CHAPTER-III

WATER RESOURCES

2 MARK QUESTIONS

1.Explain how water becomes a renewable resource?

ANSWER:

With freshwater from surface runoff and groundwater being renewed and recharged, through the hydrological cycle, water continues to be renewed.

2.What is water scarcity and what are its main causes?

ANSWER:

Water scarcity means non-availability or less availability of water. It is caused by exces¬sive use of water, over-population, and greater demand of water.

3.What is water scarcity?

ANSWER:

When the availability of water is less than 1000 cubic metre per person per day, it is known as water scarcity.
Main causes for water scarcity are:

(a) Variations in seasonal and annual precipitation
(b) Rapid growth of population
(c) Polluted water and unequal access to the population
(d) Over-exploitation to expand irrigated area

4.From your everyday experiences, write a short proposal on how you can conserve water.

ANSWER:

i. Don’t over-use water.
ii.Turn the tap off, when it is not in use.
iii. Reuse kitchen water for gardening.

5.Make a list of inter-state water disputes.

ANSWER:

i.Krishna-Godavari water dispute between Karnataka and Andhra Pradesh.
ii.Kaveri water dispute between Tamil Nadu and Karnataka
iii.Krishna water dispute between Maharashtra, Karnataka and Andhra Pradesh.
iv.SYL between Punjab and Haryana.
v.Indus water dispute between India and Pakistan

6. What is watershed development?

ANSWER:

Water is the basin of the Samar tributary. There may be a small river in it. It may or may not happen, but whenever it rains, water flows through there and eventually gets mixed in some river or the other. Thus watershed is a geomorphic unit and it is conveniently used for integrated development in small natural unit areas.

7. What is rainwater harvesting?

ANSWER:

Rainwater harvesting is a technique to increase the capacity of underground water. In this, special structures such as wells, dams, etc. are constructed to trap and collect rainwater. It not only stores water, but also creates favorable conditions for water to go underground.

8 What is River Valley Project?

ANSWER:

Such projects are implemented by making dams for flood control, hydroelectricity construction, water supply, Singat rivers, river ghat management, etc., with the objectives called projects.

4 MARK QUESTIONS

1.Discuss how rainwater harvesting in semi-arid regions of Rajasthan is carried out?

ANSWER:

Rainwater harvesting in semi-arid and arid regions of Rajasthan is carried out through underground tanks for storing drinking water. These tanks are made part of the well-developed rooftop rainwater harvesting system which are built inside the main house of the courtyard.

They are connected to the sloping roofs of the houses and through a pipe. Rain falling in the rooftops travel down the pipe and is stored in these under¬ground tankers. The first spell of rain is usually not collected as this would clean the roof and the pipe. The rainwater from the subsequent showers is than collected for the purpose.

2.Describe how modem adaptations of traditional rainwater harvesting methods are being carried out to converse and store water.

ANSWER:

Dams help us conserve, store and manage water. They were traditionally built to im¬pound rivers and rainwater that could be used later to irrigate agricultural fields. Thirdly, they are not just built for irrigation, but they are there for generating electricity water, supply for domestic and industrial use, flood control, recreation, inland navigation and they are now for multipurpose objects. These replace the traditional adaptations of methods conserving and managing water.

3.Find out more about any one traditional method of building dams and irrigation works.

ANSWER:

Since time immemorial, people were aware of the importance of preserving the natural resources like water. Hence, they devised techniques to harvest rainwater, river water, groundwater, and flood water while maintaining the ecological conditions with their water needs.

i. In hilly and mountainous regions, people built diversion channels, for agriculture, like the 'guls' and 'kuls' in the Western Himalayas.
ii. To store drinking water, especially in Rajasthan 'Rooftop rainwater harvesting' was practised.
iii. In the flood plains of Bengal, to irrigate the fields inundation channels were developed.
iv. Agricultural fields in the arid and semi-arid regions, were converted into storage structures that allowed rain water to collect and moisten the soil examples are the 'khadins' in Jaisalmer and Johads and Tankas in other parts of Rajasthan.

4.Collect information on how industries are polluting our water resources.

ANSWER:

Normally, water pollution is caused through the discharge of domestic and industrial wastes into water that affects water quality. The industrial wastes, chemicals, pesticides and fertilisers used in agriculture make it more hazardous for human use. These uses have affected the quality and quantity of water in the following ways:

i. Our villages particularly suffer on account of the quality of water available for domestic use. About half of our villages are yet to be provided with safe drinking water.
ii. Most of India's rivers, especially the tributaries of the main river have become sinks of domestic and industrial wastes. The Supreme

Court, in a recent judgement, described river Yamuna as the 'City's Drain'.

iii. Today, most rivers are health hazards, threatening the health and livelihoods of many people.

iv. Water contamination and deteriorating water quality have caused degradation of our natural ecosystems.

v. Over-exploitation and mismanagement of water have impoverished our resource base and caused ecological crises

5. Find out other rainwater harvesting systems existing in and around your locality.

ANSWER:

As I live in a hot place, in our locality, ground is being dug at many places to harvest rainwater. It has many advantages such as:

- 1. It helps to store water when it rains so that when there is scarcity of water, the stored water can help.
- 2. It is easy to maintain.
- 3. It reduces water bills as water collected in the rainwater harvesting system can be used for many non-drinking functions as well. For example, washing clothes and watering plants.

6.Compare the advantages and disadvantages of multipurpose river projects?

ANSWER:

Multi-purpose river projects have their merits and demerits. Nehru would call them us temples of modem India. They have led nation to development and progress, industrialisation. They have also led to poor sediment flow and excessive sendimentation at the bottom of the reservoir, leading to soil decomposition. Numerous social movements have been directed and launched to these problems.

7. Explain how water is a renewable resource.

ANSWER:

Renewable resources are those which can be used again and again. According to this definition, water is also a renewable resource. Water evaporates from oceans, rivers, lakes, fields, etc. Eventually, when these vapors cool down, they again come to the earth in the form of rain. This water cycle makes water a renewable resource. Which can be used repeatedly.

8.Describe the importance of water in life.

ANSWER:

Following are the importance of water in life-

(a) Water is essential for the existence and development of humans, plants, and animals.

(b) Water as a sea route is an important means of transport.

(c) Water is a means of irrigation.

(d) Water is used by humans for drinking, cooking, washing clothes, and other domestic purposes.

(e) Hydroelectricity is made from water.

7 MARK QUESTIONS

1. From your everyday experiences, write a short proposal on how you can conserve water.

ANSWER:

We can conserve water at home and in the school by the following methods:
1. Do not leave the tap running while brushing your teeth or washing your face.
2. Use a bucket for bathing, not a running tap.
3. Do not flush the toilet unnecessarily
4. Ensure all the taps have no leakage.
5. Water which has been used for washing vegetables, dal, rice, etc., should not be thrown away. It can be used for watering potted plants or garden plants.
6. Promote water conservation by forming a group of water conscious people with friends and neighbours.
7. Hold regular meetings and exchange ideas promoting water conservation.
8. Repair leakage of taps and pipes.
9. Use a mug instead of a pipe while washing car, bikes and other vehicles.

2. Write 8 advantages of rainwater harvesting.

ANSWER:

Benefits of rainwater harvesting-

- (a) By cleaning it, the drinking water requirement of the local people can be met.
- (b) This water can also be used to irrigate fields in times of scanty or no rainfall.
- (c) One advantage of this water is also that the level of water below the surface remains high so that water can be taken out through wells and tap wells and used.
- (d) As a result of water harvesting in this way, there is not so much burden on the drainage system of dirty water in the cities. When there are so many benefits of rainwater harvesting then people especially rural people should take full advantage of it. According to an estimate, an ordinary village of ours can store 3.75 billion liters of water on some 340 hectares of land and avoid drought conditions and famine conditions.

3. What is a dam? How are they helpful in the conservation and management of water?

ANSWER:

A dam is a reservoir in general. It is constructed to stop the flowing water, to change the direction of the water, etc.

- The dam has a slope through which water flows. Dams are constructed across rivers and rainwater is collected in the low-lying plains. This collected water is transported to Khela through canals. Thus dams play an important role in water conservation and management.
- In ancient India, dams existed at places like Kalinga (Orissa), Nagarjuna Konda (Andhra Pradesh), Vennur (Karnataka), etc. In the modern period, the Heeraku project on the Mahanadi, the Bhakra project on the Sutlej River, the Kosi project on the Kosi River, etc. are major dams. Multipurpose River Valley

4 What is meant by a multipurpose project? Why have these projects been called the temples of modern India? Explain.

ANSWER:

For the development of agriculture and industries in India, the central and state governments made several schemes for flood control, expansion of irrigation facilities, and development of hydroelectricity. After assessing the capacity of flowing water, with its cooperation, detailed plans were prepared to fulfill several objectives at the same time. The river valley projects which serve multiple purposes at the same time are called multipurpose projects.

India's first Prime Minister Pandit Jawaharlal Nehru has called multipurpose projects 'temples and pilgrimage sites of modern India', because they serve many purposes simultaneously, the main ones are as follows-

(a) Flood control and soil conservation- Before the river valley projects, floods were a common phenomenon during the rainy season, which caused huge losses of people and money. Precious soil used to flow away. Agricultural development depends on the soil. To solve this burning problem, by making dams on the rivers, and by controlling the intensity of the flow, the river valleys have achieved success in conserving the soil.

(b) Expansion of irrigation facilities Big lakes have been constructed behind the dams on the rivers. Rain water gets collected in these. When water is needed in the dry season, this water is put to good use for irrigation by canals. The expansion of irrigation facilities has led to the expansion of agriculture and agricultural productivity has increased manifold. Two to three crops have started being taken from one field in the rainy season.

(c) Construction of hydroelectricity Due to the construction of dams, the flowing water is dropped from a height, with the help of which hydroelectricity is generated. It is a clean, neat, and pollution-free form of energy.

(d) Industrial development- The development of industries depends on regular and cheap power. With these schemes of industries, water is available in sufficient quantity along with the availability of power.

(e) Water transport facility- Inland water transport facility is available in main rivers and canals under multipurpose river valley projects. It is the cheapest mode of heavy transport.

(f) Freedom from drought and famine – Irregularity and uncertainty of rainfall remain the same. Drought due to less rainfall and submergence of crops due to excess rainfall are common things. In both cases, there is famine. Famine can be saved by sending water to drought-prone areas and making arrangements for the drainage of excess water from flood-prone areas.

5. Mention any five advantages of multipurpose projects.

ANSWER:

The following are the benefits of multipurpose projects-

(a) Irrigation facilities have increased through multipurpose projects and the land which was previously lying barren has now been irrigated by providing water through canals and millions of quintals of food grains have started being produced.

(b) These large dams have made a special contribution to checking the velocity of floods and saving people from destruction.

(c) These dams have saved people from hunger and famine. Earlier, countless people used to die of hunger and famine, now they have been given life because of these big dams.

(d) These dams have made a very important contribution to running our factories and generating electricity for our convenience. Without electricity neither the essential things are available to us nor our life would be so prosperous and happy.

(e) Due to these dams, fish farming has also been facilitated.

6.Why is conservation and management of water resources necessary? What needs to be done about this?

ANSWER:

Water is the basis of life. The availability of water on Earth is limited. Therefore, the conservation and management of water are necessary. Conservation and management of water are also necessary because the limited amount of water available is getting polluted due to various reasons. Presently water crisis has become a serious problem. Which can be resolved through proper conservation and management of water sources. For this, the following steps should be taken-

- (a) Construction of more reservoirs to store more water.
- (b) Increase in underground water.
- (c) Creating a river water grid.
- (d) Collecting rainwater.
- (e) Adoption of water recovery technique.

7. How is water conservation and storage being done by adopting traditional methods of rainwater harvesting in modern times?

ANSWER:

Wells, lakes, ponds, step-wells, etc. are the methods of post-conventional rainwater harvesting. are prominent. Water conservation and storage were done by adopting these methods in the villages.

going. The traditional method of rooftop rain harvesting is very successful in collecting drinking water in western Rajasthan.

Today when the water level in the cities is decreasing rapidly. Rooftop rainwater harvesting has become imperative. The rainwater goes from the roofs to the sea through drains and rivers. If the rainwater falling on the roofs is stored in our land, then the problem of falling water levels can be solved.

8.Describe the methods adopted for water harvesting in ancient India.

ANSWER:

In ancient India, in the semi-arid and arid regions of Rajasthan, especially in Bikaner, Phalodi, and Barmer, almost every house had an underground tank or 'tanka' to store drinking water. Its size can be equal to a large room.

A house in Phalodi has a tanka 6.1 m deep, 4.27 m long, and 2.44 m wide. Tanka is here an integral part of a well-developed rooftop rainwater harvesting system which is built into the main house or courtyard. These are connected by pipes to the sloping roofs of the houses. Rainwater from the roof passes through these taps to an underground tank where it is collected.

The first rainwater is used to clean the roof and taps. It is not stored. After this, rainwater is collected. Because this water is pure and clean.

MULTIPLE CHOICE QUESTIONS

1) The freshwater is mainly obtained from surface runoff and groundwater that is continually being renewed and recharged through the _____.

a) Sulfur cycle

b) Rock cycle

c) Hydrological cycle

d) None of the above

Answer: Option (c)

2) 96.5 per cent of the total volume of the world's water is estimated to exist as ____ and only 2.5 per cent as _____.

a) Freshwater, oceans

b) Oceans, freshwater

c) Groundwater, oceans

d) None of the above

Answer: Option (b)

3) Nearly 70 per cent of freshwater occurs as ice sheets and glaciers in _____, Greenland and the mountainous regions of the world.

a) Antarctica

b) Siberia

c) Alaska

d) Russia

Answer: Option (a)

4) A little less than _____ of freshwater is stored as groundwater in the world's aquifers.

a) 5%

b) 20%

c) 10%

d) 30%

Answer: Option (d)

5) India ranks _____ in the world in terms of water availability per person per annum.

a) 133

b) 135

c) 17

d) 98

Answer: Option (a)

6) As per one of the Swedish experts, water stress occurs when water availability is between ____ and ____ cubic meters per person per year.

a) 900 and 1000

b) 1000 and 1600

c) 500 and 1000

d) 1650 and 2650

Answer: Option (b)

7) In India, _____ contributes approximately 22 per cent of the total electricity produced.

a) Tidal power

b) Nuclear power

c) Thermal power

d) Hydroelectric power

Answer: Option (d)

8) From ancient times, evidence of sophisticated irrigation works has also been found in Nagarjunakonda. It is located in _____.

a) Andhra Pradesh

b) Odisha

c) Karnataka

d) Tamil Nadu

Answer: Option (a)

9) In the 14th Century, the tank in _____ was constructed by Iltutmish to supply water to the Siri Fort area.

a) Jaipur, Rajasthan

b) Hauz Khas, Delhi

c) Bhopal, Madhya Pradesh

d) Surat, Gujarat

Answer: Option (b)

FILL IN THE BLANKS

1.The Hirakud project was built in **Mahanadi** basin.

2.Which one of the following is not a source of freshwater **Surface run off**

3.During whose reign were the dams, lakes and irrigation system built extensively **Chandragupta Maurya**

4.Nagarjuna Sagar Dam is built on which river **Krishna**

5.Which of the following multipurpose projects is found in the Satluj-Beas River basin **Bhakra Nangal Project**

SUMMARY

Water resources are natural resources of water that are potentially useful for humans, for example as a source of drinking water supply or irrigation water. 97% of the water on Earth is salt water and only three percent is fresh water; slightly over two-thirds of this is frozen in glaciers and polar ice caps.