

ECONOMICS

(Indian Economic Development)

Chapter 8: Infrastructure



INFRASTRUCTURE

Infrastructure:

Infrastructure refers to a situation in which an individual is unable to fulfill the basic necessities of life. In other words, it is the ability of an individual to fulfill the minimum requirement of life like food, clothing, shelter, education and health facilities etc.

It refers to all such activities, services and facilities that are needed to provide different kinds of services in an economy. It provides supporting services to the main areas of industry, agriculture production and trade and commerce. It includes services like railways, roads, irrigation, public utility (electricity, communication, health, energy etc.) and so on. In other words, Infrastructure refers to the support system of the economic and social development of the economy.

Kinds of infrastructure:

- It includes such elements of infrastructure which are essential for the development of the economy.
- It includes transportation, communication, electricity, science and technology and financial distribution.
- It promotes the economic activities of the country.

Economic infrastructure: It includes such elements of infrastructure which are essential for the development of the economy. It includes transportation, communication, electricity, science and technology and financial distribution. It promotes the economic activities of the country.

Socialist infrastructure: It includes such services and provisions which improves the quality of resources and the standard of living. It accelerates the process of human development. It includes education, health, housing etc. A good social infrastructure increases the productive capacity of an individual.

Importance of Infrastructure:

- **Increases productivity:** The productivity of an economy directly depends upon the infrastructure. A well developed infrastructure always accelerates the production capacity of the economy. **Example:** Proper irrigation facilities improves the crop production.
- **Provides employment opportunities:** Development of infrastructure facilities increases the employment opportunities in an economy. **Example:** construction of road requires manpower and hence it creates employment opportunities etc.
- **It facilitates the functioning of an economy:** In order to operate and work with full efficiency, the economy needs well developed infrastructural facilities, such as

proper communication facilities, transportation facilities, electricity, banking etc.

- **Promotes economic growth:** The growth of an economy depends upon many factors such as production capacity, human capital formation, quality of life etc. and in order to promote and enhance the above factors, a well developed infrastructure facilities are mandatory.
- **Improves quality of life:** Proper education, health care facilities and standard of living comprises the quality of life, and the socialist infrastructure mainly focuses on these sectors only. Increase in quality of life improves the ability of an individual to work.
- **Facilitates outsourcing:** A country with well-developed infrastructure facilities always becomes a center of outsourcing work. From past few years, India is emerging as a global destination of Business process outsourcing, call centers etc, due to a good infrastructure.

State of infrastructure in our country:

- The state of infrastructure of the economy was very poor.
- We spend only 5% of our GDP on infrastructure whereas China spend 20%, Indonesia 14% and Korea 7% of their GDP.
- Most of the household in rural areas (around 82%) uses bio fuel for cooking.
- In 2010, only 62% of rural household have electrification.
- The sanitation facility was only 6% in rural areas.

Energy:

One of the most important and key component of economic infrastructure is energy. It can be treated as a lifeline of production activity across all the sectors of the economy.

Sources of energy:

Conventional and non-conventional sources of energy

Conventional sources:

- The energy which have a long history of their knowledge and use. In other words, it refers to the sources of energy which we are using since long period of time.
- It is limited in nature.
- They are non-renewable.
- These sources of energy generally pollutes the environment.
- These sources of energy are more expensive in nature.
- Example: coal, petroleum, natural gas etc.

Non-conventional sources:

- The sources of energy which comes into existence in the recent past. In other words, it refers to the sources of energy which has been discovered just because of modern technology (used just from past few years)
- They are unlimited in nature.
- They are renewable in nature.
- It generally does not pollutes the environment.
- They are less expensive in nature.
- Example: solar energy, wind energy, tidal energy, bio mass etc.

Power/electricity:

One of the most critical and most important components of infrastructure which directly signifies the modern civilization is electricity. With increase the prospectus of development of the economy the demand of electricity is also increasing day by day. The rate of demand of power is far ahead than the growth rate of GDP.

Sources of power generation:

There are basically 3 sources of generation of electricity.

- **Thermal power:** The power is generated through coal, oil and natural gas. Around 70% of total electricity is generated through thermal power.
- **Hydro and wind power:** The power is generated through wind mill or from the waters of dams and fast flowing rivers. Around 28% of total electricity is generated through thermal power.
- **Nuclear power:** The power is generated through radio-active elements (such as uranium) Around 2% of total electricity is generated through thermal power.

Challenges in power sector:

- **Transmission and distribution loss:** The first and foremost problem that is faced by the electricity department is the transmission and distribution loss. The loss in electricity while flowing from one place to another can be due to backward technology or due to loss by theft.
- **Insufficient installed capacity:** Although there exist massive production of electricity in the economy but the production is yet not sufficient to meet the demand. This deficit supply may results in power cuts, low voltage, excessive load on distribution and many other problems.
- **Under utilization of capacity:** One of the major drawbacks of power sector is the lack of proper utilization of thermal power stations. Due to the lack of proper technology the power plants are underutilized. In 2016-17, India was just able to utilize 60% of the total capacity.
- **Shortage of raw materials:** Thermal power plant, which is the main source of Indian

power sector, is facing shortage of coal supplies and other raw materials due to which the power sector is inefficient.

- **Poor performance of State electricity boards:** The state electricity board which provides electricity supply in the economy are running in huge losses, these boards lacks funds to make payment for the electricity purchased by them. This shortage of fund may be due to distribution loss, theft of power, free power in agriculture etc.
- **Lack of public cooperation/public unrest:** Due to heavy taxes and massive power cuts across the different parts of the country, power sector always lack the cooperation of general public.

Measures to overcome challenges of power sector:

- **Reduce transmission and distribution loss:** In order to meet the demand of power, the first and most important task is to reduce the wastage of power. The power which is waste during transmission and distribution should be minimized; it can be done by improvement in technology, stop theft of power and so on.
- **Improve plant load factor:** As stated earlier, the main deficit of power sector is the under utilization of plants. So the main task of the power sector is to make proper utilization of existing capacity of the power stations. It will help to increase the power generation without increasing the number of plants. Plant load factor (PLF) indicated the capacity utilization of a plant $PLF = \text{Electricity Generated}/\text{Production Capacity}$.
- **Increase production capacity:** The installed capacity of the existing plants needs to be increased, so that the supply of electricity across all the sectors of the economy can match the desired amount of demand.
- **Increase the supply of inputs:** Thermal power plants in India (which generally faces shortage of inputs) must receive regular supply of inputs (coal and other raw materials). This would insure fully utilization of existing plant capacity.
- **Promote the use of CFL and LEDs:** Use of such appliances which consume lesser amount of electricity must be promoted. CFL (Compact Fluorescent light) and LEDs (Light emitting diodes) provides electrification in the economy with low amount of consumption of energy and power.
- **Encourage FDI and privatization of power generation:** Private sector must play a significant role in the generation of power in India. The government must encourage the participation of private sector and foreign direct investment (FDI) in power generation.

Health:

Health refers to the state of complete physical and mental well-being of an individual. Good health does not only mean absence of disease but it implies the increase in overall efficiency of an individual. Increment in health results in better productivity of

labour which ultimately increases the productivity of the economy as a whole.

State of health infrastructure:

- There has been a great expansion in Indian health sector after independence but yet it is quite below the satisfactory measure.
- Being the second most populated country in the world, the health sector of our country lacks the connectivity across different areas of the economy.
- There is a massive gap between rural and urban areas in context of utilizing the health care facilities.
- However, from past few decades, the increase in development of health care sector has pick up the pace.
- India has build up variety of health care facilities across different areas of the country, At village level, Primary health centers have been set.
- The role of private sector in health infrastructure has also increased upto 70%. Although the role of private sector has increased upto greater extent, but still the role of government health care centers is very important. As poor sections of the society can depends upon the government hospitals due to low cost treatment.

3 tier healthcare system:

India adopted 3 tier healthcare system in the economy. This system includes 3 types of health care centers.

Primary health care:

- These centers provides basic health care facilities such as maternal and child health care, immunization, educating the people (about identifying, preventing and controlling diseases) etc.
- These centers are generally managed by a single doctor, a nurse and few.
- These centers are generally set-up in villages and small towns.
- If a patient is not been able to managed by these centers then they are referred to the secondary or tertiary hospitals.

Secondary health care:

- Hospitals having better facilities for surgery, x-ray, ECG are called secondary health care institutions.
- Generally located in districts and big towns.
- Provides primary as well as secondary health care facilities.
- If a patient is not been able to managed by these centers then they are referred to the tertiary hospitals.

Tertiary health care:

Hospitals which have advanced level equipments and medicines and can undertake all the complicated health problems which could not be managed by primary or secondary hospitals comes under tertiary health care institutions.

Example: AIIMS (All India Institute of medical science) in Delhi

Development of health services in India:

After independence the health services in India has increased in a remarkable way, the increment can be easily seen by the following indicators of good health.

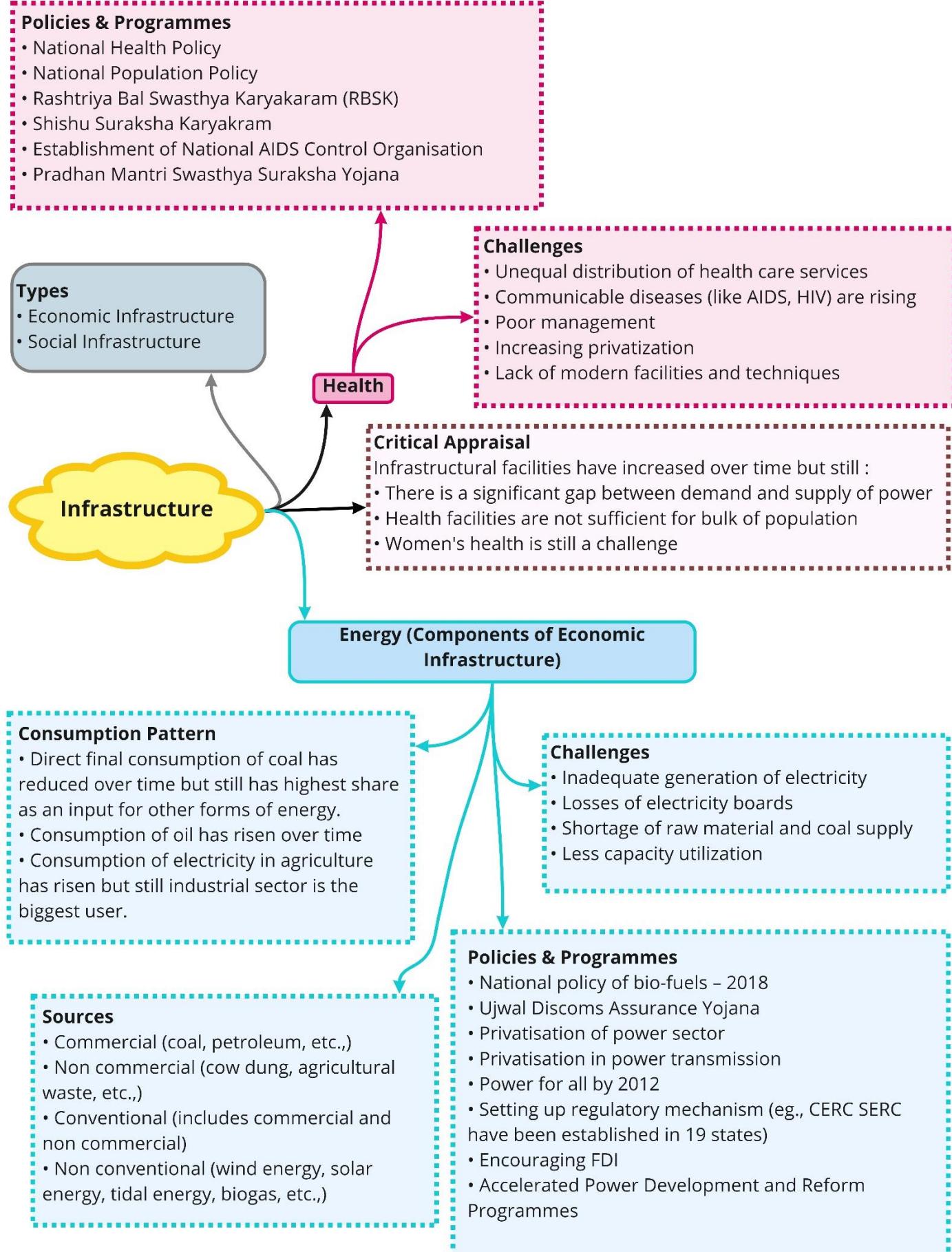
- **Decline in Death rate:** Death rate refers to the number of people dying per thousand persons in a year. Death rate has declined from 27 per thousand in 1951 to 6.4 per thousand in 2016.
- **Rise in life expectancy:** The expectancy of life has increased from 32 in 1951 to 68.3 in 2016.
- **Decrease in infant mortality rate:** Infant mortality rate refers to the number of infants dying before the age of 1 year per thousand live births annually. Infant mortality rate has decreased from 146 in 1951 to 34 in 2016.
- **Control over deadly diseases:** Diseases like smallpox, smallpox and cholera have been controlled. Health as an emerging challenge. As we had studied earlier that the health sector of our economy is developing with great pace. Yet, the health care in India is still a challenge for the government of the country due to following reasons.
- **Unequal distribution of health care services:** The services of health care are not distributed equally across the rural and urban areas of the economy. Most of the services are only found in urban areas, leaving behind the rural section of the society.
- **Increasing privatization of health services:** Although the increment in the role of private sector in health sector speeds up the pace of treatment but also increases the cost of handling the patient. Being a developing country, the majority of the public prefers low-cost treatment which can only be provided by the government sector.
- **Poor sanitation level:** Sanitation refers to public health conditions related to clean drinking water and adequate treatment and disposal of human excreta and sewage. The level of sanitation is very low in both rural and urban sectors of the economy. However, in the past few years, the concept of Swachh Bharat Abhiyan helps in increasing its level.
- **Poor management of government health centers:** The increase in the role of private sector in health sector is due to the quality difference between private and government hospitals. The maintenance and upkeep of the government hospitals is

very poor due to which the public is compelled to depend upon the private hospitals.

Summary:

- Concept of infrastructure
- Kinds of infrastructure
- Economic infrastructure
- Socialist infrastructure
- Importance of infrastructure
- Increases productivity
- Provides employment opportunities
- It facilitates the functioning of an economy
- Promotes economic growth
- Improves quality of life
- Facilitates outsourcing
- State of infrastructure in our country (till 2010)
- Commercial sources of energy
- Non-commercial sources of energy
- Conventional sources of energy
- Non-conventional sources of energy
- Power/electricity
- Sources of power generation
- Thermal power
- Hydro and wind power
- Nuclear power
- Challenges in power sector
- Transmission and distribution loss
- Insufficient installed capacity
- Under utilization of capacity
- Shortage of raw materials
- Poor performance of State electricity boards
- Lack of public cooperation/public unrest
- Measures to overcome challenges of power sector
- Reduce transmission and distribution loss
- Improve plant load factor
- Increase the supply of inputs
- Promote the use of CFL and LEDs.
- Encourage FDI and privatization of power generation

- State of health infrastructure
- Development of health services in India
- Health as an emerging challenge



Important Questions

Multiple Choice questions-

Q1. Which of the following is a commercial source of energy?

- (a) Coal
- (b) Agricultural waste
- (c) Animal dung
- (d) Firewood

Q2. The power generated from water is called

- (a) Thermal Power
- (b) Hydroelectric Power
- (c) Atomic Power
- (d) Tidal Power

Q3. From which of the following sources of generation we get the largest amount of power?

- (a) Thermal Power
- (b) Hydroelectric Power
- (c) Atomic Power
- (d) Tidal Power

Q4. Which of the following statements is not correct with regards to infrastructure?

- (a) Infrastructure contributes to economic development.
- (b) Infrastructure provides support services.
- (c) All infrastructural facilities have a direct impact on the production of goods and services.
- (d) Inadequate infrastructure can have multiple adverse effects on health.

Q5. Which of the following facilities is included in social infrastructure?

- (a) Roads and highways
- (b) Housing
- (c) Internet
- (d) Electricity

Q6. What is morbidity?

- (a) Proneness to fall ill
- (b) High infant mortality rate
- (c) High maternal mortality rate

(d) Low life expectancy

Q7. What percent of rural households use bio-fuels for cooking?

(a) 50 percent

(b) 75 percent

(c) 80 percent

(d) 90 percent

Q8. Which of the following sector was the largest consumer of commercial energy in 1953-54?

(a) Households

(b) Transport

(c) Industries

(d) Agriculture

Q9. Which of the following is not a function of primary health care?

(a) Spreading education concerning prevailing health problems

(b) Promoting food supply and proper nutrition

(c) Conducting research

(d) Providing essential drugs

Q10. Which of the following systems is not included in the Indian System of Medicines?

(a) Allopathy

(b) Homeopathy

(c) Naturopathy

(d) Ayurveda

Q11. From the following which is not a commercial source of energy

(a) Petroleum

(b) Coal

(c) Electricity

(d) Dried dung

Q12. Indian system of medicine:

(a) Unani

(b) Yoga

(c) Siddha

(d) All of these

Q13. Electricity generated from radioactive elements is called:

- (a) Thermal electricity
- (b) Atomic energy
- (c) Hydel electricity
- (d) Tidal energy

Q14. The state known as 'God's own country'

- (a) Karnataka
- (b) Gujarat
- (c) Kerala
- (d) Goa

Q15. Energy generated by sun is known as:

- (a) Natural gas
- (b) Solar energy
- (c) Wind energy
- (d) Electricity

Very Short:

Question 1. What is social infrastructure?

Question 2. Give examples of social infrastructure.

Question 3. What constitutes economic infrastructure?

Question 4. What type of fuels do rural women use to meet their energy requirements?

Question 5. What percentage of rural population has access to improved sanitation?

Question 6. What are the commercial sources of energy? Give examples.

Question 7. What is the share of nuclear sources in the world's total energy generation?

Question 8. Is CFL better than ordinary bulbs? Why?

Question 9. Name the two leading private sector companies that distribute electricity in Delhi.

Question 10. Which organisation monitors the power tariff structure in Delhi?

Short Questions:

Question 1. Explain the significance of social infrastructure.

Question 2. Why is it important to have strong infrastructure?

Question 3. Compare and contrast India with China and Pakistan on the basis of infrastructural development.

Question 4. How is the national income of a country related to the level of infrastructural development? Explain.

Question 5. Represent the relative share of different sources of energy generation in India with the help of a pie diagram?

Question 6. Which sources of energy are encouraged by India's energy policy? Why?

Question 7. What problems are faced by State Electricity Boards?

Question 8. Highlight the points that reflect development in the health services after independence in India.

Question 9. Mention some premier institutions that provide specialised health care in India.

Question 10. Give an account of the contribution of community and non-profit organisations to health care in India.

Long Questions:

Question 1. Why is it important to conserve energy?

Question 2. Solar energy, wind power and power produced from tides are going to be future sources of energy. What are their comparative merits and demerits?

Question 3. Discuss the state of health infrastructure in rural areas of India.

Question 4. Explain the three-tier system of health infrastructure and health care in India.

Case Study Based Question-

1. Read the following hypothetical text and answer the given questions: -

Over years India's soft infrastructure grew much faster than the hard infrastructure. For example, India's rising trade has been reflected in growing container port traffic, which increased from less than a million in 1991 to about 5 million in 2005 with an annual growth rate of about 266% since 1991. In contrast, hardware components, like railway, roadways and airways witnessed little expansion in last one and half decades. In general, performances of these sectors (hardware) are never the less poor, when counted their densities in terms of country's surface area of population. Densities in terms of access or spread of rail and road length clearly indicate that road sector has been successful, compared to railways, in spreading the network as well as providing and assessing in the economy. In order to unleash India's full potential development of hardware component of India's physical infrastructure perhaps deserves utmost attention. This also indirectly indicates high investment potentials in roadways, railways, power and the associated components in India.

Questions:

1. Infrastructure contributes to growth and development on account of which of the Following:
 - (a) it promotes productivity
 - (b) it generates linkages in production

(c) it reduces the size of the market

(d) both A and B

2. The infrastructure referred to in the above paragraph is _____ . (social /economic infrastructure).

3. Social infrastructure includes:

(a) roads

(b) health infrastructure

(c) railways

(d) airways

4. Economic infrastructure leads to growth in human development. (True or False).

2. Read the following hypothetical text and answer the given questions: -

Infrastructure is one of the most important backbone of any economy. Development of infrastructure leads to proper growth of the economy, social infrastructure like health and education helps indirectly in growth of the economy. Social infrastructure, like health and education helps indirectly in growth of GPD and Physical Infrastructure helps directly. They both help in solving the problem of unemployment. Thus, the government needs to focus on improving the social infrastructure of the economy at large. Expenditure in Health and education leads to the development of the Human capital and enables the better supply of work force which is both healthy and skilled. With regard to physical infrastructure like roads and railways help to foster the growth of Industries, all small scale, medium scale and large scale industries. As the population of India is large, so in order to remove the disguised unemployment, government has set up committees aimed at helping the development of small scale industries and villages as they are more labour intensive unlike the large scale industries. One such committees was Karve Committee constituted in 1955 which witnessed the potential of utilizing small scale industries for promoting rural development.

Questions:

1. Social infrastructure helps in production and distribution:

(a) In direct form

(b) In indirect form

(c) In no way

(d) In Both (a) and (b)

2. _____ (Health expenditure/Food for All/Skill Development Programme) directly increases the supply of healthy labour force.

3. Which type of unemployment is more in india:

(a) Open unemployment

(b) Disguised Unemployment

- (c) Seasonal unemployment
- (d) Educated unemployment

4. In 1955, Karve Committee was constituted for aiming the _____.

- (a) Development of Small Scale industries
- (b) Development of Large Scale industries
- (c) Feasibility of LPG
- (d) Development of infrastructure

Assertion Reason Type Question-

1. In these questions, a statement of assertion followed by a statement of reason is given. Choose the correct answer out of the following choices.

- a. Both Assertion and Reason are true and Reason (R) is the correct explanation of Assertion (A)
- b. Both Assertion and Reason are true and Reason (R) is not the correct explanation of Assertion (A)
- c. Assertion (A) is True but Reason (R) is False
- d. Assertion (A) is False but Reason (R) is True

Assertion: There exist a positive correlation between economic growth and demand for energy.

Reason: Growth is an index of increasing productive activity, which requires a large quantity of energy.

2. In these questions, a statement of assertion followed by a statement of reason is given. Choose the correct answer out of the following choices.

- a. Both Assertion and Reason are true and Reason (R) is the correct explanation of Assertion (A)
- b. Both Assertion and Reason are true and Reason (R) is not the correct explanation of Assertion (A)
- c. Assertion (A) is True but Reason (R) is False
- d. Assertion (A) is False but Reason (R) is True

Assertion: It is imperative to develop the status of both social and economic infrastructure.

Reason: It enhances overall productivity and expands the dimensions of economic development.

Answers key

MCQ answers:

1. (a) Coal
2. (b) Hydroelectric Power
3. (a) Thermal Power
4. (c) All infrastructural facilities have a direct impact on the production of goods and services.
5. (b) Housing
6. (a) Proneness to fall ill
7. (d) 90 percent
8. (b) Transport
9. (c) Conducting research
10. (a) Allopathy
11. (d) Dried dung
12. (d) All of these
13. (b) Atomic energy
14. (c) Kerala
15. (b) Solar energy

Very Short Answers:

1. Answer: Social infrastructure consists of facilities and systems that are necessary to ensure safe, healthy and productive life to the people in the community.
2. Answer: Social infrastructure includes:
 - (i) Education
 - (ii) Health
 - (iii) Housing
3. Answer: Economic infrastructure consists of energy, transportation and communication.
4. Answer: Rural women use bio-fuels such as crop residues, dung and fuel wood to meet their energy requirement.
5. Answer: Only 20 percent of rural population has access to improved sanitation.
6. Answer: Commercial sources of energy are those sources which are exchanged for money. Coal and petroleum are commercial sources of energy.
7. Answer: The share of nuclear sources in the world's total energy, generation is 13 percent.
8. Answer: CFLs are better than 100-watt bulbs as the former consumes 80 percent less power as compared to the latter.

9. The two leading private sector companies that distribute electricity in Delhi are:

- (i) Reliance Energy Limited
- (ii) Tata – Power Limited (NDPL)

10. Delhi Electricity Regulatory Commission (DERC) monitors the tariff structure and other regulatory issues in Delhi.

Short Answers:

1. Answer: The significance of social infrastructure lies in the following:

- (i) It helps in the healthy and robust growth of the young generation so that they become an efficient manpower tomorrow.
- (ii) Social infrastructure helps in the growth of literacy, which in turn helps in the growth of the society.
- (iii) Social infrastructure helps in the skill formation, which is an important parameter in the context of economic growth.
- (iv) It helps in improving and providing a quality life to the people.
- (v) Social infrastructure helps in the formation of human capital, which complements the physical capital to form an efficient system of growth and development

2. Answer: Infrastructure is the support system of the economy. All the sectors of the economy – agriculture industry, trade and commerce – greatly depend on the social and economic infrastructure for rapid and vast economic development. It is a network of public services, physical and social facilities that increases the efficiency of factors of production and improves the quality of people's life. Thus, infrastructure plays a vital role in the economic development of a country.

3. Answer: The table below compares India's position with its neighbouring countries on the basis of infrastructural development:

Country	China	India	Pakistan
Investment in Infrastructure as a percentage of GDP – 2014	46	34	15
Access to Improved Water Source (%) – 2015	96	94	91
Access to Improved Sanitation (%) – 2015	77	40	64

Users of Mobile Phones per hundred person – 2015	93	79	70
Power Generation (billion kwh) – 2016	6015	1423	105

Source: World Development Indicators, 2017, data pertaining to 2014

In case of investment in infrastructure, as a percentage of GDP, China is far ahead of India and Pakistan. While China invests 46 per cent of its GDP in infrastructure, India and Pakistan invest only 34 and 15 per cent of their GDP respectively.

Access to drinking water is more or less the same for all the three nations, Power production is much better in China as compared to Pakistan and India. Modernisation process is faster in China compared to India and Pakistan. There 93 persons out of one hundred use mobile phones in China, In India 79 and in Pakistan only 70 out of one hundred persons were mobile users.

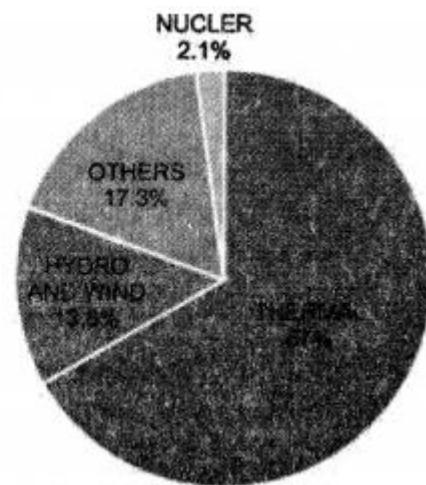
Thus, when we compare the development experience in terms of infrastructural development of these countries, we found that China is much ahead of India and Pakistan.

4. Answer: The composition of infrastructure requirements changes significantly with the increase in country's national income. Basic infrastructure facilities such as irrigation, transport and power are more important for low-income countries.

However, as economies grow and they are able to satisfy their basic consumption demand, the share of agriculture in the economy shrinks and more service related infrastructure become important. Thus, the share of power and telecommunication infrastructure is greater in high-income countries.

5. Answer :

Source	Power Generation Capacity (%)
Thermal	67
Hydro and Wind	13.6
Nuclear	2.10
Others	17.30
Total	100



6. Answer: India's energy policy encourages hydel and wind energy as India has great potential in the use of a renewable source of energy. The use of renewable energy sources can ensure additional supply of power. Moreover, these sources do not rely on fossil fuel and hence, avoid carbon emissions. Greater reliance on renewable energy resources offers enormous economic, social and environmental benefits.

7. Answer: The following problems are faced by State Electricity Boards:

- SEBs suffer transmission and distribution losses, thereby making the economics of power generation completely unbalanced.
- The pattern of investments being made in power generation is inappropriate. It leads to sharp increase in the cost per unit of electricity.
- The high cost of power imposed on the industry, which is the backbone of the SEBs, is hindering the grid in gaining control and hence, worsening the crisis of the SEBs.

8. Answer: The following points reflect development in the health services after independence in India:

- Decline in Death rates: Death rate has come down from as high as 27.4 per thousand in 1951 to 6.3 per thousand in 2015.
- Reductions in Infant Mortality: Infants mortality rate has significantly reduced from 140 per thousand in 1951 to 32 per thousand in 2015.
- Rise in Life Expectancy: Expectancy of life has risen from 50 years in 1951 to 68.3 years in 2015.

9. Answer : Some premier institutions that provide specialised health care in India are:

- All India Institute of Medical Science (AIIMS), New Delhi
- Post Graduate Institute, Chandigarh
- Jawaharlal Institute of Postgraduate Medical Education and Research, Pondicherry
- National Institute of Mental Health and Neuro Sciences, Bangalore
- All India Institute of Hygiene and Public Health, Kolkata.

10. Answer: Community participation functions with the idea that the people can be trained and involved in primary healthcare system. Trade unions have built health care services to give low-cost health care to their members as well as to the people from nearby villages.

For instance, Shahid Hospital was built in 1983 and is sustained by the workers of Chhattisgarh Mines Shramik Sangh in Durg, Madhya Pradesh. SEWA in Ahmedabad and ACCORD in Nilgiris are examples of some non-profit organisations that contribute to health care in India.

Long Answers:

1. Answer: It is important to conserve energy due to the following reasons:

- (i) Resources are limited. India has only 1 percent of world's energy resources but it accounts for 16 percent of world population.
- (ii) Resources take long time for formation. Coal and petroleum are the most widely used sources of energy. They take thousands of years for formation.
- (iii) Resources are non-renewable. Non-renewable resources are those which get exhausted with extraction and use. Non-renewable energy sources constitute 80 percent of the fuel use. If we continue to use such resources at present rate, these will be soon depleted.
- (iv) Use of resources involves high cost. About 75 percent of our crude oil needs depend on imports, which cost about ₹ 1,50,000 crore a year. The cost is passed on to the consumers by means of higher prices of goods and services.
- (v) Environment needs protection. Sources which rely on fossil fuel emit huge amounts of carbon dioxide in the atmosphere. Energy production accounts to large proportion of air pollution and more than 83 percent of greenhouse gas emissions. According to a wise saying – “The earth, water and the air are not a gift to us from our parents but a loan from our children. Hence, we need to make energy conservation a habit.”

2. Answer: Merits of Solar Energy:-

- (i) It is available free of cost.
- (ii) It is a renewable source of energy.
- (iii) It does not cause pollution.
- (iv) Solar energy can be used in remote areas where it is too expensive to extend the electricity power grid.
- (v) Everyday items such as calculators and other low power consuming devices can be powered by solar energy effectively.

Demerits of Solar Energy :-

- (i) Solar energy can be harnessed only during daytime.

- (ii) It cannot be obtained during rainy days.
- (iii) Solar collectors, panels and cells are relatively expensive.
- (iv) Large areas of land are required to capture the sun's energy.

Merits of Wind Power :-

- (i) Wind power is an inexhaustible source of energy and is virtually a limitless resource.
- (ii) Energy is generated without polluting environment.
- (iii) It has tremendous potential to generate energy on large scale.
- (iv) Wind power can be used directly as mechanical energy.

Demerits of Wind Power :-

- (i) Wind power requires expensive storage during peak production time.
- (ii) It requires large open areas for setting up wind farms.
- (iii) It is an unreliable source as winds are uncertain and unpredictable.
- (iv) The problem of noise pollution is usually associated with wind mills.

Merits Tidal Power :-

- (i) Tidal energy is completely renewable.
- (ii) It is a relatively reliable source of energy.
- (iii) A tidal barrage has a very long life of around 100 years.
- (iv) It is free from pollution.
- (v) Its costs are extremely low.

Demerits of Tidal Power :-

- (i) It requires massive investment to construct a tidal barrage or dam.
- (ii) It has adverse effect on marine life.
- (iii) It is difficult to transmit electricity generated from tides.

3. Answer: The following points highlight the state of health infrastructure in rural areas of India:

- (i) People living in rural areas do not have sufficient medical infrastructure as
 - only one-fifth of the country's hospitals and only about half the number of dispensaries are located in rural areas; and
 - out of 6.3 lakh beds in the entire country, only 30 percent are available in rural areas.
- (ii) There are only 0.36 hospitals for every one lakh people in rural areas.
- (iii) The PHCs located in rural areas do not provide basic facilities such as X-ray or blood testing.

(iv) In rural areas, the percentage of people who have no access to proper care has increased over the last few years.

(v) Rural population has no access to any specialised medical care such as paediatrics, gynaecology, anaesthesia and obstetrics.

4. Answer: The three-tier system of health infrastructure and health care in India is as below:

(i) Primary Health Care: It includes education related to existing health problems and methods to identify, prevent and control them. It also constitutes promotion of food supply and proper nutrition; adequate water supply and sanitation; maternal and child health care; etc. In order to provide primary health care, Primary Health Centres (PHC), Community Health Centres (CHC) and sub-centres have been set up in villages and small towns.

(ii) Secondary Health Care: When PHCs are unable to manage the condition of a patient, they are referred to secondary hospitals. Secondary health care institutions include hospitals which have better facilities for surgery', X-ray and Electro Cardio Gram (ECG). They are mostly located in district headquarters and big towns.

(iii) Tertiary Health Care: Hospitals under the tertiary sector have advanced level equipment and medicines. They undertake all the complicated health problems, which could not be managed by primary or secondary hospitals. This sector also includes many premier institutes, which provide specialised health care not along with imparting quality medical education and conducting research.

Case Study Answer-

1. Answer:

1. d) both A and B
2. economic infrastructure
3. b) health infrastructure
4. false

2. Answer:

1. b) In indirect form
2. Health expenditure
3. b) Disguised Unemployment
4. a) Development of Small Scale industries

Assertion Reason Answer-

1. a) Both Assertion and Reason are true and Reason (R) is the correct explanation of Assertion (A)
2. b) Both Assertion and Reason are true and Reason (R) is not the correct

explanation of Assertion (A)