

MANUFACTURING INDUSTRIES

This chapter focuses mainly upon the manufacturing activities that various industries of the country indulge in. Production of goods in large quantities after processing from raw materials to more valuable products is called manufacturing. Manufacturing industries help drive the economy of the country and are responsible for the country's prosperity.

It also talks about different kinds of industries- their classification with examples.

Environmental degradation and pollution as a consequence of these industries has also been discussed along with suggestions on how to prevent them.

TOPIC 1

MANUFACTURING

Production of goods in large quantities after processing from raw materials to more valuable products is called manufacturing. Paper is manufactured from wood, sugar from sugarcane, iron and steel from iron ore and aluminum from bauxite. Some types of clothes are manufactured from yarn which is an industrial product.

People employed in the secondary activities manufacture and process the primary materials into finished goods. This sector includes workers employed in steel factories, cars, breweries, textile industries, bakeries etc.

The economic strength of a country is measured by the development of manufacturing industries. Manufacturing sector is the backbone of country's development because:

- (1) Manufacturing industries modernise agriculture and reduce the heavy dependence of people on agricultural income since it provides jobs in the secondary and tertiary sectors.
- (2) Industrial development is a precondition for eradication of unemployment and poverty from India. This became the underlying philosophy of public sector industries and joint sector ventures in India. It also helps in reducing the regional disparities by establishing industries in tribal and backward areas.

(3) Export of manufactured goods expands trade and commerce and helps bring in foreign exchange.

(4) Manufacturing products from raw materials brings prosperity to a country. India's prosperity lies in increasing and diversifying its manufacturing industries quickly.



Frequently Asked

➤ *Agriculture and industry move hand in hand and are inclusive of each other. Agro-industries in India raise the productivity of agriculture. Agro-industries depend upon agriculture for raw materials and also sell their finished products such as irrigation pumps, fertilisers, insecticides, pesticides, plastic and PVC pipes, machines and tools, etc. to the farmers.*

Development and competitiveness of the manufacturing industry has helped agriculturists in increasing their production, also making the production processes very efficient.

Our industry needs to be more efficient and competitive apart from being self sufficient. To compete with international markets, goods manufactured by our industries must be of equal standards to those produced in international markets.

MOST LIKELY Questions

Very Short Answer Type Questions

[2 marks]

1. **Agriculture and industry are not exclusive to each other. What does the given statement mean?**

Ans. Agriculture and industry cannot develop or exist individually. Their development is integrated and development of each sector augments the development of the other. In

other words, each of them are dependent upon the other for its existence and development.



Related Theory

➤ *Agricultural products are primary sector goods. They are processed and turned into finished goods by the manufacturing sector. The sectors are both interconnected and cannot develop individually because the products of one sector become the raw material for another sector. Hence, they always go hand in hand.*

Short Answer Type Questions (SA)

[3 marks]

2. Explain with examples, how do industries give a boost to the agriculture sector?

Ans. The agro-industries give a major boost to agriculture by raising its productivity:

- (1) These industries supply irrigation pumps, fertilizers, insecticides, pesticides, plastic and PVC pipes, machines and tools, etc. to the farmers which helps them grow more food.
- (2) Industries help in transporting the goods produced.
- (3) Manufacturing industries help in modernising agriculture. They reduce the heavy dependence of people on agricultural income by providing them jobs in secondary and tertiary sectors.

3. Describe the importance of manufacturing industries as a backbone of economic development of the country.

OR

Explain with examples the interdependence of agriculture and industries.

Ans. The manufacturing sector is considered as the backbone of economic development of a country because:

- (1) The manufacturing sector provides employment to a large number of people in the industrial as well as service sectors.
- (2) It helps in increasing agricultural productivity by modernising agriculture.
- (3) It also helps in minimising regional disparities by setting up industries in tribal and backward areas of the country.

(4) It leads to the economic development of the country by getting foreign exchange in return of trading goods.

(5) It also leads to the expansion of trade and commerce.

(6) It helps in the transformation of raw materials into furnished goods that are higher in price and value.

(Any 3 of 6 points can be written to get full marks)



Related Theory

- Agriculture and industries go 'hand-in-hand' and are interdependent on each other because industries produce many things like insecticides and pesticides for agriculture and they in turn use agricultural goods as their raw material.
- The manufacturing sector contributes widely to the economy of the country. The trend of growth rate in manufacturing over the last decade has been around 7% per annum.

Long Answer Type Questions (LA)

[5 marks]

4. Agriculture and industry are complementary to each other? Explain with five examples.

Ans. (1) Agro industries in India have given a major boost to agriculture by raising its productivity.

(2) Industries depend on agriculture for their raw materials.

(3) Industries sell that products such as irrigation pumps, fertilisers, etc. to the farmers.

(4) Industries have made the production processes of agriculture very efficient.

(5) Agriculture provides a huge market and consumer base for the industrial products.

TOPIC 2

CONTRIBUTION OF INDUSTRY TO NATIONAL ECONOMY

In the recent past, the manufacturing sector has stagnated at 17 per cent of GDP – out of a total of 27 per cent for the industry which includes 10 per cent for mining, quarrying, electricity and gas.

In some East Asian economies, this figure is 25-35 per cent. Growth rate in manufacturing over the last decade has been around 7 per cent per annum as opposed to the desired growth rate for the next decade is 12 per cent.

Since 2003, the manufacturing sector has been growing at the rate of 9-10 per cent per annum. With appropriate policy interventions by the government and renewed efforts by the industry to improve productivity, economists predict that manufacturing can achieve this growth by next decade.



Important

- The National Manufacturing Competitiveness Council (NMCC) has been set up to improve the productivity of the manufacturing sector.

- (2) **Availability of cheap labour:** Industries are generally located in close proximity to highly populated regions which become easy and inexhaustible sources of cheap labour.
- (3) **Availability of capital:** Money or capital is an essential factor needed without which production is not possible. Thus, banking facilities help provide capital to the investor in the form of loans.

- (4) Availability of uninterrupted power supply.
- (5) Availability of market to sell goods made in industries, with easy transportation and communication facilities are also very important for location of an industry.
- (6) **Availability of Water:** Water is one of the major things required in any industry. It is very important in deciding an appropriate location.

(Any 5 of 6 points can be written to get full marks)

TOPIC 4

CLASSIFICATION OF INDUSTRIES

Industries may be classified as follows:

- (1) On the basis of source of raw materials used:
- **Agro Based Industries:** Cotton, woolen, jute, silk textile, rubber and sugar, tea, coffee, edible oil.
 - **Mineral Based Industries:** Iron and steel, cement, aluminium, machine tools, petrochemicals.
- (2) On the basis of their main role:
- **Basic or Key Industries:** Supply their products or raw materials to manufacture other goods e.g. Iron and Steel and copper smelting, aluminum smelting.
 - **Consumer Industries:** Produce goods for direct use by consumers – sugar, toothpaste, paper, sewing machines, fans etc.
- (3) On the basis of capital investment:
- **Small Scale Industry:** Maximum investment allowed on the assets of a small scale industry unit is 1 crore. This limit keeps changing over a period of time.
 - **Medium Scale Industry:** When the overall investment is more than Rs. 5 crores, and also less than Rs. 10 crores.
 - **Large Scale Industry:** When the overall investment is more than Rs. 10 crores.
- (4) On the basis of ownership:
- **Public Sector:** Owned and operated by government agencies – BHEL, SAIL etc.
 - **Private Sector:** Owned and operated by an individual or a group – TISCO, Bajaj Auto Ltd., Dabur Industries.
 - **Joint Sector:** These industries are jointly run by the state and individuals or a group of individuals. Oil India Ltd. (OIL) is jointly owned by the public and private sector.
 - **Cooperative Sector:** Owned and operated by the producers or suppliers of raw

materials, workers or both. They pool in the resources and share the profits or losses proportionately. For example, sugar industry in Maharashtra, coir industry in Kerala.

- (5) Based on the bulk and weight of raw material and finished goods:
- **Heavy Industries:** Heavy raw materials used are Iron and Steel.
 - **Light Industries:** Light raw materials and produce light goods such as electrical industries.

Agro-Based Industries

Cotton, jute, silk, woolen textiles, sugar and edible oil, etc. industries are based on agricultural raw materials.

Textile Industry

The textile industry occupies a unique position in the Indian economy. It contributes significantly to industrial production (14 per cent), employment generation (about 35% people are employed-second largest employer after agriculture) and foreign exchange earnings (about 24.6 per cent). It contributes 4 per cent towards GDP.



Frequently Asked

➤ *The textile industry is the only industry in the country that is self-reliant and complete in the value chain. The process is a complete chain from raw material to the highest value added products.*

Cotton Textiles

In ancient India, cotton textiles were produced with hand spinning and handloom weaving techniques.

Power-looms came into use after the 18th century.

Competition with the mill-made cloth from England led to destruction of native industries.

Spinning is still centralised in Maharashtra, Gujarat and Tamil Nadu but weaving is highly decentralised

MOST LIKELY Questions

Very Short Answer Type Questions

[2 marks]

5. Why has the 'National Manufacturing Competitiveness Council' been set up?

Ans. The NMCC was created to improve the growth rate in the manufacturing sector through policy interventions.

Long Answer Type Questions (LA)

[5 marks]

6. What is the manufacturing sector? Why is it considered the backbone of development? Interpret the reason.

Ans. Definition of Manufacturing Sector:

Production of goods in large quantities after processing from raw materials to more valuable products is called manufacturing.

It is considered as backbone of development because:

- (1) It not only helps in modernising agriculture but also forms the backbone of our economy.
- (2) Industrial development is a precondition for eradication of unemployment and poverty from our country.
- (3) Export of manufactured goods expands trade and commerce.
- (4) Countries that transform their raw materials into a wide variety of finished goods of higher value are prosperous.
- (5) Any other relevant point.

TOPIC 3

INDUSTRIAL LOCATION

Industrial locations are complex in nature and influenced by availability of raw material, labour, capital, power and market, etc. All factors are hardly found at every location. Manufacturing activity is generally located at places where all the factors of industrial location are either available or can be arranged at lower cost. Urbanisation follows industrial activity. Industries are located either close to or in cities.

Industrialisation and urbanisation go hand in hand.

Cities provide markets and services such as banking, insurance, transport, labour, consultants and financial advice, etc. to the industry.



Frequently Asked

↳ Many industries tend to come together to make use of the advantages offered by the urban centres known as agglomeration economies. This is how a large industrial agglomeration takes place.

Before Independence, most manufacturing units were located in Mumbai, Kolkata, Chennai, etc. for their closeness to the sea. There emerged certain pockets of industrially developed urban centres surrounded by a huge agricultural rural hinterland.

The key to decision of the factory location is the least cost. Government policies and specialised labour also influence the location of industry.

MOST LIKELY Questions

Very Short Answer Type Questions

[2 marks]

7. Why is the 'least cost' known as a decision making factor for ideal location of an industry?

Ans. The cost is the most important factor and has to be least to maximise profit. The place with least cost is the most decision making factor to choose an ideal location.

Long Answer Type Questions (LA)

[5 marks]

8. Explain the factors which are responsible for location of industries.

Ans. Factors responsible for location of industries are:

- (1) **Easy availability of raw material:** Industries are located close to a place where uninterrupted, easy and cheap sources of raw material are found along with fast and easy transportation.

to help incorporate traditional skills and designs of weaving in cotton, silk, zari, embroidery, etc.

India has world class production in spinning, but weaving supplies low quality of fabric. Indian weavers do not use much of the high quality yarn produced in the country.

Weaving is done by handloom, powerloom and in mills.

Handspun khadi provides employment to weavers in their homes as a cottage industry.



Important

➤ The first successful textile mill was established in Mumbai in 1854.

When the two world wars were fought in Europe, India was a British colony. There was a demand for cloth in U.K. hence, they gave a boost to the development of the cotton textile industry.

British introduced cotton textile industries in India for their selfish purposes in the 19th century. By 2011, 1946 cotton and human-made fibre textile mills have been established in the country.

80 per cent of the mills have been established in the private sector and the remaining 20% in public and cooperative sectors. There are several thousand small factories with four to ten looms.

Earlier, the cotton textile industry was concentrated in the cotton growing belt of Maharashtra and Gujarat. The factors that contributed towards their localisation are availability of raw cotton, market, transport including accessible port facilities, labour, moist climate, etc. This industry provides employment to farmers, cotton boll pluckers and workers engaged in ginning, spinning, weaving, dyeing, designing, packaging, tailoring and sewing. The industry supports industries like chemicals and dyes, mill stores, packaging materials and engineering works and creates great demands.

It is important for our country to keep the mill sector loomage lower than power loom and handloom.



Frequently Asked

➤ India exports yarn to Japan, the U.S.A., the U.K., Russia, France, East European countries, Nepal, Singapore, Sri Lanka, and African countries are other importers.

India has the second largest installed capacity of spindles in the world, with 43.13 million spindles (2011-12) after China. The spinning sector has received attention since the 1980s.

Indian produce accounts for one fourth of the total world trade of cotton yarn. We only contribute 4% in the world trade of textiles. Our spinning mills are competitive at the global level and capable of using all the fibres we produce.

Weaving, knitting and processing units cannot use much of the high quality yarn produced in the country. Most production is in fragmented small units, which cater to the local market.

This is a drawback for the industry. Consequently, many of our spinners export cotton yarn while apparel/garment manufacturers have to import fabric.

Challenges: Major challenges are:

- (1) Despite an increase in the production of good quality long staple cotton (356 lakh bales of 170 kgs annually 2011-12), the need of importing materials is felt frequently.
- (2) Power supply is erratic.
- (3) Machinery needs to be upgraded in the weaving and processing sectors.
- (4) Low output of labour.
- (5) Stiff competition with the synthetic fibre industry.

Jute Textiles

India is the largest producer of raw jute and jute goods. It is the second largest exporter of jute goods after Bangladesh. By 2010-11, there were 80 jute mills in India. Majority mills are located in West Bengal.



Important

➤ The first jute mill was set up near Kolkata in 1859 at Rishra.

After partition of 1947, three-fourth of the jute producing area went to Bangladesh (erstwhile East Pakistan) while Jute mills remained in India.

The following factors responsible for their location in the Hugli basin are:

- (1) Proximity of the jute producing areas.
- (2) Inexpensive water transport.
- (3) Good network of railways, roadways and waterways to facilitate movement of raw material to the mills.
- (4) Abundant water for processing raw jute, cheap labour from West Bengal and adjoining states of Bihar, Orissa and Uttar Pradesh.



Frequently Asked

➤ Kolkata as a large urban centre provides banking, insurance and port facilities for export of jute goods.

The Jute industry supported 3.7 lakh workers and 40 lakhs small and marginal farmers engaged in cultivation of jute in 2010-11.

Challenges: Challenges faced by the industry include:

- (1) Stiff competition from various synthetic substitutes and competitors like Bangladesh, Brazil, Philippines, Egypt and Thailand.
- (2) Internal demand has increased owing to the government policy of mandatory use of jute packaging.
- (3) Products need to be diversified to stimulate demand.

Aluminium smelting plants in the country are located in Odisha, West Bengal, Kerala, Uttar Pradesh, Chhattisgarh, Maharashtra and Tamil Nadu. India has produced over 15.29 lakh million tonnes of aluminium in 2008-2009.

Bauxite used as a raw material in the smelters is a very bulky, dark reddish coloured rock. Regular supply of electricity and fixed and reliable source of raw material at minimum cost are the two prime factors for location of the industry.

Chemical Industries

The chemical industry is growing and diversifying quickly in India. It contributes approximately 3 per cent of the GDP. Indian chemical industry is the third largest in Asia and twelfth largest in the world in terms of size.

It comprises both large and small scale manufacturing units.

Rapid growth has been recorded in both inorganic and organic sectors. Inorganic chemicals include sulphuric acid (used to manufacture fertilisers, synthetic fibres, plastics, adhesives, paints, dyes stuffs), nitric acid, alkalies, soda ash (used to make glass, soaps and detergents, paper) and caustic soda. They are found widely spread over in the world.

Organic chemicals include petrochemicals for manufacture of synthetic fibers, synthetic rubber, plastics, dye-stuffs, drugs and pharmaceuticals. Organic chemical plants are located near oil refineries or petrochemical plants.



Frequently Asked

- ↳ The chemical industry is its own largest consumer.
- ↳ Basic chemicals undergo processing and produce chemicals used for industrial application, agriculture or directly for consumer markets.

Fertiliser Industry

The fertiliser industry is centred around the production of nitrogenous fertilisers (mainly urea), phosphatic fertilisers and ammonium phosphate (DAP) and complex fertilisers which have a combination of nitrogen (N), phosphate (P), and potash (K). Potash is entirely imported as the country does not have any reserves of commercially usable potash or potassium compounds in any form.

India is the third largest producer of nitrogenous fertilisers. There are 57 fertiliser units which manufacture nitrogenous and complex nitrogenous fertilisers, 29 of which manufacture urea and 9 for producing ammonium sulphate as a byproduct. 68 small units produce single superphosphate.



Important

- ↳ There are 10 public sector undertakings and one in cooperative sector at Hazira in Gujarat under the Fertiliser Corporation of India.

The industry has expanded to other parts of the country post Green Revolution.

Gujarat, Tamil Nadu, Uttar Pradesh, Punjab and Kerala contribute towards half the fertiliser production. Andhra Pradesh, Odisha, Rajasthan, Bihar, Maharashtra, Assam, West Bengal, Goa, Delhi, Madhya Pradesh and Karnataka contribute the other half.

Cement Industry

Cement is useful in activities like building houses, factories, bridges, roads, airports, dams and other commercial establishments. Raw materials like limestone, silica, alumina and gypsum are required by this industry. Coal and electric power are needed apart from rail transportation.



Important

- ↳ The industry has strategically located plants in Gujarat with suitable access to the market in the Gulf countries.
- ↳ The first cement plant was set up in Chennai in 1904.

The cement industry expanded after Independence. Decontrol of price and distribution since 1989 coupled with other policy reforms led the cement industry to make rapid strides in capacity, process, technology and production. There are 128 large plants and 332 mini cement plants in the country. India produces a variety of cement.

East Asia, Middle East, Africa and South Asia have welcomed the new improved quality of cement apart from a large demand within the country. This industry is doing well in terms of production as well as export. Efforts to boost domestic demand and supply in order to sustain this industry are being pondered upon.

Automobile Industry

Automobiles like trucks, buses, cars, motor cycles, scooters, three-wheelers and multi-utility vehicles are manufactured in India at various centres. After the liberalisation, advancement in form of contemporary models stimulated the demand for vehicles in the market, which in turn led to growth of the industry including passenger cars, two and three wheelers.

Automobile industry has grown exponentially in the last 15 years. Foreign Direct Investment brought in new technology and aligned the industry with global developments. The industry is located around Delhi, Gurgaon, Mumbai, Pune, Chennai, Kolkata, Lucknow, Indore, Hyderabad, Jamshedpur and Bengaluru.

Information Technology and Electronics Industry

This industry covers transistor sets to television, telephones, cellular telecom, pagers, telephone exchange, radars, computers and many other



Important

➤ In 2005, the National Jute Policy was formulated to increase productivity, improve quality, ensure good prices to the jute farmers and enhance the yield per hectare.

U.S.A., Canada, Russia, Saudi Arabia, U.K. and Australia are the main markets of Jute. Jute is an eco-friendly package material and is proposed to replace plastic as a measure to save the environment.

Sugar Industry

India is the second largest sugar producer in the world. It however occupies the first place in the production of gur and khandasari. Raw material of the sugar industry is bulky and in haulage, its sucrose content reduces. In 2010-11, over 662 sugar mills were spread in Uttar Pradesh, Bihar, Maharashtra, Karnataka, Tamil Nadu, Andhra Pradesh, Gujarat, Punjab, Haryana and Madhya Pradesh.



Important

➤ 60% of the sugar mills are found in Uttar Pradesh and Bihar.

➤ Sugar industry is seasonal in nature and hence ideally suited to the cooperative sector.



Frequently Asked

➤ There is a recent tendency for sugar mills to shift and concentrate in the southern and western states of India, especially in Maharashtra.

➤ This is because the cane produced here has a higher sucrose content.

➤ The cooler climate also ensures a longer crushing season.

Another plus point is that cooperatives are more successful in these states.

Challenges: Major challenges are:

- (1) Seasonal nature of the industry.
- (2) Old and inefficient methods of production.
- (3) Transport delay in reaching cane to factories.
- (4) The need to maximise the use of bagasse.

Mineral Based Industries

Industries that use minerals and metals as raw materials are called mineral-based industries.

Iron and Steel Industry

The Iron and Steel industry is the basic industry since all the other industries — heavy, medium and light, depend on it for their machinery. Steel is needed to manufacture a variety of engineering goods, construction material, defence, medical, telephonic, scientific equipment and a variety of consumer goods.



Frequently Asked

➤ Production and consumption of steel is often regarded as the index of a country's development. Iron and steel is a heavy industry because all the raw materials as well as finished goods are heavy and bulky entailing heavy transportation costs.

Iron ore, coking coal and limestone are required in the ratio of approximately 4 : 2 : 1. Some quantity of manganese is also required to harden the steel.

Finished products need an efficient transport network for their distribution to the markets and consumers. Most of the public sector undertakings market their steel through Steel Authority of India Ltd. (SAIL).



Important

➤ Mini steel plants are smaller, have electric furnaces, use steel scrap and sponge iron. They have re-rollers that use steel ingots as well. They produce mild and alloy steel of various specifications.

➤ An integrated steel plant is large, handles everything in one complex — from putting together raw material to steel making, rolling and shaping.

In the 1950s, China and India produced almost the same quantity of steel. Today, China is the world's largest producer and consumer of steel. In 2004, India was the largest exporter of steel accounting for 2.25 per cent of the global steel trade.

Chottanagpur plateau region has the maximum concentration of iron and steel industries.

This region possesses special advantages for quick development of this industry.

- (1) Low cost of iron ore
- (2) High grade raw materials in proximity
- (3) Cheap labour
- (4) Vast growth potential in the home market

Challenges: India is not able to perform to its full potential in production of Iron and Steel because:

- (1) High costs and limited availability of coking coal
- (2) Lower productivity of labour
- (3) Irregular supply of energy
- (4) Poor infrastructure.

India imports good quality steel from other countries. The overall production of steel is sufficient to meet our domestic demand. Liberalisation and Foreign Direct Investment (FDI) has boosted the industry through the efforts of private entrepreneurs. More allocation of resources for research and development is required to produce steel more competitively.

Aluminium Smelting

Aluminium smelting is the second most important metallurgical industry in India. The metal aluminium is light, resistant to corrosion, a good conductor of heat, malleable and becomes strong when it is mixed like an alloy with other metals. Aluminium is useful to manufacture aircraft, utensils and wires.



Important

➤ Aluminium has gained popularity as a substitute of steel, copper, zinc and lead in a number of industries.

equipment required by the telecommunication industry. Bangalore has emerged as the electronic capital of India. Other important centres are Mumbai, Delhi, Hyderabad, Pune, Chennai, Kolkata, Lucknow and Coimbatore.

By 2010-11, the Software Technology Parks of India have come up across 46 locations at different centres of India. The industry is majorly concentrated in Bangalore, Noida, Mumbai, Chennai, Hyderabad

and Pune. One of the most positive points about this industry is its employment generation. 30 per cent of the people employed in this sector are women. The growing Business Processes Outsourcing (BPO) sector has brought a lot of foreign exchange reserves in the past couple years.

Important

↳ The continuing growth in the hardware and software sector is the key to the success of the IT industry in India.

MOST LIKELY Questions

Very Short Answer Type Questions

[1 mark]

9. Classify industry on the basis of the bulk and weight of raw material and finished goods.

Ans. On the basis of bulk and weight of raw material and finished goods, the industries are classified into:

- (1) Heavy industries: For example, iron and steel.
- (2) Light industries that use light raw materials and produce light goods: For example, electrical industries.

10. Suggest any one way to promote the jute textile industry in India.

Ans. The jute textile industry can be improved by promoting jute packaging/jute products as environment friendly, biodegradable products and viable alternative to synthetic fibres.

11. What is a basic industry?

Ans. An industry which supply its products or raw materials to manufacture other goods is called a basic industry. Example: Iron and steel industry.

Explanation: Basic industries are also known as key industries. For example, aluminum smelting, copper smelting.

12. Name the only industry which is self reliant in its value chain.

Ans. Textile industry is the only industry to be self-reliant and complete in the value chain - from raw material to the final products etc.

13. Suggest measures to promote handspun/ khadi in India.

Ans. The efficiency of the Central Khadi Board should be increased to promote handspun khadi.

Khadi should be infused with modern forms to clothing, accessories and bags to attract customers.

Short Answer Type Questions (SA)

[3 marks]

14. "The iron and steel industry is the basic as well as heavy industry." Support the statement with three points.

Ans. Iron and steel industry is the basic industry as well heavy industry because:

- (1) Other industries depend upon the steel industry for their machinery and equipment.
- (2) Steel helps manufacture a variety of engineering goods.
- (3) It also manufactures consumer goods.
- (4) Construction material, defence, medical, telephonic, scientific equipment are products of the iron and steel industry.

(Mention any 3)

15. Why was the cotton textile industry concentrated in the cotton growing well in the early years? Explain.

Ans. The cotton textile industry was concentrated in the cotton growing belt of Maharashtra and Gujarat. This is because the following facilities were readily available at these local areas:

- (1) Availability of raw cotton in regions.
- (2) Transport including accessible port facilities
- (3) Labour, conducive moist climate etc.

16. Analyse any three major challenges faced by the sugar industry in India.

Ans. Major challenges of sugar industry are as follows:

- (1) Seasonal nature of the industry poses the biggest problem.
- (2) Old and inefficient methods of production hinder the production of sugar.
- (3) Transport delay in reaching sugar factories leads to reduction in its sucrose content.

Long Answer Type Questions (LA)

[4 & 5 marks]

17. Give a brief description of the sugar industry with special reference to its raw material, its nature, location of sugar mills and place in the world.

Ans. (1) **Raw material:** The raw material for this industry is sugarcane.

(2) **Nature:** This industry is seasonal in nature, it needs large manual labour in various processes of cultivation and production of sugar.

(3) **Location of sugar mills:** There are about 460 sugar mills which are located in Uttar Pradesh, Bihar, Maharashtra, Karnataka, Tamil Nadu, Andhra Pradesh, Gujarat, Punjab, Haryana and Madhya Pradesh. Sixty per cent mills are in Uttar Pradesh and Bihar.

18. Explain any five factors that are responsible for the location of the jute mills mainly along the banks of the Hugli River.

Ans. Factors that are responsible for the location of the jute mills mainly along the banks of the Hugli river are:

(1) The proximity of the jute producing areas cuts down the transportation cost.

(2) Low-cost water transport, supported by a good network of railways, roadways and waterways, helps the movement of raw material to the mills.

(3) Presence of abundant water for processing raw jute.

(4) Cheap labour from West Bengal and adjoining states of Bihar, Orissa and Uttar Pradesh helps in cutting down the cost.

(5) Kolkata as an urban centre provides banking, insurance and port facilities for the export of jute goods.

(6) Kolkata port facility is available which helps to transport finished goods to other places easily.

(Any 5 of the 6 points can be written to get full marks)

19. What are software technology parks? State any two of its features.

Ans. Software technology parks provide single window service and high data communication facilities to software experts.

Few features of the Software Technology parks are:

(1) It has exponentially impacted employment generation. The IT industry employs over one million persons.

(2) Software technology parks are located at Bangalore, Noida, Mumbai, Chennai, Hyderabad and Pune.

(3) The continuous growth in the hardware and software is the key to the success of the IT industry in India.

Case Based Questions (VSA Type)

[4 & 5 marks]

20. Read the source given below and answer the questions that follow-

Manufacturing sector is considered the backbone of development in general and economic development in particular mainly because Manufacturing industries not only help in modernising agriculture, which forms the backbone of our economy, they also reduce the heavy dependence of people on agricultural income by providing them jobs in secondary and tertiary sectors. Industrial development is a precondition for eradication of unemployment and poverty from our country. This was the main philosophy behind public sector industries and joint sector ventures in India. It was also aimed at bringing down regional disparities by establishing industries in tribal and backward areas. Export of manufactured goods expands trade and commerce, and brings in much needed foreign exchange. Countries that transform their raw materials into a wide variety of furnished goods of higher value are prosperous. India's prosperity lies in increasing and diversifying its manufacturing industries as quickly as possible.

(A) Why were public sector industries and joint sector ventures created in India? 2

(B) What helps in expansion of trade? 1

(C) What is the criterion for countries to prosper? 1

Ans. (A) Industrial development helps in eradication of unemployment and poverty from our country. Hence these ventures were created to help eradicate poverty.

(B) Export of domestically manufactured goods help in development of industries.

(C) Converting raw materials into a wide variety of furnished goods of higher value contributes to the prosperity of a country.

21. Read the source given below and answer the questions that follow-

India has the second largest installed capacity of spindles in the world, with 43.13 million spindles (2011-12) after China. Since the mid-eighties, the spinning sector has received a

lot of attention. We have a large share in the world trade of cotton yarn, accounting for one fourth of the total trade. However, our trade in garments is only 4 percent of the world's total. Our spinning mills are competitive at the global level and capable of using all the fibres we produce. The weaving, knitting and processing units cannot use much of the high quality yarn that is produced in the country. There are some large and modern factories in these segments, but most of the production is in fragmented small units, which cater to the local market. This mismatch is a major drawback for the industry. As a result, many of our spinners export cotton yarn while apparel/garment manufacturers have to import fabric.

(A) Which country in the world has the largest installed capacity of spindles? 1

(B) How can we say that the Indian textile industry is yet to realise its full potential? 2

(C) What can be a step to enhance the performance of our weaving, knitting and processing units? 1

Ans. (A) China

(B) Our share in the World Trade of garments is only 4 percent as opposed to our contribution of 25 percent in the cotton trade of the world. The Indian textile market can perform better given the easy availability of raw material.

(C) Most of our textile production is done in small fragmented units instead of modern factories. We must remedy this to enhance our performance.

TOPIC 5

INDUSTRIAL POLLUTION AND ENVIRONMENTAL DEGRADATION

Industries might be positive for India's economic growth and development, but they are detrimental for the environment. They increase the pollution of land, water, air, noise. One cannot overlook the degradation industries have caused to the environment. The polluting industries also include thermal power plants.



Frequently Asked

Industries are responsible for four types of pollution:

- | | |
|----------|-----------|
| (1) Air | (2) Water |
| (3) Land | (4) Noise |

Air Pollution

- The presence of a high proportion of undesirable gases like sulphur dioxide and carbon monoxide causes air pollution.
- Airborne particulate materials include solid and liquid particles like dust, spray mists and smoke.
- Smoke is emitted by chemical and paper factories, brick kilns, refineries and smelting plants, and burning of fossil fuels in big and small factories that ignore pollution norms.
- Toxic gas leaks have severe long-term effects. Air pollution adversely affects human health, animals, plants, buildings and the atmosphere as well.

Water Pollution

- Water pollution is caused by organic and inorganic industrial wastes and the effluents discharged into rivers.

- Paper, pulp, chemical, textile and dyeing, petroleum refineries, tanneries and electroplating industries that let out into water bodies dyes, detergents, acids, salts and heavy metals like lead and mercury pesticides, fertilisers, synthetic chemicals with carbon, plastics and rubber, etc.
- Fly ash, phospho-gypsum and iron and steel slags are the major solid wastes in India.

Thermal Pollution

- Thermal pollution of water is when the hot water from factories and thermal plants is drained into rivers and ponds before cooling.
- Wastes from nuclear power plants, nuclear and weapon production facilities cause cancers, birth defects and miscarriages.
- Soil and water pollution are caused by the same effluents.
- Dumping of wastes specially glass, harmful chemicals, industrial effluents, packaging, salts and garbage renders the soil useless.
- Rain water percolates to the soil carrying the pollutants to the ground and the groundwater also gets contaminated.

Noise pollution

- Noise pollution causes irritation and anger, hearing impairment, increased heart rate and blood pressure along with other physiological effects.
- Unwanted sound is an irritant and a source of stress.
- Industrial and construction activities, machinery, factory equipment, generators, saws and pneumatic and electric drills cause noise.

MOST LIKELY Questions

Short Answer Type Questions (SA)

[3 marks]

22. How does industry pollute the environment? Explain with three examples.

Ans. Industries are responsible for causing the following types of pollution:

- (1) Air
- (2) Water
- (3) Noise
- (4) Land

Air pollution is caused by the presence of undesirable gases, such as sulphur dioxide and carbon monoxide. Smoke is emitted by chemical and paper factories, brick kilns, refineries and smelting plants, and burning of fossil fuels in big and small factories.

Water pollution is caused by organic and inorganic industrial wastes and effluents discharged into rivers.

Noise pollution is caused due to industrial and construction activities.

23. How do industrial units cause air pollution? Explain.

Ans. Industrial units cause air pollution in the following ways:

- (1) Industries that ignore pollution norms cause air pollution created by the presence of high proportion of gases.
- (2) Air borne particulate materials contain both solid and liquid particles, which get released into the atmosphere during production.
- (3) Smoke is emitted by chemical and paper factories, brick kilns, refineries and smelting plants and burning of fossil fuels belong to the major polluting industries.



Related Theory

Government should adopt some measures to stop this air pollution due to factories as it further leads to environmental degradation and then global warming.

TOPIC 6

CONTROL OF ENVIRONMENTAL DEGRADATION

Every litre of waste water discharged by our industry pollutes eight times the quantity of freshwater.

To reduce the industrial water pollution, the following steps can be taken:

- (1) minimising the use of water for processing by reusing and recycling it in two or more successive stages.
- (2) harvesting rainwater to meet water requirements.
- (3) treating hot water and effluents before releasing them in rivers and ponds.

Industrial effluents can be treated in three phases:

- (1) Primary treatment by mechanical means- this involves screening, grinding, flocculation and sedimentation.
- (2) Secondary treatment by biological process.
- (3) Tertiary treatment by biological, chemical and physical processes.

This involves recycling of wastewater.



Important

NTPC is a major power providing corporation in India. It has ISO certification for EMS (Environment Management System) 14001.

The NTPC works for preserving the natural environment and resources like water, oil and gas and fuels in places where it is setting up power plants.

This has been possible through:

- (1) Optimum utilisation of equipment adopting latest techniques and upgrading existing equipment.
- (2) Maximum ash utilisation: This can help in less waste generation.
- (3) Provision of green belts: This nurtures ecological balance and addresses the question of special purpose vehicles for afforestation.
- (4) Reduction of environmental pollution: Ash pond management, ash water recycling system and liquid waste management helps reduce pollution and environmental degradation.
- (5) Ecological monitoring: This reviews and online database management for all its power stations.

Following are the steps for conserving the environment:

- (1) Overdrawing of groundwater reserves by industry should be regulated.
- (2) Smoke stacks should be fit in the factories with electrostatic precipitators, fabric filters, scrubbers and inertial separators to reduce particulate matter in the air.

- (3) Smoke can be reduced by using oil or gas instead of conventional forms of energy in factories.
- (4) Machinery, equipment and generators should be fitted with silencers.
- (5) Machinery should be redesigned to increase energy efficiency and reduce noise.
- (6) In addition to using earplugs, noise absorbing materials can be built in constructing infrastructure.

The challenge of sustainable development requires integration of economic development with environmental concerns.

MOST LIKELY Questions

Long Answer Type Questions (LA)

[4 & 5 marks]

24. How has the NTPC pioneered environmental protection? Enlist a few measures taken by it.

Ans. The NTPC (National Thermal Power Corporation) has been following a very proactive approach for preserving the natural environment and resources like water, oil, gases and fuels in areas where it has established its power plants.

- (1) It has focused upon optimum utilisation of equipment by adopting latest techniques and upgrading existing equipment.
- (2) The NTPC has been trying to minimise waste generation by maximising ash utilisation.
- (3) They have planted green belts for nurturing ecological balance.
- (4) They are using special purpose vehicles for afforestation.
- (5) They have taken measures to reduce environmental pollution through ash pond management, ash water recycling system and liquid waste management.

They have focused upon ecological monitoring, reviews and online database management for all its power stations to maintain balance.

25. Explain the ways through which the industrial pollution of fresh water can be reduced.

Ans. Ways to reduce industrial water pollution are:

- (1) Minimising water usage for processing and other steps in various equipments by reusing the same water again and again and recycling it in two or more successive stages.
- (2) Harvesting rainwater to meet household water requirements and also to help rejuvenate ground water can also reduce water pollution.
- (3) Treatment of hot water and effluents before releasing them in rivers and ponds multiple times to avoid release of toxins like arsenic, lead and mercury.

(4) Segregation of wastes into various categories and appropriate treatment thereafter can also help save plastic from being dumped into water bodies. Plastics choke aquatic animals, thus killing them.

- (5) Reducing usage of non-biodegradable plastic, paper and other synthetic fibres can help generate less disposable waste. Biodegradable and reusable fibres and materials should be encouraged.
- (6) Regulation of the usage of ground water by industries.
- (7) Installing water treatment plants at the industrial sites for recycling.
- (8) Treating chemical and acidic waste before releasing in water bodies.

(Any 5 of 8 points can be written to get full marks)

Case Based Questions (VSA Type)

[4 & 5 marks]

26. Read the source given below and answer the questions that follow:

Overdrawing of groundwater reserves by industry where there is a threat to ground water resources also needs to be regulated legally. Particulate matter in the air can be reduced by fitting smoke stacks to factories with electrostatic precipitators, fabric filters, scrubbers and inertial separators. Smoke can be reduced by using oil or gas instead of coal in factories. Machinery and equipment can be used and generators should be fitted with silencers. Almost all machinery can be redesigned to increase energy efficiency and reduce noise. Noise absorbing material may be used apart from personal use of earplugs and earphones. The challenge of sustainable development requires integration of economic development with environmental concerns.

- (A) Which of the following types of pollution is caused by generators?
- (B) Which of the following devices can be used in a way to reduce smoke?
- (C) Define sustainable development.

Ans. (A) Noise Pollution

(B) Smoke Stacks

Explanation: Smoke stacks can be used in a way to reduce smoke.

(C) Sustainable development can be defined as an approach to the economic development of a country without compromising the quality of the environment for future generations.



Glossary

- (1) **Agglomeration:** The act of amassing/assembling various parts.
- (2) **Coir:** Coarse fiber from the outer husk of coconut.
- (3) **Haulage:** Commercial transport of goods.
- (4) **Khandsari:** A term in hindi for cooked sugar.
- (5) **Pig iron:** Crude iron obtained by smelting iron ore in a blast furnace.
- (6) **Cryolite:** A mineral consisting of a fluoride of sodium and aluminum.
- (7) **NTPC:** Major power providing corporation of India.
- (8) **Green Revolution:** A movement with great increase in production of food grains due to the introduction of high-yielding varieties, began in the mid 20th century.
- (9) **Quarry:** Deep pits from which stone or other materials are extracted.



Chronology

1854: First Textile Mill was established in Mumbai.

1859: First Jute Mill was established at Rishra.

1904: Cement Plant was established in Chennai .

2004: India became the largest producer of Crude steel.

2005: National Jute policy was implemented.