guzzlers, leading to one of the biggest criticisms of the crypto industry that they sometimes consumed more electricity than entire countries, and were therefore a big concern in terms of environmental sustainability.
- Enter 'The Merge' and the shift to the PoS consensus mechanism. Ethereum is still a decentralised platform, but under the new concept, it would not need miners and mining farms to authenticate transactions anymore. Instead, a validator will be randomly assigned using an algorithm from a pool of people who 'stake' their coins, which essentially means pledging at least 32 Ethereum tokens on the network. This would entirely eliminate the need for miners on the Ethereum network.
- ❖ **Why is the 'Merge' important?**
- The development comes amid growing regulatory scrutiny over cryptocurrencies which have taken a severe beating in their value since the beginning of 2022. One of the biggest benefits being touted about 'The Merge' is that it will make transactions on the Ethereum network extremely secure.
- Apart from that, it is also being seen as an environmentally conscious move as Ethereum is expected to now consume 99 per cent or so less energy.

- Given that some of the most popular applications of cryptocurrencies such as non-fungible tokens (NFTs) and decentralised finance (DeFi) are based on the Ethereum network, the overhaul could have far-reaching consequences in the future.
- ❖ **What's next for Ethereum?**
- The network will undergo further upgrades which called the “surge,” “verge,” “purge,” and “splurge”.
- **Surge:** This refers to the addition of Ethereum sharding, which promises to process transactions on the network much faster than now. Sharding basically means dividing transactions across several different chains in a way that will decrease fees and speed up transactions. “By the end, ethereum will be able to process 100,000 transactions per second.
- **Verge:** The verge will implement what Buterin called “Verkle trees” and “stateless clients,” which will allow users on the network to become validators without having to store extensive amounts of data on their machines.
- **Purge:** As the name suggests, this step will involve purging old network history. “The purge: trying to actually cut down the amount of space you have to have on your hard drive, trying to simplify the Ethereum protocol over time and not requiring nodes to store history.
- **Splurge:** Buterin called this phase “the fun stuff.” It aims at making sure that the network continues to run smoothly and that the updates to the protocol in the previous sections do not cause any issues.

### ANSWER WRITING

**Q. How and to what extent would micro-irrigation help in solving India's water crisis?**

Water is a scarce natural resource but the major requirement in the agricultural sector. The efficient use of available water for irrigation is a major challenge. A nation with annual water availability of below 1,700 kilolitres per head is considered water deficient. India's per capita water availability is estimated at 1,428 kilolitres per year.

Micro-irrigation is a modern method of irrigation by which water is irrigated through drippers, sprinklers, foggers and by other emitters on the surface or subsurface of the land. Sprinkler irrigation and drip irrigation are the commonly used micro-irrigation methods.

Significance of micro-irrigation:

- Micro-irrigation ensures water use efficiency. It applies water directly to the root zone, the practice reduces loss of water through conveyance, run-off, deep percolation and evaporation.
- Water savings in comparison with flood irrigation are to the tune of 30-50%.
- Electricity consumption falls significantly, as being water efficient it requires less water to be pumped.
- The localised water application in micro-irrigation prevents fertilizers from washing away, and so reduces nutrient loss or leaching. The micro-irrigation system can also be effectively used to apply fertilizers (fertigation) in a targeted way so as to prevent weed growth.
- Micro-irrigation, by virtue of localised water application, avoids soil erosion. It does not require land leveling and can irrigate fields that are irregularly shaped, making it much less labor-intensive and less costly.

Nevertheless, micro-irrigation also has certain limitations:

- Expense especially initial cost is high mainly for marginal and small farmers.
- Maintenance cost for the tubes, sprinklers may go out of pocket for small farmers.
- The lifetime of the tubes used in drip irrigation can be shortened by the sun causing wastage.
- It needs more awareness and higher rate of adoption in water stressed areas.

The future revolution in agriculture will come from precision farming. Micro-irrigation can, indeed, be the stepping stone for achieving the goal of making farming sustainable, profitable and productive.

### MCQs

1. Among the following, which one is the largest exporter of rice in the world in the last five years?
  - a) China
  - b) India**
  - c) Myanmar
  - d) Vietnam
2. With reference to chemical fertilizers in India, consider the following statements:
  1. At present, the retail price of chemical fertilizers is market-driven and not administered by the Government.
  2. Ammonia, which is an input of urea, is produced from natural gas.
  3. Sulphur, which is a raw material for phosphoric acid fertilizer, is a by-product of oil refineries.

Which of the statements given above is/are correct?

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

3. Consider the following statements regarding National Biofuel Policy, 2018
1. It aims to reach 30% ethanol blending by the year 2030.
  2. Fourth generation biofuels are biofuels derived from algae.
- 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**
4. Consider the following pairs
1. Kyrgyzstan – Orange revolution
  2. Tunisia- Tulip revolution
  3. Ukraine – Jasmine revolution
- How many above pairs are correctly matched?
- a) Only one pair
  - b) Only two pairs
  - c) All the three pairs
  - d) None of the above pairs**
5. A series of uprisings of people referred to as ‘Arab Spring’ originally started from which of the following country?
- a) Egypt
  - b) Lebanon
  - c) Syria
  - d) Tunisia**
6. With reference to Biosimilar medicine, consider the following statements
1. It is a biologic medical product that is almost an identical copy of an original product that is manufactured by the same company.
  2. It contains active substances from a biological source, such as living cells or organisms.
  3. Biosimilar medicines are cheaper than Generic medicines.
- Which of the above statements is/are correct?
- a) 1 and 3 only
  - b) 2 only**
  - c) 2 and 3 only
  - d) 1, 2 and 3
7. Consider the following statements
1. Once a drug is included in the National List of Essential Medicines (NLEM), its prices are controlled by the central government and cannot be changed by companies themselves
  2. The prices of medicines under the NLEM can be increased or decreased as per the Wholesale Price Index
- Choose the correct statement using the codes given below
- a) 1 only
  - b) 2 only
  - c) Both 1 and 2**
  - d) Neither 1 nor 2
8. PM-PRANAM scheme often mentioned in news is related to which of the following?
- a) Agriculture**
  - b) Sports
  - c) Leather based industry
  - d) Tourism
9. The top pharmaceutical patents are held by which of the following country?
- a) Switzerland**
  - b) UK
  - c) US
  - d) India
10. The National Financial Reporting Authority is functions under which of the following?
- a) RBI
  - b) SEBI
  - c) Ministry of Cooperate Affairs**
  - d) Ministry of Finance