SHORT ANSWER QUESTIONS

EARTHQUAKES

1. Mention any three factors that contribute to the vulnerability of human population to earthquakes

Ans. Factors that contribute to vulnerability of human population:

Location of settlements in earthquake prone areas, area prone to landslides, or along geologic faults.

Dense collection of weak buildings with high cocupancy.

Buildings traditionally constructed using earth, rubble, bricks by masons, normally with heavy roofs. Heavy buildings are more dangerous.

2. Explain the four strategies to mitigate the effects of Earthquake.

Ans. Mitigation strategies of earthquake are:

To analyse soil type before construction, alluvial or wind blown soil is not favourable.

To follow building codes and guidelines published by Bureau of Indian Standards.

Building plans should be checked by the Municipality by laws.

Retrofitting techniques should be followed.

Public awareness is to be created through programmes for builders, Constructors engineers, masons, house owners etc.

3. What are the typical effects of an earthquake?

Ans. Typical effects of an earthquake are:

Physical damage: Loss or damage of buildings and service structure. Fire and floods due to dam failures. **Loss of life:** High casualties near epicenter and densely populated areas.

Transport network: Severely affected due to failures of roads, bridges and railway tracks etc.

Electricity and communication: All links are affected. Transmission towers, transformers, transponders, electricity poles may collapse.

LANDSLIDES

4. Discuss some mitigation strategies which can be adopted to minimise losses during landslides.

Ans. Mitigation strategies to minimise losses:

(a) Hazard mapping : Avoid slope prone areas for building settlements.

(b) Land use : Natural vegetation should be preserved. Denuded slopes to be reforested with trees. While constructing roads avoid blockage of natural drainage.

(c) Retaining walls : They can be built to stop land from slipping.

(d) Engineered structures : Strong foundations should be built to withstand ground movement forces. Underground pipes, cables etc. should be made flexible to withstand forces caused by landslides.

5. Explain landslides and its three typical harmful effects.

Ans. Landslides are slippery masses of rock, earth or debris which move by force of their own weight down mountain slopes due to heavy rainfall and steep slopes.

Harmful effects of landslides:

(a) Landslides cause devastating damage to road transport and communication network.

(b) Due to landslides, river may get blocked forming an artificial lake which can overflow and cause floods.

(c) Houses built on steep slopes will be destroyed by debris flow, rock toppling and boulder rolling, causing loss of life and property.

6. Explain any four natural factors responsible for landslides.

- Ans. Four natural factors responsible for landslides :
 - (a) Intensity of heavy rainfall in the hilly terrain makes the rocks weather faster, especially the sedimentary rocks.
 - (b) Steep slopes provide downflow of debris easy, rock toppling and boulder rolling takes place.
 - (c) Highly weathered rocks break and slide down easily.
 - (d) Soil layer formed under gravity and seismic activity also cause landslides.

FLOODS

7. Which organisations issue flood warning in India?

- **Ans.** Flood warning are issued by :
 - (a) Central Water Commission (CWC) : Its forecasting is based on 132 forecasting stations covering almost

of the inter-state flood-prone rivers. It also covers inflow forecast for 25 reservoirs of the country.

- (b) Irrigation and Flood Control Department.
- (c) Water Resources Department.

8. Which are the flood prone areas in India?

Ans. Two regions which are most flood prone in India :

(a) The most flood prone regions are the Brahamaputra, Ganga and Meghna river basins.

(b) In the Indo-Gangetic-Brahamaputra plains in north and north-east India which carry 60% of the total river flow. It spreads over 15 states.

(c) Other flood prone areas are north-west regions of river Narmada and Tapi. Areas of east flowing river like Mahanadi, Krishna, Godavari and Kaveri.

9. Suggest any four measures to protect buildings from floods.

Ans. Four measures to protect buildings from floods :

(a) Construct the building with plinth level higher than the known high flood level. Construct buildings on stilts permitting free access to water.

(b) Avoid residing on river banks and slopes on river sides and the sides of gorge.

(c) Build houses 250 metres away from the sea coast and river banks.

(d) Lay proper drainage system in all flood prone areas so that the water can be drained off quickly to prevent accumulation.

10. Explain the main mitigation strategies to reduce the risk of floods.

Ans. Mitigation strategies for floods :

(a) Mapping of the flood plains : Identify risk zones in order to reduce risk in the area.

(b) Land use control ; It will reduce danger of life and property when water inundates the flood plains and the coastal areas. No major development should be permitted in the areas subjected to flooding. In urban areas water holding areas can be created into ponds or lakes.

(c) Construction of engineered structures ; Structures should be strong to withstand flood forces and seepage. Building should be constructed on elevated areas or on stilts.

(d) Flood Control: It can be done by flood reduction which decreases the amount of run off water by reforestation, protecting vegetation. Dams can store water. Flood Proofing reduces the risk of damage, e.g., use of sandbags to keep flood water away.

CYCLONES

11. What are the hazards associated with cyclones?

Ans. Hazards associated with cyclones are:

(a) Strong winds and heavy rainfall due to cyclones affect the coastal regions adversely. Thousands of People and cattle are drowned and killed.

(b) Villages are flooded and submerged in water. Thousands of hectares of agricultural land and horticultural land are degraded.

(c) Strong tidal waves can reach far inland. Road links are cutoff. Telephone and electricity poles are snapped-off leaving telecommunication network in shambles.

12. Discuss some mitigation strategies to protect the coastal regions from effects of a cyclone.

Or

Suggest four mitigation strategies to reduce the risk of cyclones.

Ans. Mitigation measures to protect coastal regions are :

(a) Shelter belts along the coastline will mitigate the impact of cyclonic winds and waves.

(b) Plant trees and increase vegetation cover along the coastline helps to reduce the destructive power and velocity of winds and water.

(c) Houses should be built 250 metres away from the sea coast. They should be constructed on stilts or on earth mound. Buildings should be wind and water resistant.

(d) Embankments to be made along the coastline, specially in the settlement areas. All elements holding the buildings needs to be properly anchored. Avoid large overhangs for roofs and projections should be tied down.

13. Discuss the impact of 1999 Orissa Super-cyclone.

Ans. Impact of 1999 Orissa Super-cyclone :

(a) On 29th October, 1999 cyclone with high velocity winds 260-300 km per hour hit the coast of Orissa.

(b) The storm surge created water level of the Bay of Bengal 30 feet higher than normal. The super storm travelled more than 250 km inland within 36 hours.

(c) It destroyed and submerged more than 200 lakh hectares of land, devouring trees and vegetation leaving behind a huge trail of destruction.

(d) It broke the backbone of Orissa state and killed thousands and devastated millions.

DROUGHT

14. What are the main causes of drought in our country?

Ans. The main causes of drought :

(a) Droughts are caused due to monsoon failure, scanty rainfall and excessive use of underground water.

(b) Over-exploitation of water depletes the sources faster than rainfall could recharge groundwater, especially in areas which receive scanty rainfall.

(c) Due to deforestation and global warming, climatic conditions are affected adversely. This also leads to scanty rainfall.

(d) Due to pollution of water resources.

15. List the areas which face frequent droughts in our country?

Ans. (a) Droughts affect more than 70% of cultivable land in India. Since drought conditions develop over a period of time without immediate environmental changes, it is called a 'slow disaster'.

(b) Major parts of Gujarat and Rajasthan face frequent drought because of weak monsoons as well as degraded environment.

(c) Other prominent pockets of drought prone areas are western Orissa, Rayalaseema and Telangana regions of Andhra Pradesh, Chattisgarh and Jharkhand.

16. How can droughts be prevented in India?

- Ans. We can reduce the intensity and impact of droughts through individual and collective actions :
 - (a) Community based Rainwater harvesting structures should be constructed.
 - (b) Water-shed programmes should be increased.
 - (c) Through plantation programmes, forest cover should be increased.
 - (d) Encourage growing of drought resistant crops.

17. Explain Rainwater harvesting.

- **Ans.** (a) Rainwater harvesting is a technique of increasing the recharge underground water.
 - (b) Rainwater harvesting is done by capturing and storing rain water and by constructing dugwells, percolation pits and checking dams.
 - (c) Rainwater from the roofs is collected and allowed to percolate underground.

(d) Rainwater is stored in underground reservoirs by adopting artificial recharge techniques to meet the household needs through storage in tanks.

18. Suggest mitigation strategies to reduce the impact of droughts.

Ans. Mitigation strategies to reduce impact of droughts :

(a) Drought monitoring : It is continuous observation of rainfall situation, water level in lakes, rivers and comparing with existing water needs.

(b) Water supply augmentation and conservation through rainwater harvesting in houses and farmers' fields increases the content of water availability.

(c) Expansion of irrigation facilities reduces the vulnerability of drought.

(d) Livelihood planning : It identifies those livelihoods which are least affected by the drought, e.g., raising goats, carpentry and collection of non-timber forest produce from the community forests etc.

19. What are the harmful effects of droughts?

Ans. Harmful effects of droughts :

(a) The typical effects of droughts are loss of crop, dairy products, fishery production and forest fires.

(b) Loss of biodiversity, reduce water, air and landscape quality.

(c) Groundwater depletion, food shortage, health reduction and loss of life. Increased poverty and social unrest leading to migration.

20. Discuss the indirect aggravators of droughts.

Ans. Indirect aggravators of droughts are :

(a) The effects of droughts are magnified by many reasons. The loss of green cover and deforestation affects rainfall which leads to possibility of water stress.

(b) Cutting of trees and reduction of other forms of vegetation causes soil erosion leading to low productivity of crops.

(c) Over-exploitation of groundwater depletes the water sources faster than rainfall could recharge it especially in areas of scanty rainfall.

(d) Due to loss of biodiversity, global warming increases affecting climatic conditions which usually result in scanty rainfall.

21. 'Conservation of water has been traditional practice in India.' Explain the statement with examples.

Ans. Traditional ways of water conservation in India :

(a) In western and central Himalaya regions, diversion channels 'Kuhls' were built to draw water from hill springs or streams. The length of the these channels varies from 1 to 15 km.

(b) In Meghalaya, bamboo pipes were used to tap spring water for irrigation, which provided 20-50 drops of water per minute at the site of the plant. It functioned like drip irrigation.

(c) 'Kunds' in Thar desert are covered with underground tanks with an artificially prepared catchment area to improve run-off. The structure is shaped like a bowl with a lid.

(d) In Malabar area of Kerala a 'Surangam' is like a tunnel, dug through a laterite hillock from which water seeps out and collects.

(e) The 'Ahar-Phyne' system of irrigation in Bihar. Ahars are rectangular catchment basis and the Phyne are channels built to utilise the water flowing from seasonal streams.

22. List ways to conserve water in day-to-day life.

Ans. Ways to conserve water are :

(a) Prevent misuse and wastage of water and encourage recycling of water.

(b) Create awareness among the community and involve people in all activities concerned with water conservation and its better management.

(c) Do not use treated water for gardening, washing vehicles, toilets and wash basins.

(d) Prevent pollution of water bodies. Repair the water supply pipelines immediately to prevent wastage and pollution of water.