

INTERNATIONAL ORGANISATION

❖ **OPEC+**

❖ **CONTEXT:** The grouping of the world's largest oil-producing countries, the Organisation of the Petroleum Exporting Countries (OPEC) and its allies, together known as OPEC+, decided to cut oil production by 2 million barrels per day (bpd).

- This is the largest cut since the beginning of the Covid-19 pandemic. Brent crude, the international benchmark, was up 28 cents or 0.3%, at \$92.08 a barrel after the cut was announced, reported Reuters.
- In light of recent falling gas prices, OPEC+ officials had decided in September to reduce oil output by a modest 100,000 bpd after they first agreed in the previous month to increase production by the same amount.

❖ **What is OPEC+?**

- Established in 1960 by founding members Iran, Iraq, Kuwait, Saudi Arabia and Venezuela, OPEC has since expanded and now has 13 member states. Iran, Iraq, Kuwait, United Arab Emirates(UAE), Saudi Arabia, Algeria, Libya, Nigeria, Gabon, Equatorial Guinea, Republic of Congo, Angola, and Venezuela are members of OPEC.
- Ecuador suspended its membership in December 1992, rejoined OPEC in October 2007, but decided to withdraw its membership of OPEC effective 1 January 2020. Qatar terminated its membership on 1 January 2019.
- With the addition of another 11 allied major oil-producing countries that include Russia, the grouping is known as OPEC+.
- The objective of the organisation is to "coordinate and unify the petroleum policies of its Member Countries and ensure the stabilisation of oil markets in order to secure an efficient, economic and regular supply of petroleum to consumers, a steady income to producers and a fair return on capital for those investing in the petroleum industry," according to the OPEC website.
- It is headquartered in Vienna, Austria. OPEC membership is open to any country that is a substantial exporter of oil and which shares the ideals of the organization.
- OPEC's formation by five oil-producing developing countries in Baghdad in September 1960 occurred at a time of transition in the international economic and political landscape, with extensive decolonisation and the birth of many new independent states in the developing world.
- Previously controlled by western-dominated multinational oil companies known as the "Seven Sisters," OPEC sought to give the oil-producing nations greater influence over the global petroleum market. They account for roughly 40 per cent of the world's crude oil and 80 per cent of the globe's oil reserves, according to estimates from 2018. They usually meet every month to determine how much oil the member states will produce.
- However, many allege that OPEC behaves like a cartel, determining the supply of oil and influencing its price in the world market.

❖ **Why are they slashing production?**

- Oil prices skyrocketed after Russia's invasion of Ukraine in February 2022, and have since begun to soften over the past few months, before dropping sharply to under \$90 in September due to fears of a recession in Europe and reduced demands from China because of its lockdown measures.
- Recent cut is the biggest of its kind since 2020 when OPEC+ members slashed outputs by 10 million bpd during the Covid-19 pandemic, Reuters reported.
- The reductions would boost prices and be extremely beneficial for the Middle Eastern member states, to whom Europe has turned for oil after levelling sanctions against Russia since it invaded Ukraine.
- OPEC+ members are concerned that a faltering global economy would reduce the demand for oil, and the cuts are seen as a way to protect profits. Increased oil prices, which first occurred during the invasion of Ukraine, have helped Saudi Arabia, one of the founding members of OPEC, become one of the world's fastest-growing economies.
- Western media raised the possibility that Russia might be influencing OPEC, to make it more expensive for the West to extend energy sanctions on Russia. To the extent that prices rise, it will make it that much more challenging for Europe to proceed with its sanctions on Russian oil in December.

❖ **Who is against this decision?**

- The United Arab Emirates (UAE) and Kuwait, in particular, are said to be concerned that extended cuts would interfere with their plans to increase oil output capacity.
- The move is likely to be highly detrimental to the US, which has repeatedly asked the organisation to increase oil production. The modest increase of 100,000 bpd in August has since been replaced by attempts to reduce production by Saudi Arabia.
- According to media slashes in reduction and subsequently increased oil prices can be particularly dangerous to Biden, who is trying to reduce inflation rates before the midterm elections in November. Over the past few days, Biden administration's senior officials have been lobbying their counterparts in Kuwait, Saudi Arabia and the UAE to vote against reducing oil production.
- The US has not publicly accepted these attempts, however. White House press secretary Karine Jean-Pierre recently told reporters that the US is not part of OPEC+ and did not reveal any attempts made by her administration.

❖ **What should Indian decision-makers do today to respond to such a uncertain future of the international petroleum market?**

- It should fill the oil caverns with strategic reserves. Prices may fall further but rather than bottom fish, it should leverage the availability of capacity to secure discounted supplies. The world has run out of storage capacity and producers may pay premium dollar to find space for their unsold cargoes.

- It should increase its imports of gas (LNG) from Australia, Africa and the US. This will reduce the political risks of dependency on oil supplies from the Middle East. Gas is also now economically competitive. The landed price of LNG is low enough to kick-start some of the stranded gas-based power plants.
- It should unthread the “patchwork quilt of authority” exercised by bureaucrats, regulators and politicians, which today stifles management and operational efficiency of the petroleum companies.
- It should create an institutional basis for an integrated energy policy. If there is one message we must internalise from COVID, it is the importance of collaboration and coordination.
- ❖ **What are India’s strategic petroleum reserves, and why are they needed?**
- India’s strategic reserves are the effort of a broader plan to build an emergency stockpile with millions of barrels of crude oil, on the lines of the reserves that the US and its Western allies set up after the first oil crisis of 1973-74. Under the first stage of the Strategic Petroleum Reserve project, underground rock caverns with total storage of 5.33 MMT, or about 38 million barrels of crude oil, have been commissioned at three locations.
 - Visakhapatnam (1.33 MMT)
 - Mangalore (1.5 MMT)
 - Padur in Karnataka (2.5 MMT)
- These facilities can provide for about 9.5 days of India’s crude oil requirements based on 2019-20 consumption levels.
- The combined storage facilities of Oil Marketing Companies (OMCs) in the country can hold enough crude oil to meet 64.5 days of requirement, bringing the total national capacity for storage of crude oil and petroleum products to 74 days, according to the Centre.
- India is in the process of expanding its strategic petroleum reserve storage by 6.5 MMT at two locations.
 - Chandikhol in Odisha (4 MMT)
 - Padur (2.5 MMT).
- The International Energy Agency (IEA) recommends that all countries hold crude oil stocks worth 90 days of imports. India imports about 85 per cent of its crude oil requirements. Crude oil from the reserves are to be released by an empowered committee constituted by the government, in the event of any supply disruptions from abroad. These include any natural calamity or unforeseen global event leading to an abnormal increase in prices.
- India decided to release 5 million barrels of oil from its strategic reserves as part of a coordinated challenge led by the US against the OPEC+ producers’ cartel’s move to curb output, was the first time that India dipped into its reserves to leverage it as a geopolitical tool. This was the first instance of India using strategic reserves to influence international prices.
- ❖ **What is IEA?**
- The International Energy Agency (IEA) is an autonomous organisation with its headquarters in Paris, France.
- It works to ensure reliable, affordable and clean energy.
- Its genesis can be traced back to 1973 (set up in 1974) oil crisis after the world witnessed a steep increase in oil prices due to the OPEC cartel. The IEA is made up of 31 member countries and 8 association countries.
- The IEA has four main areas of focus, i.e. 4Es: Energy security, Economic development, Environmental awareness and Engagement worldwide.
- India became an associate member of the International Energy Agency in 2017.

PRELIMS

1. Aatmanirbhar in defence production:

- ❖ **CONTEXT: India ranks fourth among 12 Indo-Pacific nations in self-reliant arms production capabilities, according to a study released in October 2022 by the Stockholm International Peace Research Institute (SIPRI), a widely respected independent resource on global security. China tops the list, Japan is second, South Korea is in third place, and Pakistan is at number 8.**
- The study, which measures self-reliance until 2020, is based on three indicators of self reliance in each country:
 - **Arms procurement** — imports, licensed and domestic production as a proportion of the government’s total procurement of major conventional arms;
 - **Arms industry** — the study presents the five largest arms companies in each country, where data are available, ranked by sales of arms and military services in 2020 to both domestic and export customers;
 - **Uncrewed maritime vehicles, the sea equivalent of drones** — covering both uncrewed surface vehicles (USVs) and uncrewed underwater vehicles (UUVs), meant to provide a qualitative understanding of how countries are engaging domestic research institutes and firms to produce such cutting edge systems.

ARMS EXPORTS & IMPORTS; MILITARY SPENDING IN INDO-PACIFIC REGION

Country	Exporter rank*	Importer rank*	Largest supplier**	Military Spending 2021****	Spending rank***
Australia	3	2	US (69%)	31,754	5
China	1	3	Russia (77%)	293,352	1
India	4	1	Russia (54%)	76,598	2
Indonesia	5	8	US (23%)	8,259	9
Japan	14	6	US (97%)	54,124	3
South Korea	2	4	US (58%)	50,227	4
Malaysia	NA	16	Spain (32%)	3,830	13
Pakistan	13	5	China (72%)	11,305	8
Singapore	7	9	France (43%)	11,115	7
Taiwan	12	15	US (100%)	12,958	6
Thailand	15	10	South Korea (25%)	6,605	10
Vietnam	11	7	Russia (66%)	5,500*****	NA

- The study's choice of maritime domain was because the Indo-Pacific region is a "maritime theatre", and most of its flashpoints involve navies. The 12 countries in the study were selected because they have the highest military spending in the region — Australia, China, India, Indonesia, Japan, South Korea, Malaysia, Pakistan, Singapore, Taiwan, Thailand and Vietnam.
- According to the study, understanding and determining the extent of self-reliance in the Indo-Pacific region, which has several ongoing flashpoints, is crucial for trust and confidence-building among states. This region has also seen a growing allocation by states for defence procurement. Eighteen arms manufacturing companies based in the region were ranked among the world's largest arms companies in 2020.
- According to the study in a region where tensions among neighbours are rising, this report contributes to transparency with regards to levels of self-reliance in domestic arms production, allowing for an independent assessment of the region's respective arms industries.
- **China** was the world's fifth largest arms importer in 2016-20.
 - Its self-reliance policies, and its high economic growth in that period meant that the Chinese arms industry now increasingly fulfills the requirements of the People's Liberation Army (PLA).
 - Its high volume of imports in absolute terms accounts for only 8 per cent of total procurement for the period, the lowest share for any of the 12 governments studied in this report.
 - China's arms industry primarily involves nine large state-owned enterprises (SOEs). All eight companies for which data are available are in the top 100, with four in the top 10 in 2020.
 - Four are dominant in the aerospace and aviation sectors, two in land systems, one in electronics, one in shipbuilding, and one in nuclear power.
 - The PLA is the main customer for the arms companies. China also has 17 ongoing projects, in collaboration with universities and other agencies to develop "long-range precision, intelligent, stealthy or unmanned weaponry and equipment.
- **India** is ranked as the second largest importer of arms for its armed forces in 2016-20.
 - India is highly dependent on imports of complete foreign major arms, including many produced under licence or as components for its domestic production.
 - Of India's total volume of procurement in 2016–20, 84 per cent was of foreign origin.
 - Domestic arms companies provide only 16 per cent of its total procurement.
 - According to the study, the significant arms sales of local firms and the high level of licensed production push India to fourth position in the list.
 - Hindustan Aeronautics Ltd, Indian Ordnance Factories, Bharat Electronics, Mazagaon Docks and Cochin Shipyard are among the major Indian arms servicing companies.
 - Ashok Leyland, one of the largest suppliers of trucks to the Indian Army, is the only company ranked in the top 50 in the Indo-Pacific.
 - India has seven Uncrewed Maritime Vessel projects ongoing. In the private sector, Larsen & Toubro has been developing AUV prototypes on its own and in collaboration with foreign partners, such as Italy's EdgeLab, while DRDO and the Central Mechanical Engineering Research Institute have been considering development of AUV prototypes.
- 2. Panel to study SC status of Dalits post conversion**
 - ❖ **Context: The Union government has now formed a three-member Commission of Inquiry headed by former Chief Justice of India, Justice K.G. Balakrishnan, to examine whether the Scheduled Caste (SC) status can be accorded to Dalits who have over the years converted to religions other than Sikhism or Buddhism.**
 - Currently, the Constitution (Scheduled Castes) Order, 1950 provides for only those belonging to Hindu, Sikh or Buddhist communities to be categorised as SCs.
 - When enacted, the Order only allowed for Hindu communities to be classified as SCs based on the social disabilities and discrimination they faced due to untouchability.
 - It was amended in 1956 to include Sikh communities and again in 1990 to include Buddhist communities as SCs.
 - The three-member commission will also comprise Professor Sushma Yadav, member, UGC, and retired IAS officer Ravinder Kumar Jain, and has been given a two-year deadline to submit a report on the issue.
 - The commission's inquiry will also look into the changes an SC person goes through after converting to another religion and its implications on the question of including them as SCs.
 - These will include examining their traditions, customs, social and other forms of discrimination and how and whether they have changed as a result of the conversion.
 - The government has also tasked the Justice Balakrishnan Commission with examining the impact of such a decision on these existing SC communities.
- 3. Cheetah Task Force constituted**
 - ❖ **CONTEXT: Ministry of Environment, Forest and Climate Change has constituted a Task Force for monitoring Cheetah introduction in Kuno National Park, Madhya Pradesh and other suitable designated areas.**
 - The National Tiger Conservation Authority (NTCA) would facilitate the working of Cheetah Task Force and render all necessary help.
 - The Task Force shall be in-force for a period of two years. This task force may appoint a subcommittee to regularly visit the Cheetah introduction area as and when decided by them.
 - Cheetah restoration is part of a prototype or model for restoration of original cheetah habitats and their biodiversity.

- This will help to stem the degradation and rapid loss of biodiversity.
- Bringing back a top predator restores historic evolutionary balance resulting in cascading effects on various levels of the eco-system.
- Bringing the cheetah back is expected to have important conservation ramifications.
- The cheetah has been the evolutionary natural selection force that has shaped the adaptation of high speeds in Indian antelopes and gazelles.
- By restoring cheetah, also be able to save not only its prey base comprising certain threatened species, but also other endangered species of the grasslands / open forest eco-systems, some of which are on the brink of extinction.

The Task Force has been constituted to:

- Review, progress and monitor the health status of Cheetah, upkeep of the quarantine & soft release enclosures, protection status of entire area, adherence to the defined protocols by forest & veterinary officials and advice on Cheetah introduction in India to the Madhya Pradesh Forest Department and NTCA on status of Cheetah with respect to overall health, behavior and their upkeep.
- Monitor hunting skills and adaptation of Cheetahs to the habitat of Kuno National Park.
- Monitor release of Cheetah from Quarantine bomas to soft release enclosures and then to grass land and open forest areas.
- Open Cheetah habitat for eco-tourism and suggest regulations in this regard.
- Suggest and advice on development of tourism infrastructure in the fringe areas of Kuno National Park and other Protected Areas.
- Regularly interact with Cheetah mitras and local communities for their awareness raising and also involvement in protection of Cheetahs in particular & area in general.

4. Indian Railways plans to become Net Zero Carbon Emitter by 2030

❖ **CONTEXT: Indian Railways has adopted an integrated approach for a Green Environment**

- The Government of India, as part of its Nationally Determined Contributions (NDCs), has set a target of 33% emissions intensity reduction, with the transport sector being one of the key sectors with substantial mitigation potential.
- One of the most vital transportation emissions mitigation strategies agreed to by the Government of India was increasing the share of Indian Railways in the movement of freight from the current ~35-36% to 45% by 2030.
- Indian Railways has a major role in contributing India's NDC towards combating Climate Change through several means:
 - To enhance the share of the Railways in the overall land based freight transport from present 36% to 45% by the year 2030.
 - Indian Railways is setting up Dedicated Freight Corridors (DFCs) across the country. The first phase of the project alone is estimated to reduce emissions by about 457 million ton CO₂ over a 30 year period.
 - Increase the share of renewable energy in its energy mix.
 - Railways to further improve its energy efficiency for both diesel and electric traction thereby facilitating the reduction of GHG emissions for the country.
 - Perform Achieve and Trade (PAT) Scheme to be implemented in railway sector.
 - Use of 5% blending of biofuels in traction diesel fuel.
 - Improve water use efficiency by 20% upto 2030.
 - Tree plantation to increase Carbon sink.
 - Waste Management and Pollution control.
 - Adopting the good practices on Green Buildings, Industrial Units and other establishments for the management of resources and infrastructure to achieve Environmental Sustainability in growth of IR.
 - Contribution in "Swachh Bharat Mission".
 - IR has set a target of becoming a "Net Zero" entity by 2030 by completing electrification of all railway tracks.
- Indian Railways has taken steps to streamline its initiatives with regards to environmental management, with some notable initiatives including Energy Efficiency Management, Renewable and Alternate sources of Energy, Water conservation, Afforestation, Water Management and Green Certifications.

❖ **The reforms undertaken by Indian Railways since 2014 can be broadly categorized in following areas:**

• **Net-Zero Carbon Emission:**

- IR has planned to gradually reduce its carbon footprint and become Net Zero Carbon Emitter by 2030. IR will attempt to reduce its carbon footprint primarily through sourcing of its energy requirements from renewable energy sources. By 2029-30, expected requirement of installation of renewable capacity would be about 30 GW. IR has installed 142 MW solar rooftop capacity and 103.4 MW of Wind energy till August, 2022.
- Other strategies towards Net Zero emitter includes taking a multi-pronged approach of Electrification of its routes, shifting from diesel to electric traction, promotion of energy efficiency, construction of Dedicated Freight Corridors, Green certification of Railway Establishments etc.
- IR has electrified 52,508 RKM out of total BG network of 65,141 RKM (80.61%).
- With 100% electrification, the demand for electricity will go up to about 72 BUs by 2029-30 from 21 BUs in 2019-20. Carbon emission by 2029-30 as per Business As Usual mode is estimated to be 60 million tons which would be offset by various measures planned by IR.

• **Issuance of Water Policy 2017 for effective water management:**

- Water Policy 2017 has been issued to all Zonal Railways and Production Units for implementation in Railway Stations, Trains, and Railway Colonies etc.

- This is a part of overall efforts to achieve 20% reduction in water consumption by 2020 by the Government of India as part of Nationally Determined Contribution.
- Main objective of this policy are to improve water use efficiency by effective demand and supply management, installing water efficient systems and setting up Water Recycling Plants on railway land.
- **Creation of Additional Carbon sink by Afforestation**
 - Afforestation on vacant railway land and in between sections is carried out by Railway departmentally. In pursuance of Railways' commitment towards environmental improvement and sustainable development, Forest Departments of States are being involved in plantation as well as maintenance and disposal of trees.
 - IR has been planting around 1 crore trees annually since 2017 onwards. 72 lakh saplings have been planted during the year 2021-22.
- **Waste Management:-**
 - Waste to energy/compost/biogas plants/Material recovery facility have been set at more than 250 stations to manage waste. Separate bins have been provided for dry and wet waste for waste segregation at source.
- **Green certification/Consent to operate from State Pollution Control Board since 2015**
 - Around 700 Railway Stations have been certified for implementation of Environment Management System to ISO:14001
 - More than 545 stations have achieved Consent to operate (CTO) from respective State Pollution Control Board.
 - 31 railway buildings (including offices, training institutes, hospitals and schools), 32 stations and 55 workshops/PUs have achieved green certification.
- Policy for allocating 1% cost in all sanctioned Works for executing environment related works:-
- Cleanliness of Trains & Railway Stations
- Environment friendly Bio-Toilets for Passenger Coaches:
 - Environment-friendly Bio-toilets for passenger coaches have been developed by Indian Railways (IR) jointly with Defence Research & Development Organization (DRDO).
 - 9,587 bio-toilets were fitted in 3,647 coaches up to March 2014. With the installation of 2,58,990 bio-toilets in nearly 73,110 coaches up to March 2021, the work of fitment of bio-toilets in all the passenger carrying coaches, running on Indian Railways has been successfully completed.
 - The direct discharge of human waste from trains has thus been eliminated in line with 'Swachh Bharat Mission'.
- Third Party audit cum survey on cleanliness of major stations started in 2016 and carried out again in 2017, 2018 and 2019. First ever Third Party audit cum survey on cleanliness of important trains was carried out in 2018.
- Standard Bid Document for Housekeeping of Stations and Trains & General Conditions of Contract for Services

ANSWER WRITING

Q. Differentiate the causes of landslides in the Himalayan region and Western Ghats.

A landslide is defined as the movement of a mass of rock, debris, or earth down a slope. They are a type of mass wasting, which denotes any downward movement of soil and rock under the direct influence of gravity. Landslides are caused due to three major factors: geology, morphology, and human activity.

Causes of landslides in Himalayan region:

- Geology: Himalayas are young, fragile mountains still growing, hence susceptible to natural landslides, tectonic activity, with the plate moving up which causes instability.
- Morphological: Steep and sharp slope in the Himalayas.
- Anthropogenic: These include, jhum cultivation, deforestation etc., leading to landslides.

Causes of landslides in Western Ghats:

- Geology: These factors play a very little role here as the Western Ghats are one of the most stable landmasses.
- Anthropogenic: Heavy mining activities, deforestation for settlements and cutting for road construction, windmill projects have led to huge fractures on the mountains, loosening structures.

Following measures for the mitigation of landslides can be taken:

- Restriction on the construction and other developmental activities such as roads and dams in the areas prone to landslides.
- Limiting agriculture to valleys and areas with moderate slopes.
- Promoting large-scale afforestation programmes and construction of bunds to reduce the flow of water.

Terrace farming should be encouraged in the north-eastern hill states where Jhumming (Slash and Burn/Shifting Cultivation) is still prevalent.

MCQs

1. Consider the following countries

1. Iran
2. Iraq
3. UAE
4. Qatar
5. USA
6. Russia

Which of the above countries are parts of OPEC or OPEC+?

- a) 1,2,3,6 b) 2,3,4,6 c) 1,3,4,5,6 d) 1,2,3,4

2. With reference to Organisation of the Petroleum Exporting Countries OPEC consider the following statements.

1. USA has control over its own production and supply without any interference from the OPEC as it is not part of OPEC.
2. Petrodollars are U.S. dollars paid to an oil-exporting country are the primary source of revenue for many OPEC members.
Choose the correct statement/s using the codes given below
a) 1 only b) 2 only c) **Both 1 and 2** d) Neither 1 nor 2
3. The Union government has formed a Commission to examine whether the Scheduled Caste (SC) status can be accorded to Dalits who have over the years converted to religions other than Sikhism or Buddhism is headed by which of the following?
a) H J Kania
b) Meher Chand Mahajan
c) Ranjan Gogoi
d) **K.G. Balakrishnan**
4. Consider the following statements with reference to Perform Achieve and Trade (PAT) Scheme
 1. The scheme is a flagship programme of Ministry of Environment and Climate Change under the National Mission for Enhanced Energy Efficiency (NMEEE).
 2. NMEEE is one of the eight national missions under the National Action Plan on Climate Change (NAPCC).
 Select the correct statement/s using the codes given below
a) 1 only b) **2 only** c) Both 1 and 2 d) Neither 1 nor 2
5. With reference to bio-toilets used by the Indian Railways, consider the following statements:
 1. The decomposition of human waste in the bio-toilets is initiated by a fungal inoculum.
 2. Ammonia and water vapour are the only end products in this decomposition which are released into the atmosphere.
 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**
6. Consider the following statements
 1. The National Tiger Conservation Authority is a statutory body under the Ministry of Environment, Forests and Climate Change.
 2. Satkosia Tiger Reserve comprises four adjoining sanctuaries of central Odisha.
 Which among the following statements is/are correct?
a) **1 only** b) 2 only c) Both 1 and 2 d) Neither 1 nor 2
7. Consider the following statements
 1. India is the largest importer of arms in the Indo-Pacific region
 2. USA is the largest arms supplier to India in the Indo-Pacific region
 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. Sukhna lake often mentioned in news is situated in which of the following state/UTs?
a) Delhi
b) Rajasthan
c) **Chandigarh**
d) Up
9. Recently Indian indigenous sport Mallakhamb competition seen in news, which of the following statement/s is/are correct regards to it?
 1. This is for the first time to be played at the National Games 2022.
 2. The first-ever mallakhamb world championships were held in 2019
 Choose the correct answer using the codes given below
a) 1 only
b) 2 only
c) **Both 1 and 2**
d) Neither 1 nor 2
10. Consider the following statements:
 1. The International Solar Alliance was launched at the United Nations Climate Change Conference in 2015.
 2. The Alliance includes all the member countries of the United Nations.
 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