1. What are the locational factors for the pharmaceutical industry? Discuss with the help of suitable examples.

Demand of the question:

It expects students to mention the locational factors for the pharmaceutical industry with relevant examples for the specific location.

Introduction:

The pharmaceutical industry discovers, develops, produces, and markets pharmaceutical drugs for use as medications to patients. Pharmaceutical industry being a major global economic force relies on production of pharmaceutical drugs in a safe, clean and efficient environment, hence location of pharmaceutical industries are selected accordingly.

Body:

The pharmaceutical industry's operating environment is complex because of economic, political, technical, and social influences within a growing global environment for product development and delivery. Though pharmaceutical industry is a footloose industry (i.e. it does not require specific local resources) following locational factors needs to be considered for the pharmaceutical industry:

- Availability of Raw material: An ideal location is one where the main raw material required to manufacture the product is adequately available. This will ensure regular supply of the material and will reduce the transportation costs. e.g. Indian pharmaceutical industry is located near the western coast of India. The ports on western coast help to import raw materials required for the manufacturing of drugs.
- Nearness to the potential market: Marketing of finished goods efficiently is an important function of an enterprise. If the plant is located near the market, then the management can keep close touch with their changes in market environment and formulate its production policies accordingly. Moreover, the transportation and other overhead expenses are reduced. e.g. Indian pharmaceutical industry is located near the western coast of India. Proximity to ports (Kandla, Bhavnagar etc.) facilitates easy export to Africa, Europe etc.
- Location should be near to source of operating power: For some specific operations in industries, cheap, continuous and adequate power supply is needed. Location of the plant near to the hydel-power situation will provide cheap electricity.
- Supply of labour: Labour is one of the most important inputs in any industrial enterprise. There should be regular and cheap supply of labour, specifically the skilled labour. Also, If there is adequate supply of local labour/unskilled labour near the plant, then naturally it will be available at cheaper rates.
- Transport and communication facilities: Transport is very important for bringing raw materials, fuel from different places, marketing of finished products etc. The region well connected with rail, road, water and air

transport system is considered to be more appropriate for the location of the plants.

- Suitability of land and climate: Sub-soil of the location should be able to support the load likely to be placed on it. Similarly, climatic conditions viz humidity, temperature and other atmospheric conditions should be favourable for the plant. For example, humid atmosphere is not suitable for the formation of pharmaceuticals.
- Local building and state policy regulations: Proposed location should not be infringe local regulations and bye-laws. Laws for the construction of buildings, local taxes etc. should be taken into consideration for the selection of site. Favourable state government policies also influence the location of industries, e.g. stable policies of Gujarat, Maharashtra.
- Safety requirements: Industries likely to cause pollution or processes explosives in nature should be located in remote areas.

Considering these locational factors, Indian pharmaceutical industry is located near the western coast where raw material is available, also it is well connected to the market through rail, water, road and air. Also highly skilled as well as unskilled workforce is available.

Conclusion:

The pharmaceutical industry has grown in the last several decades and has become quite complex, promising to deliver valuable products that enhance the quality of life to an expanding global population that demands greater access and more affordable choices. Being the pharmacy of the world, India has shown its potential to be the leading producer in the pharmaceutical industry, with more enhancement in it India can prove to be a global leader in the pharmaceutical industry.

2. During the COVID-19 pandemic, we have witnessed significant shifts in the pattern of investments across the world. Please discuss a few examples along with their causative factors.

Demand of the question:
It expects students to observe and mention the shift in pattern of investment across the world with relevant examples. It also expects to discuss the reasons for the shift.

Introduction:
As per World economic situation and prospectus 2020 of United Nations Conference on Trade and Development (UNCTAD), it is observed that the economic uncertainty sparked by the Covid-19 will likely cost the global economy $1 trillion in 2020.

Body:
Almost all the sectors of the economy are devastated by the COVID-19 impact, in these uncertain times investors chose a durable and safe way to ensure return on investment. Hence, investment patterns changed across the world as follows:

- Investors across the world chose to invest in the most dependable options to invest such as investment in the high value metals is increased in such a way that the prices of gold and silver are skyrocketed.
- For instance, gold touched around 56000 rs. for 10gm and silver cost touched nearly 75000 rs mark for 1kg.
- Industrialists in Europe are re-locating their businesses to South Asian countries like India, Vietnam, etc.
- As health becoming the most important issue in this pandemic, people are investing more in buying medical/health insurances. For instance, Health insurance sector saw a 7% rise in investment relatively with pre-covid19 times.
- People are investing more in the essential commodities markets related stocks.
- Also investment in the E-commerce sector has increased, as people are preferring to stay at home and avoid going out.
- For the first time in the history of the Indian capital markets, Foreign Portfolio Investors (FPIs) have sold securities worth over ₹1 lakh crore in a single month (March 2020).
- Investors also chose to invest in the medical health related product manufacturing and services. e.g. Boom of sanitizer and mask manufacturers is seen across the globe as it was the need of the hour.

Following are the major causative factors for change in investment pattern across the world:

- As COVID-19 infection spreads fast has potential to spread millions of people within less span of time, no medication or vaccine for it has halted all the economic activities as health of people is of prime most importance. Hence, change in investment pattern is observed due to uncertainty of market recovery.

- According to market participants, the ongoing COVID-19 pandemic that has affected stocks worldwide is the primary reason for such record outflows as foreign investors move away from riskier assets and emerging markets.
- The global economic slowdown due to the supply chain disruption and market forces at halt has caused the loss of trust of investors in the earlier traded securities.
- Interest rates: Investment is financed either out of current savings or by borrowing. Therefore investment is strongly influenced by interest rates. High interest rates make it more expensive to borrow. High interest rates also give a better rate of return from keeping money in the bank. As in these uncertain times where people are utilising their hard earned savings for survival, the investment choices of people have changed radically.
- Economic growth: Firms invest to meet future demand. If demand is falling, then firms will cut back on investment. If economic prospects improve, then firms will increase investment as they expect future demand to rise. As COVID-19 has impacted the world economy investors are not willing to take risk, as global economic recovery is far in sight.
- Productivity of capital : Even though if an investor chose to invest in the production process, the profit margin from the investment is not sure and hence, less or no investment is taking place.
- Government policies: Government policy of making containment zones and not allowing interstate , intra-state movement and transport has halted the production capabilities.

Although, it will be unreal to expect the investment trajectory to move upwards very easily post-covid19 crisis, following measures can be implemented to normalise the investment pattern:

- Need of the moment is to expedite the development of vaccine for COVID-19, and swift and wide scale availability of the economy across the globe. So, that people can start their all their works in normal situation.
- A large scale fiscal stimulus for the economies to go back to the earlier market transactions is the need of hour.
- Also customization of approach are also needed as different sectors of economy have impacted differently.
- Issues with the banking sectors are also needed to be tackled. Such as NPA's issues may aggravate the crisis in economy.
- Also providing lucrative investment opportunities for business persons and institutions so that their trust can be rebuild in the economy and further economic progress can be achieved.

Conclusion:

Impact of COVID-19 is unprecedented and the downside is that it has affected almost all the sectors of the economy in a single shot. However, the upside is expedited vaccine development for COVID-19 shows some promising results. Hence, necessary steps needed to be taken as early as possible which will supplement the recovery of economy.

3. How are sustainable technologies shaping the economies of different countries? Discuss. What is the level of maturity of this industry in India? Examine.

Demand of the question:

It expects students to write about the sustainable technologies role in shaping economies of different countries. It also expects to probe deeper in to facts of the level of maturity of this industry in India.

Introduction:

People and their well-being are often the central focus of many scientific and technological endeavours. Sustainable Technology is a technology which improves our social and environmental footprint at every stage of the product life, from raw material extraction to end of life.

Body:

Attesting to this, Sustainable technologies are generating breakthroughs in the field of medicine, electricity, solar power, space exploration, governance, education, construction etc. Sustainable technologies are shaping the economies of different countries in following ways:

- It ensures efficient natural resource consumption.
- The shift from fossil fuel toward perpetual energy takes place, hence, its relative negative impacts such as pollution like problems are minimized.
- Climate change risk mitigation: Being sustainably conscious, Patagonia has implemented a number of innovations in company management, such as recycled construction materials with laminated coated windows that prevent overheating, LED lighting, new systems of heating, ventilation and air conditioning controlled by a smart grid.
- Supply chain improvement: Walmart, one of the biggest retail corporations in USA represents multiple deployments of digital transformations that work to eliminate wastage and energy usage and to provide supply chain control.
- Patagonia is a sustainable clothing company with $800 million revenue that can boast with using organic materials, selling worn and re-crafted outfits and organic provision. Also, the company provides worldwide fundraising through online banking and keeps an online blog The Cleanest Line where articles are dedicated to environmental crises and solutions.
- Digital innovations with help of renewable energy: The implementation of ambiguous digital transformations, like IoT and AL software, can help to control environmental conditions within the city. For example, saving water, especially in limited desert surroundings, becomes accessible due to smart sensors for water management and rainwater collection.
- Offshore wind turbines equipped with sensors that seamlessly generate valuable data used to build “an entirely green connection” with a 100 % carbon-free energy supplement by 2025. e.g. As done in Denmark by Microsoft and Orsted.

In these versatile ways sustainable technologies are shaping the economies of the world. These technologies are not just shaping the economies but they are transforming these economies into a different era of technological evolution.

Level of maturity of Sustainable technology industry in India:

- From the point of view of government initiatives, Centre for Sustainable Technologies (CST) established as Centre for ASTRA (Application of Science and Technology for Rural Areas) in 1974, is IISc inter-disciplinary research and technology development centre for providing sustainable solutions to host of global concerns.
- CST's diverse interventions are, Energy Efficient Wood Burning Devices, Biomethanation, Biomass Gasification, Alternative Building Technologies, Green Buildings and BiPV, Water Purification and Defluoridation, Sanitation, Sustainable Biomass for Energy, Forestry, Bioenergy & Climate Change, and Environmental Quality Assurance-Impact Studies.
- The spread and impact of technologies emanating from CST over the past three decades have been noteworthy; 1.5 million rural households are using the ASTRA wood burning devices for their cooking needs, adoption of biomass gasifiers for village electrification and industries is resulting in a daily savings of about 30 tons of fossil fuel.
- Thirty-five biomethanation plants are converting bio-waste into useful biogas and about 12,000 buildings (including 5000 in earthquake affected regions of Gujarat) have been built using alternate building materials developed.
- In agriculture sector, we identify some of the more promising technologies are developed that have the potential to transform agriculture, especially on small holding farms in India, to a low carbon and climate resilient path while maintaining or increasing yields.
- In grid connectivity, The major objective of 'Smart grid mission for India' is to empower the Indian power sector in deploying smart grid sustainable technologies in an efficient, cost effective, innovative and scalable manner by bringing together all enabling technologies and all key stakeholders together under one roof.
- The Government of India has set a target of installing 175 GW of renewable energy capacity by the year 2022, which includes 100 GW from solar, 60 GW from wind, 10 GW from bio-power and 5 GW from small hydro-power. Also International Solar Alliance as proposed by India is in place on global forum.
- India’s renewable power installed capacity has reached over 70 GW. Here the sustainable technologies have achieved a considerable target but still miles to go to achieve the set target.

The challenges of sustainable technological development is different in different settings, considering Indian scenario India has initiated and achieved noteworthy heights in sustainable technological development. However, following approaches needs to be adopted to attain heights of excellence.

- Investing more in research and development in the sustainable technological development sector.

- Giving impetus to new ideas and imbibing a culture of scientific approach in students through missions such as Atal innovation mission.
- Supporting the start-ups in the sustainable technological sector by providing them tax concessions, less interest loans and providing platform for the market exposure such as green technological expo.

Conclusion:

Sustainable technology is a newly emerging field in the world economy. As the fossil fuels are limited in nature, emerging sustainable technologies are going be the game changer in the market. Hence, more emphasis on developing these technologies can ensure India to achieve great heights in sustainable technological development just like ISRO's golden achievements in past years.