



UNIT III
WATER RESOURCES

SOLUTIONS

TEXTUAL QUESTIONS & ANSWERS

Q1. Answer the following questions by choosing the correct option from the given alternatives:

(i) The percentage of fresh water available on the earth is approximately

- (a) 2
- (b) 3
- (c) 4
- (d) 5

Ans: (b) 3

(ii) Which of the following is India's share in the global precipitation?

- (a) 3%
- (b) 4%
- (c) 5%
- (d) 6%

Ans: (b) 4%

(iii) The highest utilisation of ground water is found in

- (a) Haryana
- (b) Punjab
- (c) Uttar Pradesh
- (d) Bihar

Ans- (b) Punjab

(iv) The practice of rainwater harvesting in Rajasthan is on the decline because

- (a) Rain water is dirty
- (b) Rainwater collection is costly
- (c) Ample water is obtained from the Rajasthan canal.
- (d) Amount of rainfall is very low.

Ans- (c) Ample water is obtained from the Rajasthan canal.



Q2. Answer the following questions briefly:

(i) Give one reason why the availability of fresh water in India varies over space and time.

Ans: The availability of fresh water in India varies over space and time because the spatial distribution of rainfall is very uneven, uncertain and confined to only 4 months.

(ii) What is Dam?

Ans: A **Dam** is a barrier across flowing water that obstructs, directs or retards the flow often creating a reservoir or a lake.

(iii) Why did Jawaharlal Nehru proclaim dams as ‘Temples of modern India’?

Ans: Jawaharlal Nehru proclaimed dams as ‘Temples of modern India’ because a number of Multi-Purpose Projects will help in water resource management and will lead the nation to development and progress.

(iv) Which region accounts for 60 percent of India’s total water resources?

Ans: The Indus, the Ganga and the Brahmaputra along with their tributaries have the largest catchment areas. The catchment areas altogether account for only one - third of the total area in the country and have 60 percent of the country’s total surface water resources.

(v) What is another objective of the Kosi project other than irrigation?

Ans: The objective of **the Kosi Project** other than irrigation is to protect Bihar and Nepal from flood.

(vi) Name the Lake formed by the Bhakra Nangal project.

Ans: The Lake formed by **the Bhakra Nangal Project** is the Govind Sagar.

(vii) Suggest one measure which would be helpful in conserving water resources of India?

Ans: Effective measures for the conservation of water should be adopted with the use of water saving technologies and methods. Prevention of water pollution, rainwater harvesting, water recycling and re-use etc. should be encouraged.



Q3. Answer the following questions in about 30 words:

(i) What are the two principal sources of fresh water on this planet?

Ans: **Rainfall and snowfall** are the two principal sources of fresh water on this planet.

(ii) Why does sea water have limited use?

Ans: **Sea water** has limited use because sea water is generally brackish or saline.

(iii) Give two reasons for the shortage of potable water in India.

Ans: The two reasons for the shortage of **potable water in India** are – Discharged of industrial effluents in the nearby fresh water sources like rivers. Disposal of Urban wastes into or near the sources of fresh water.

(iv) Name the two states that jointly undertake the Chambal project.

Ans: **Madhya Pradesh and Rajasthan** are the two states that jointly undertake **the Chambal Project**.

(v) Explain how urbanisation causes water scarcity.

Ans: **Urbanisation causes water scarcity due to -**

(a) The consumption of fresh water has been made increased by urbanisation.

(b) A bath by shower or in a tub would need many times more water than a bath using bucket and mug.

(c) The tradition of preserving fresh water in ponds and small tanks has also been neglected in urban centres.

(vi) Mention the activities associated with watershed management programme.

Ans: **Watershed management** includes conservation, regeneration and judicious use of land, water, plants and animals and human within a watershed.



(vii) **Why is it necessary to conserve water resources?**

Ans: Water is essential for all living beings. About 3% of the total water on the earth is available for human use. In fact, it supports various plants and animals species.

Water is used for various purposes such as domestic, agricultural, industrial and generation of electricity. No living things can survive without water, so it is necessary to conserve water resources.

(viii) **Explain how rainwater is harvested in the arid and semi – arid regions of Rajasthan.**

Ans – In semi – arid and arid regions, '**Rooftop rainwater harvesting**' was commonly practised to store drinking water and agricultural fields were converted into rain fed storage. In **Rajasthan**, almost all the houses kept underground tanks or '**tankas**' for storing drinking water. In this system of rainwater harvesting, rain falling on the rooftops is collected through a pipe and stored in the tankas.

(ix) **Name two states of India where rooftop rainwater harvesting is successfully practised.**

Ans: The two states of India where rooftop rainwater harvesting is successfully practised are Shillong and Tamil Nadu.

Q4. Answer the following question in about 150 words:

(i) **Write an account of the various sources of water in India.**

Ans: The various sources of water in India are:

(a) **Atmospheric water** - In India rainfall is the most widespread form of precipitation while snowfall is confined to limited areas particularly in the Himalayas. The average rainfall in the country is around 117cm in a year.

(b) **Surface water** - Surface water appears as rivers, lakes, ponds and tanks. In northern India, the catchment areas of the Indus, the Ganga and the Brahmaputra along with their tributaries account for only one – third of the total area in the country and have 60 percent of the country's total surface water resources. The remaining 40 per cent is shared by peninsular rivers. Besides, there are large and small fresh water lakes in different parts of the country.



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- (c) **Ground water** – Out of the total replenishable ground water resources, about 46 per cent is shared by the Ganga and Brahmaputra basins where ground water table is high. But most part of the peninsular plateau are deprived of the ground water due to hard impervious rocks and low water table.
- (d) **Ocean water** – Due to the projection of the Deccan peninsula into the Indian Ocean, a large part of India has a free access to sea and ocean. A number of lagoons, backwaters and lakes are formed due to indented coastline in some states. Such water bodies are generally brackish or saline and have limited use.

(ii) **Explain the different sources of irrigation used in India.**

Ans: The different sources of irrigation used in India are:

- (a) **Canals** – Canals are the most popular mode of irrigation in the plains, coastal and deltaic regions of India. They are found in Punjab, Haryana, Uttar Pradesh, Rajasthan, Bihar and Southern India. They cover over 36.5 % of the total irrigated areas.
- (b) **Wells and tube** – wells - Well irrigation is popular in areas where the level of sweet ground water is high. These areas include the plains of Punjab, Haryana, Rajasthan, Gujarat, Uttar Pradesh and the coastal plains. It occupies for more than half of the total irrigated areas in India.
- (c) **Tank irrigation** – Tank irrigation covers only 4.7 per cent of the total irrigated area of the country. It is practised mainly in peninsular India especially in Andhra Pradesh, Tamil Nadu, Karnataka and Kerala. It is also important in West Bengal and Orissa.

(iii) **Write an account of various utilities served by multi – purpose projects.**

Ans: The following are the various utilities served by Multi – Purpose Projects:

- (a) The traditional dams were built to impound rivers and rain water which can be used for irrigation
- (b) Such projects help in checking floods and protecting soil erosion.
- (c) These projects are meant for the generation of electricity, irrigation and domestic water supply as well as industrial uses.
- (d) These projects help in fish breeding and inland navigation.
- (e) These projects help in promoting tourism and recreational purposes.



(iv) Explain the adverse effects of the dams of multi – purpose projects.

Ans: The adverse effects of the dams of Multi – Purpose Projects are:

- (a) Damming of rivers affect the natural flow of the rivers resulting in sedimentation and rockier stream bed.
- (b) It makes the aquatic fauna difficult to migrate for spawning.
- (c) A large number of people have been displaced by the impounding water of the dam.
- (d) Multi – Purpose Projects and large dams have the cause of social movements like the Narmada Bachao Andolan, Tehri Dam Andolan etc.
- (e) Such projects submerge vegetation belts and agricultural fields.

(v) Write an account of five important multi – purpose projects of India.

Ans: Five important Multi – Purpose Projects of India are:

- (a) **The Bhakra Nangal Project** – It is constructed on the Sutlej as the joint venture of Punjab, Haryana, Rajasthan and Delhi. The Bhakra dam is the highest in the world. A large reservoir is formed by the dam and it is known as the Govind Sagar. It irrigates 1.4 million hectares of land and produces 1200 MW of powers.
- (b) **The Damodar Valley Project** – These projects has four dams on the river Damodar and its tributaries. It irrigates about 5.15 lakh hectares of land and has a total installed capacity of 1.181MW. It also helps in controlling floods in West Bengal. Besides, the left bank canal is navigable for a distance of 136 km.
- (c) **The Hirakud Projects** – The Hirakud dam is built on the river Mahanadi in Orissa and is the longest in the world. The project produces 270.2 MW of power and irrigates 2.5 lakh hectares of land.
- (d) **The Chambal Projects** – It is jointly undertake by Madhya Pradesh and Rajasthan. It irrigates 5.6 lakh hectares of land and produces 386MW of power.
- (e) **The Nagarjun Sagar Project** – This is the biggest river project in Andhra Pradesh. A dam was constructed near Nandikonda village. This project was made to ensure irrigation water in Khammam, Guntur and Kurnool districts.



EXTRA QUESTIONS AND THEIR ANSWERS

Answer the following questions:

Q1. Write the importance for practising rain water harvesting in India.

Ans: Rain water harvesting is low cost and eco-friendly for storage of water to use in needs. It checks declining of ground water level. Checks soil erosion and conserve water.

Q2. What causes water scarcity in India?

Ans: Water scarcity is caused in India due to increasing consumption because of increasing population, rapid urbanisation and following urban lifestyles, absence of traditional pond sand tanks, and introduction of water intensive crops, water pollution due to industrialisation, urbanisation and improper disposal of wastes, establishment of industries that need water for processing and cooling purposes.

Q3. Suggest measures for increasing potable water resources in India.

Ans: Potable water resources - Avoiding discharging of industrial effluents into sources of water, proper disposal of urban and other domestic wastes, encouraging water conservation bay way of introducing rainwater harvesting structures, re-use, re-cycling of water and checking of draining of contaminated water of modern agriculture into the fresh water bodies.

Q9. Draw a model of roof-top rain water harvesting structure.

Ans :



Fig. Diagram showing a model of roof-top rain water harvesting structure
