Meaning of the Related Terms: Meanings of the commonly used terms are given below:

1. **Industry:**
   A manufacturing unit is known as industry.

2. **Primary Industry:**
   Any extractive industry, including mining, quarrying, agriculture, Fishing and Forestry are also included in it as they involve in extraction of resources also.

3. **Secondary Industry:**
   In this type the raw materials are processed or components are assembled.

4. **Tertiary Industry:**
   This industry supply services like retailing.

5. **Quaternary Industry:**
   This is concerned with the professions and these services that require a high level of skills, expertise and specialization. It includes education, research and development, administration and financial services such as accountancy.

6. **Manufacturing Industry:**
   Industries, which produce or assemble manufactured products are known as manufacturing industries and the goods produced by these industries are known as final products. The final product is such a product in which further processing is not possible.

7. **Processing Industry:**
   The industry, which involves in changing of raw material into machine able form, is known as processing industries e.g. cotton ginning.

8. **Heavy Industry:**
   Industries producing capital goods or machinery are known as heavy industries. e.g. Pakistan Machine tool Factory.

9. **Capital Intensive Industry:**
   These industries are more machine oriented and more capital intensive or require more money to set up the industry.

10. **Labour Intensive Industry:**
    The industries which require more working hands and less automation. They are known as labor intensive industries.

11. **Raw Material Oriented Industry:**
    The industries which are established at the place of raw material. e.g. Sugar Industry.

12. **Market Oriented Industry:**
    Business is one which carries out market research to find out consumer wants before a product is developed and produced.
13. **Raw Material:**
   A product obtained directly from the ground or Sea. e.g. farming, forestry, mining.

14. **Agro-based Industry:**
   Industries which use agricultural products as their raw materials are called agro-based industries.

15. **Cottage Industry:**
   The industries in which the hand made items are produced for market. In such industries the owner is self employed and helped by the family members only.

16. **Small Scale Industries:**
   In such industries mechanical power is used with a limited number of hired labor along with the family members. If electricity is used, then the number of workers are 20 and if not used then the number of workers are 50.

**Factors influencing the Location and Development of Industries:**

A. **Natural Factors:**
   1. Cheap, Flat and well drained land accessible easily through natural routes.

B. **Human Factors:**
   **Availability of:**
   1. Capital
   2. Labor
   3. Raw material
   4. Power supply
   5. Infrastructure Facilities (Gas, Water).
   6. Efficient Transport
   7. Industrial Estate
   8. Government Policies

**Input:** A resources required for industrial product.

**Processes:** The methods by which the raw materials are converted to finish goods.

**Output:** The products which are produced.
**Industry As A System**

<table>
<thead>
<tr>
<th>Inputs</th>
<th>Processes</th>
<th>Outputs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Natural / Physical</strong></td>
<td>e.g.</td>
<td>Processed goods such as</td>
</tr>
<tr>
<td>Flat Land (cheap &amp; well drained)</td>
<td>Smelting</td>
<td>Cement, Ghee, Soft</td>
</tr>
<tr>
<td>drinks,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Natural routes</td>
<td>Weaving</td>
<td>Packets of tea.</td>
</tr>
<tr>
<td>Climate (moderate)</td>
<td>Spinning</td>
<td>Manufactured goods such</td>
</tr>
<tr>
<td>as</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Human Factors</strong></td>
<td>Dyeing</td>
<td>Drugs, Fans.</td>
</tr>
<tr>
<td>Capital</td>
<td></td>
<td>Garments, Motor cycle.</td>
</tr>
<tr>
<td>Labor</td>
<td></td>
<td>Flowers.</td>
</tr>
<tr>
<td>Raw Material</td>
<td>Printing</td>
<td></td>
</tr>
<tr>
<td>Power Supply</td>
<td>Knitting</td>
<td></td>
</tr>
<tr>
<td>Infrastructure Facilities (Gas &amp; water)</td>
<td>Stitching</td>
<td></td>
</tr>
<tr>
<td>Efficient Transport</td>
<td>Tanning</td>
<td></td>
</tr>
<tr>
<td>Industrial Estate</td>
<td>Moulding</td>
<td></td>
</tr>
<tr>
<td>Government Policies</td>
<td>etc.</td>
<td></td>
</tr>
<tr>
<td>Machinery</td>
<td></td>
<td></td>
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</tbody>
</table>

**By Products**
- Molasses, Bagasse

**Profit**

**Profit invested back into inputs**

---

**Sugar Industry**  *(Raw Material Oriented)*

It is important an agro based and biggest industry of Pakistan. Sugar cane and Beet are the main raw material of sugar industry. After the partition in 1947 there were only 2 sugar industries in Pakistan namely Rahwali (Gujranwala) and Takht Bhai (Mardan). At present 78 sugar plants are working in different parts of the country (Punjab 40, Sindh 32, NWFP 6 and no sugar mill in Baluchistan).

In Punjab most mills are along the eastern side where main sugar cane growing belt is located. Some are located towards the western side.

In NWFP 6 sugar industries are working, 2 industries based on sugar cane and the remaining on Sugar Beet. In NWFP, Sugar Mills are located towards the western and upper parts where as in Sindh most are located in the central and lower parts.
### Sugar Industry As A System

<table>
<thead>
<tr>
<th>Inputs</th>
<th>Processes</th>
<th>Outputs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Natural / Physical</strong></td>
<td>e.g.</td>
<td>White</td>
</tr>
<tr>
<td>sugar</td>
<td>Washed</td>
<td></td>
</tr>
<tr>
<td>Flat Land (cheap &amp; well drained)</td>
<td>Crushed</td>
<td></td>
</tr>
<tr>
<td>Water</td>
<td>Juice Collected</td>
<td></td>
</tr>
<tr>
<td>Climate (moderate)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Human Factors</strong></td>
<td>Refined</td>
<td></td>
</tr>
<tr>
<td>Capital</td>
<td>Crystallized</td>
<td></td>
</tr>
<tr>
<td>Labor (Skilled &amp; unskilled)</td>
<td>Whitened / made into white sugar</td>
<td></td>
</tr>
<tr>
<td>Raw Material (Sugar cane)</td>
<td>Molasses / brown sugar</td>
<td></td>
</tr>
<tr>
<td>Power Supply</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Machinery</td>
<td>etc.</td>
<td></td>
</tr>
<tr>
<td>Efficient Transport</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Packing Material</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Government Policies</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>By Products</strong></th>
<th><strong>Profit</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Molasses, Bagasse</td>
<td>Profit invested back into inputs</td>
</tr>
<tr>
<td>Press mud.</td>
<td></td>
</tr>
</tbody>
</table>

**Uses of By Products**: (Sugar Mill)

**Bagasse**: It is dry pulpy residue left after the extraction of juice from sugar cane.
- Used as a fuel
  - Can be used to generate electricity
  - Animal feed
  - chipboard / paper / basket.

**Molasses**: It is thick, dark brown juice obtained from raw sugar during the refining process. It is made from either sugar cane or sugar beet juice which is boiled down to a syrup. Sugar crystals are extracted from the syrup and the remaining dark liquid is molasses.
- Used as animal feed / synthetic rubber / packaging / chemical industry
- citric acid / alcohol / fuel.
Study Fig.1, which shows the location of Sugar mills in Pakistan.

**Q.1. Describe the distribution of the sugar mills.**
**Ans.** Widespread / from north to south.
Along the rivers.
Especially in east.
Upper Indus Plain / Punjab.
Lower Indus Plain / near the Indus in Sindh
A few in NWFP.
None in Balochistan.
None in extreme north.

**Q.2. Explain why sugar mills must be close to areas of sugar cultivation.**
**Ans.** Must be crushed quickly after / within 48 hours of harvesting / cutting.
Rapid loss of weight after cutting.
Rapid loss of sugar content.
Keep down transport cost as bulky / heavy.
Q.3. What happens to sugar cane from the time it is fully grown to when sugar juice is extracted?

**Ans.** Cut by hand / manual labor
Transported by bullock cart / lorry / truck
Quickly transported
Scrubbed with chalk to remove dirt and smell
Crushed to remove juice in heavy rollers.

Q.4. Select a sugar mill at one of the following locations: Faisalabad Mardan Thatta Jhang

**Ans.** Flat site on Indus plain (valley floor) in vale of Peshawar
Sugar cane grown in area around mill
Power provided by use of bagasse a by product of sugar industry
Power provided by HEP
Water from River Swat / canal / River Indus / Lake Haleji
Skilled labor trained at universities / colleges in Pakistan / abroad
Cheap labor (unskilled) nearby towns
Machinery imported / made in Taxila
Financial backing from government / banks / foreign investors
Good network of road.

Q.5. At sugar mills the milling season lasts only 160 days. What problems does this cause and how might they be overcome?

**Ans.**

**Problems**
Seasonal employment / unemployment for rest of year
Skilled workers may be lost to other industries permanently / shortage of labor
Machinery deteriorates with lack of use.

**Solutions**
Develop industries using the by products
Casual labor migrate to other employment / work in cottage industries
Offer incentives to keep / attract labor.

Q.6. Explain the causes of sugar crises in Pakistan.

**Ans.**

1. Rapidly increasing population
2. Demand increasing due to growth of hotels and shops
3. Fluctuations in the yield of sugarcane due to bad weather conditions and the attack of pests and diseases.
4. Low recovery of sugar from sugarcane
5. Dispute between the growers and the mill owners.
6. Only 40% of the total yield is used for making sugar and rest is crushed for making Gur (raw sugar).
7. Political instability.

Q.6. Name two by-products from sugar-cane processing and give a use of each of them.

**Ans.**

**Bagasse:** Paper / chipboard / baskets / animal feed / fuel.

**Molasses:** Animal feed / synthetic rubber / packaging / chemical industry / citric acid / alcohol / fuel.
Cotton Textile Industry  (Market Oriented )

It is the largest industry of Pakistan. It provides employment opportunities to 50 % of industrial labor force. It contributes 7 % of G.D.P. to the economy of our country and also a source of foreign exchange. It has been established in different parts of our country i.e. Karachi, Faisalabad, Hyderabad, Multan, Lahore and other small cities like Jhang.

Cotton Textile Industry As A System

<table>
<thead>
<tr>
<th>Inputs</th>
<th>Processes</th>
<th>Outputs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Natural / Physical</strong></td>
<td>Spinning</td>
<td>e.g.</td>
</tr>
<tr>
<td>Flat Land (cheap &amp; well drained)</td>
<td>Weaving</td>
<td>Cloth, Garments.</td>
</tr>
<tr>
<td>Natural routes</td>
<td>Bleaching</td>
<td>Yarn, Towels.</td>
</tr>
<tr>
<td>Climate (moderate)</td>
<td>Dyeing / Printing</td>
<td>Hosiery.</td>
</tr>
<tr>
<td><strong>Human Factors</strong></td>
<td>Cutting</td>
<td></td>
</tr>
<tr>
<td>Capital</td>
<td>Stitching</td>
<td></td>
</tr>
<tr>
<td>Labor</td>
<td>Packing</td>
<td></td>
</tr>
<tr>
<td>Raw Material (Raw Cotton)</td>
<td></td>
<td></td>
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<tr>
<td>Power Supply</td>
<td></td>
<td></td>
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<tr>
<td>Infrastructure Facilities (Gas &amp; water)</td>
<td></td>
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<tr>
<td>Efficient Transport</td>
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<tr>
<td>Machinery</td>
<td></td>
<td></td>
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<tr>
<td>Government Policies</td>
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</tr>
</tbody>
</table>

Profit

Profit invested back into inputs

**Ginning:** It is a process of separating cotton seed from lint for further processing in textile industries.

**Spinning:** It is the process of making yarns from the textile fibre is called spinning.

**Weaving:** It is a method of textile production in which two distinct sets of yarns or threads are interlaced at right angles to form a fabric or cloth.
**Knitting:** It is a method by which yarn is manipulated to create a textile or fabric.

Study **Fig.2**, which shows the distribution of the cotton textile industry in Pakistan.

![Map of Pakistan showing the distribution of the cotton textile industry](image)

**Fig.2**

**Q.1.** Describe the distribution of the cotton textile industry.

**Ans.** Most factories in Punjab
- Along rivers (in Punjab) River Indus (in Sindh)
- Southern / Lower Sindh e.g. Hyderabad, Karachi
- Northern / upper Sindh e.g. Sukkur, Larkana
- KPK e.g. Peshawar, Nowshera
- Northern Balochistan e.g. Quetta.

**Q.2.** Two of the three main cotton textile manufacturing centers of Pakistan are situated within areas which grow cotton. Name one of these centers.

**Ans.** Faisalabad and Hyderabad.

**Q.3.** Explain why Karachi / Faisalabad are the largest cotton textile manufacturing centers in Pakistan.

**Ans.** Capital available from investors.
- Cotton growing area in Indus valley of mid-Sindh accessible.
- Major roads from cotton growing areas. Railway from cotton growing areas.
- Electricity from national grid / nearby power station.
- Imported machinery enters Pakistan through the Karachi sea port.
- Close to sea port / dry port for exports.
- Large domestic market. Government schemes (loans, EPZ, industrial estates).
Availability of labor. Better infrastructure facilities.
Flat land. International Airport.

Q.4. Quetta is a ‘market oriented’ cotton textile manufacturing center. What does this mean?
Ans. Gateway for exports to Iran and Afghanistan. Its main advantage is its local market. There is large population to buy the products. It is not a major producing area.

Q.5. Explain what can be done to improve Pakistan’s cotton textile industry.
Ans. Increase production of cotton crop / quality of cotton crop, Research into solutions to leaf-curl virus, Irrigation, More investment/government support/tax holidays/loans Address child labour/environmental issues to ease international restrictions Modernise machinery/plant/technology, Increase availability of power/electricity Training / education of workers

Q.6. How may a cotton textile industry in Karachi / Faisalabad be affected by July floods in the Punjab Province?
Ans. Cotton crop may be ruined / yield much reduced by floods. Communication may be damaged. Supply of raw material may be insufficient. Price of raw material may be increased. Production (of cloth) may be less. Loss of revenue. Lose market. Cannot pay / keep skilled workers. May have to import raw material (cotton).

Q.7. List the following in order of production:
Cloth Raw Cotton Cotton Yarn Ready-made Garments

Q.8. From the above answer state one product of:
A. a processing industry.  
B. a manufacturing industry.
Ans. A. A processing Industry Cotton Yarn / thread or cloth.
B. A manufacturing Industry Cloth or Ready-made Garments.

Q.9. Explain why Lahore is an important center of the textile industry.
Q.10. Why is a large proportion of the production of cotton textile industry exported?
Ans. To make capital / improve trade balance.
    To earn foreign exchange.
    Good quality.
    Good reputation of Pakistan.
    Demand from abroad.
    Popularity in the world.

Q.11. How can Pakistan maintain and increase the exports of cotton textile industry?
Ans. Improve quality.
    More export processing zones.
    More dry ports.
    Machines to replace work.
    New products.
    Reliable supply.
    Government incentives.
    More large factories.
    Better roads / communication.
    Advertising.

Q.12. How does industry (cotton textile) in cities pollute the environment?
Ans. Effluent in river (effect on fishing, drinking water and irrigation).
    Effluent in sea water (effect on fishing e.g. Indus delta. Mangrove forest).
    Smoke / gases in air (health problem, acid rain, global warming).
    Traffic congestion in urban areas.
    Waste from factories and people.
    Loss of scenery by construction.
    Noise pollution.

Q.13. How may a cotton textile factory in Karachi be affected by July floods in the Punjab?
Ans. Cotton crop may be ruined / yield much reduced by floods.
    Communications may be damaged.
    Supply of raw cotton may be insufficient / delayed.
    Production of cloth may be less.
    Lose market.
    Cannot pay / keep skilled workers.
    May have to import raw cotton.

Q.14. What are the advantages and disadvantages of developing the cotton manufacturing industry in Pakistan?
Ans. Advantages.
    Job opportunities. Cheap labor available.
    Value-added exports. Less imports.
    Can compete with other countries. Good reputation worldwide.
    Disadvantages.
    Lack of modern skills / education. Lack of money to invest.
    Competition from other countries. Old machinery. Power shortage.
    Poor roads and railways / transport to ports.
Lack of investment in other industries.
Water shortage for manufacturing.
Machines will replace manpower / loss of unskilled jobs.

Study Fig.3, which shows the location of Faisalabad.

Q.15. State three factors shown on Fig.2, which influence the cotton industry in Faisalabad. For each factor, explain its importance to the development of this industry.

Ans. Irrigated Farmland for raw cotton e.g. Rechna Doab.
Rivers / Barrages supply water for washing cotton.
Road / Railway for supply of goods, sales.
Dry port for exports, transport to Karachi.
Thermal power for electricity supply for machines etc.
Airport for businessmen.

Study Fig.4.
Q.16. In recent years there has been little growth in the cotton textile industry. With reference to Fig.3, explain the advantages and disadvantages of increasing cotton textile production in Pakistan.

Ans. Jobs

More available, can reduce unemployment, higher income, formal employment.  
But. Need for literacy and skills, may cause rural urban migration its consequences.

Skills

Beneficial to workforce, higher earnings.  
But. Shortage of training at the present time.

Competition

Will improve standards.  
But. Cannot compete, low quality of products, cheaper.

Trade

Increase trade, earn foreign exchange, improve balance of payments, pay off debts.  
But. Poor roads / rail, inadequate port facilities.

Technology

Good for development, can improve quality and or quantity.  
But. High cost, lack of skilled workforce, unemployment, shortage of power, more imports.

Infrastructure

Stimulates construction of better roads, railways, power supply, water supply.  
But. Higher cost, shortage of sources e.g. power, water.

Q.17. Give an example of a job in each of the primary, secondary and tertiary sectors of the cotton industry.

Ans. Primary: Farming, picking, bringing water  
Secondary: Washing, dyeing, spinning, weaving  
Tertiary: Sales, transport, management.

Cement Industry (Raw material Oriented)

Cement is key factor in economic development of the country. There are many favorable factors for the development of cement industries. e.g.

1. Availability of raw material (Limestone and Gypsum).
2. Good domestic market with high demand from the construction industry.
3. Natural gas is used as a cheap fuel.

At the time of independence, Pakistan had 5 cement factories and was the exporter of cement. But with the development work starting in Pakistan the country became an importer of cement. Now there are 24 cement units are working in the country. Out of these 24 units, 4 units are in the public sector and the rest are in the private sector.

Although the cement industry is based on local raw material. however, there is rising trend in the price of the cement for the last few years. The main causes are (i) decline in production (ii) General inflationary trend in the country.
The cement industry is wide spread in the country due to availability of raw material. The following are 24 cement factories located at various parts of the country specially in all the provinces e.g. Dandot. Gharibwal. Attock. Mianwali. Daud khel. Rawalpindi. D.G.khan. in Punjab province. Hazara. Kohat (KPK) Karahci. Sukkur. Hyderabad. Thatta. (Sindh) Kalat (Baluchistan).

### Cement Industry As A System

<table>
<thead>
<tr>
<th>Inputs</th>
<th>Processes</th>
<th>Outputs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Natural / Physical</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Limestone</td>
<td>Grinding</td>
<td>Cement.</td>
</tr>
<tr>
<td>Gypsum. Water</td>
<td>Heating</td>
<td>Cement Powder</td>
</tr>
<tr>
<td>Natural gas / Coal</td>
<td>Mixing</td>
<td>Cement Blocks.</td>
</tr>
<tr>
<td>Clay / Shale</td>
<td>Packing</td>
<td>Bricks.</td>
</tr>
<tr>
<td>Sand.</td>
<td></td>
<td>Slabs.</td>
</tr>
</tbody>
</table>

**Human Factors**
- Capital
- Labor
- Machinery
- Power
- Technology
- Efficient Transport
- Skills.
- Packing Material

### Profit

*Profit invested back into inputs*
Fig. 7 shows how cement is made.

Q.1. **State three natural inputs that are needed to make cement.**


Q.2. **Explain the importance of three human inputs at a cement factory.**


Q.3. **Why is there a large demand for cement in Pakistan?**

*Ans.* Domestic construction e.g. houses. Industrial construction e.g. Factories. Institutional buildings / schools / hospitals / offices. Communication e.g. roads. Bridges. railway sleepers. Port developments. Water management e.g. Dams. canals. embankments. Pakistan has insufficient timber. Pakistan has insufficient steel. Pakistan has huge deposits of limestone to make cement.

Q.4. **Give three reasons for the continuous increase in cement manufacture from 2000 to 2009.**

*Ans.* Industrial / economic development,
Urbanization / construction
Better / more housing, roads, offices, factories
Population increase
Raw materials cheap
Raw materials readily available.

Study Fig.8, showing the distribution of cement factories in Pakistan.

Q.5. Describe the distribution of cement factories in Pakistan.
Ans. Widespread and exist north to south
     Mostly in Indus plain and few in KPK
     Close to coast in Sindh
     None in Balochistan.

Q.6. Suggest why there are no cement factories in Balochistan.
Ans. May be no limestone / gypsum
     Mining difficulties due to mountains
     Low rainfall / drought makes working difficult
     Lack of water
     Transport problem
Study the Photograph. A, showing a cement factory near Ghulamullah, in Thatta District.

Q.7. Describe the scene in the photograph.
Ans. Flat and large area
     Rough road to factory.
     Vegetation in background.
     Chimney.
     Smoke / Dust / air pollution.
     Stones / rocks.
     Tyre tracks.
Fertilizer Industry

**Introduction:** Pakistan is an agricultural country which require large quantity of cow dung and other natural manure. But they cannot meet the growing demand. Therefore chemical fertilizers gain special importance and three types of chemical fertilizers are used namely Nitrogenous fertilizers, Potassium fertilizers and Phosphorus fertilizers. The consumption of chemical fertilizers has increased specially after green revolution. Production of chemical fertilizers in Pakistan was started in 1960s. When industrial development corporation established two fertilizer industries at Faisalabad and Daudkhel. Once natural gas was discovered in 1952 at Sui that too proved a rip source of chemical fertilizers and a factory was set up in Multan (Pak-Arab Fertilizer Company). It started production in 1979. Since then Urea plants have been established in Sheikhupura, Mirpur Mathelo, Haripur, Machigot, Dharki and a super phosphate plant at Jaranwala.

### Fertilizer Industry As A System

<table>
<thead>
<tr>
<th>Inputs</th>
<th>Processes</th>
<th>Outputs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Natural / Physical</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flat Land (cheap &amp; well drained)</td>
<td>Preparation of raw material</td>
<td>Urea.</td>
</tr>
<tr>
<td>Phosphorus</td>
<td>Chemical reaction</td>
<td></td>
</tr>
<tr>
<td>Natural Gas, Nitrogen, Gypsum</td>
<td>Separation of Fertilizer</td>
<td></td>
</tr>
<tr>
<td>Nitrogenous</td>
<td>(i) Filtering</td>
<td>Potassium.</td>
</tr>
<tr>
<td>Sulphur, Potassium / Potash</td>
<td>(ii) Evaporation</td>
<td></td>
</tr>
<tr>
<td>Phosphate, Ammonia,</td>
<td>(iii) Prilling</td>
<td></td>
</tr>
<tr>
<td>Fish / animal remains / bones</td>
<td>(iv) Bagging / Packing</td>
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<tr>
<td>Climate (moderate)</td>
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<td></td>
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</tbody>
</table>

### Human Factors

- Capital
- Labor
- Machinery
- Power Supply
- Infrastructure Facilities (water)
- Efficient Transport
- Government Policies

### Profit

Profit invested back into inputs

### Process

Rotten plants, animal waste and some required chemicals are put together in a big Iron container. The mixture is heated until it is converted into a thick paste. Now natural gas is added to it without burning in raw form. In last stage the paste is dried and its grains are made for easy application. Following are the fertilizer companies:

- **Engro** fertilizer company,
- **Fauji** fertilizer company,
- **Pak Arab** fertilizer company,
- **Fatima** fertilizer company.
Q.1. **What is meant by the term ‘fertilizer’?**

**Ans.** A chemical addition to the land to make the soil more fertile.

Q.2. **Name two raw materials, apart from natural gas, which are used to make fertilizer.**

**Ans.** Nitrogen, Sulphur, Gypsum, Potassium / Potash, Phosphate, Ammonia, Fish / animal remains / bones.

Q.3. **Explain why most fertilizer factories are in the Punjab and northern areas of Sindh.**

**Ans.** Main farming areas. Fertile soil. Good irrigation system. Less flooding now to replace nutrients. Large population to feed. Good roads for transport. Availability of raw material, i.e., Gypsum, Natural gas.

Q.4. **Why is it important that Pakistan manufactures its own fertilizers?**

**Ans.** Expensive to buy. Reduce imports. Improve balance of payments. Produce more food for large population. Produce more crops for exports. Increases employment.

Q.5. **What environmental damage can occur when a new fertilizer factory is built in a Rural area?**

Study the Fig.4, which shows the location of fertilizer Industry in Pakistan.

**Q.6. Describe the distribution of Fertilizer Industry in Pakistan.**

**Ans.** Less no. of fertilizer industries.
Along the rivers.
Mostly in upper Indus Plain.
North side of Sindh Province.
One in KPK.
None in Balochistan and in northern areas.
Study Fig.5, which shows fertilizer production in Pakistan.

**Fig.5**

Q.7.  **By how much did fertilizer production increase from 2000 to 2008?**
Ans.  1.0 – 1.2 / 1000 – 1200.

Q.8.  **Compare the production from 1990 and 2000 to that from 2000 to 2008.**

Overall rate of increase.

3.0 – 4.6 / 1.6 million tones compared with 4.6 – 5.7 / 1.0 – 2 million tones.

Q.9.  **What are the benefits of increasing fertilizer production for the people and the economy of Pakistan?**
Ans.  Higher yields.

More food production.

More agricultural exports.

Reduced imports of fertilizer, or improved balance of payments.

Less GNP. Higher farm incomes / profits.

More jobs.

Cheaper cost of fertilizer.

More industrial goods (e.g. cotton).
Q.10. Fertilizers are used by farmers on their fields. Suggest three problems that using fertilizers could cause for the environment and people of Pakistan.

Ans. Can upset ecosystems,
- May damage natural food chains
- Damage to species / plants / animals,
- Eutrophication / loss of oxygen in water
- Fish die / algae growth limits light into water
- Polluted water / chemicals get into water cycle
- Illnesses to people
- Shortage problem.

Q.11. Chemical fertilisers to help increase agricultural production are one of Pakistan’s main imports. These imports are expensive. Read the following two views:

A. Pakistan should manufacture more of its own chemical fertilisers to reduce the need for importing them.

B. Pakistan should rely less on chemical fertilisers and reduce the need for importing them by using natural alternatives.

Which view do you agree with more? Give reasons to support your answer and explain why it is important to reduce imports of chemical fertilisers.

Ans. Chemical fertilisers
Modern factories (e.g. Enven-Engro in Daharki, Sindh) are energy efficient / environmentally compliant
Cow dung is in insufficient amounts / used as a fuel in rural areas
Pakistan has large supplies of natural gas (the main raw material for fertiliser) (at Sui)
Natural alternatives
Fertiliser factories use large amounts of fuel (especially natural gas)
Ample source of manure from large livestock sector
Ample source of compost from agricultural waste
Alternative methods of improving soil quality are possible (crop rotation / nitrogen-fixing plants / beans / legumes / avoiding overcropping / multi-cropping)
Importance
The cost of imports (trade / balance of payments deficit / imports>exports) (fertilisers one of top 5 imports / 2% imports)
Chemical fertilisers cause water pollution (agricultural runoff containing chemicals goes into streams / rivers / causes eutrophication)
Iron and Steel Industry  (Capital Intensive)

Introduction:- The establishment of iron and steel industry is considered to be a milestone road to industrialization. Pakistan steel mill corporation with technical and financial assistance from USSR (Union of Soviet Socialist Republic). It was established in December 1973. It is located about 40 kilometers east of Karachi at Pipri on Gharo Creek near Port Bin Qasim. The capital cost of steel complex was 25.5 billion rupees. The steel mill covers an area of about 75.4 km$^2$ including 38.9 km$^2$ of steel town ship (residential area of workers). The production capacity of Pakistan steel mill is 1.1 million tones of steel annually and has a potential to expand to over 3 million tones.

Iron ore and Coal used as a raw material in this industry. But both raw materials are not enough in Pakistan so we import from abroad. We import iron ore from Australia, Brazil, India and Liberia and coal from Australia.

Iron and Steel Industry As A System

<table>
<thead>
<tr>
<th>Inputs</th>
<th>Processes</th>
<th>Outputs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural / Physical</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flat Land (cheap &amp; well drained)</td>
<td>Mining</td>
<td>Sheets.</td>
</tr>
<tr>
<td>Limestone. Water</td>
<td>Grinding</td>
<td>Plates.</td>
</tr>
<tr>
<td>cast Billets.</td>
<td>Concentration</td>
<td>Rolled &amp;</td>
</tr>
<tr>
<td>Chromite</td>
<td>Refining</td>
<td>Slabs.</td>
</tr>
<tr>
<td>Climate (Moderate)</td>
<td>Casting</td>
<td>Girders.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Galvanised Products.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Human Factors

Capital
Labor
Machinery
Power
Technology
Efficient Transport
Skills.

Profit

Profit invested back into inputs

Q.1. Explain why the Pakistan Steelworks is called ‘a large scale industry’.
Ans. Handles large quantities of raw materials.
Large production / large output / generates large income.
Large area / site. Large electricity use / local power station.
Large gas use / large pipeline. Large workforce. Higher output per worker.
Large capital. Mechanised / Standardisation of products.
Q.2. **Explain why Steel Mills was built on Gharo Creek.**

**Ans.** Area of flat land  
Deep water  
Wide / large area of water  
Sheltered water  
Cheap / unpopulated area  
Near / 20-23 kms from center of Karachi  
Close to National Highway to Karachi  
Close to main railway line to Karachi

Q.3. **Name three raw materials used in the Pakistan Steel Mills.**

**Ans.** Iron ore, coal, limestone, manganese, chromite.

Q.4. **Why are most of the raw materials imported?**

**Ans.** Iron ore not mined in Pakistan.  
Coal poor quality.  
Small output / lack of development of resources.
Study Fig.6, which shows the location of Pipri Steelworks.

Q.5. With reference to Fig.6, explain why the steel mills were located here.

Ans. Coastal site / Port (Bin) Qasim for imports
     Berths by creek for unloading
     Widened channel for effluent / shipping
     Railway / road for supply of limestone / workers and for distribution of finished products
     Township / houses for workers
     Large / open site for waste disposal, storage, building etc.
Study Fig.7.

Fig.7
Name the following:
A. the port where iron ore and coal are imported.
   Port Qasim.
B. the site of the Pakistan Steelworks.
   Pipri.
C. the lake that supplies water to the Pakistan Steelworks.
   Haleji.
D. the destination of the motorway from Karachi.
   Hyderabad.

Read the extract below.
Imports of steel increased by 37% from 2004 to 2005 as a growing amount of machinery and industrial steel products flowed in. This is more than any government predictions.

Q.6. Explain the advantages and disadvantages of increasing steel production in Pakistan.
Ans. **Advantages.**
Cheaper supplies (than imports)
Saves foreign currency / improve balance of payments / reduce imports
Can be used for development / industrialization e.g. construction, machinery
Larger GNP
Independence from other countries
Employment opportunities.

**Disadvantages**
Lack of raw materials
High cost of imported iron ore / other raw material
Burden on economy / less development
Cost / lack of machinery / technology
Cost / lack of infrastructure / power supplies / roads etc.
Lack of skilled labor
More waste / named pollution
May encourage rural-urban migration

Q.7. **Explain how human inputs such as those can improve production.**

**Ans.**

**Labor.** Work machine, carry materials, office work.
**Capital.** Wages, machines, technology, investment.
**Machinery.** Faster, better quality, new products.
**Skills.** Computers, office work, machines.
**Technology.** Quality, speed, modernization.
**Transport.** Faster, larger supply, bigger markets.
**Power.** Efficiency, speed, quality.
**Govt. policies.** Tax concessions, training.

Q.8. **Why is over 50 % of the output of Pakistan Steel sent north from Karachi to the Punjab?**

**Ans.**

Construction of buildings / Bridges.
Machinery for industry.
To Taxila. Heavy engineering.

Q.9. **Why is coal imported for iron and steel industry?**

**Ans.**

Poor quality of local coal.
Mixed with local coal.
Not enough local coal.

Q.10. **What features of Pakistan Steel show that it is an industry in the ‘formal sector’?**

**Ans.**

Large scale industry. Good quality goods.
Capital intensive.
Regular working hours. Regular wages.
Legal and registered. Employed labor.

Other than steel making a number of engineering plants are working in the country detail of the some is given below.

Q.11. It has been proposed that a large integrated iron and steel mill should be built on the outskirts of Rawalpindi, Punjab.

80 km2 of land will be cleared for the mill and new infrastructure will be provided to the site by the local authorities. Large amounts of raw materials will be brought onto the site by road or rail and it is planned to produce up to 3 million tonnes of finished steel per year.
Evaluate how the new integrated iron and steel mill will affect the local people of Rawalpindi. Give reasons to support your answer. You should consider both benefits and problems in your answer.

Ans. **Benefits**
- Employment opportunities
- Improvements to roads/other infrastructure
- New settlements
- Educational/recreational facilities
- More trade for local shops
- More work for local ancillary/related industries

**Problems**
- Farmland/grazing
- Air pollution/dust from chimneys, etc.
- Visual pollution/eyesore
- Roads/railways congested
- Attracts migrants
- Uses large amounts of water/power

**Ore:** A naturally occurring solid material from which a metal or valuable mineral can be extracted.

**Iron Ore:** A rock or mineral from which iron can be extracted.

**A Heavy Mechanical Complex**
This complex was established at Taxila with Chinese help in 1979 and it has an annual capacity of 60,000 tones. Its main products are sugar mill’s equipment, cement factory machinery, overhead traveling cranes, road rollers, Truck chasses and low pressure package type boilers.

**Pakistan Machine Tool Factory**
This was established at Karachi in 1968 with Swiss help, now it has grown into a sophisticated engineering complex. Its main products are engineering tools, transmission components and automotive parts.

**A Heavy Foundry and Forge Complex**
This was set up at Taxila with Chinese help in 1976. Its has steel melting capacity of 60,000 tones. Its mainly fulfills the needs of railways and automobiles and produce heavy machinery as well.

**Karachi Shipyard and Engineering Works**
It was started in 1956 and it can built and repair ships. Other than the local it also serves the foreign orders.