



**ST. ANNE'S COLLEGE OF ENGINEERING AND TECHNOLOGY**  
(Accredited by NAAC, Approved by AICTE, New Delhi. Affiliated to Anna University, Chennai)

ANGUCHETYPALAYAM, PANRUTI – 607 106.

**GE8071 DISASTER MANAGEMENT (Answer key)**

**Exam: CIAII**

**Date: 12.10.2023**

**PART-A**

**PART –A (5 x 2 = 10 Marks)**

**1. Define Vulnerability.**

Vulnerability is defined as “the conditions determined by physical, social, economic and environmental factors or processes which increase the susceptibility of an individual, a community, assets or systems to the impacts of hazards”

**2. What is the community disaster?**

In disaster management community has been defined as a group of individuals and households living at the same location and having the same exposure to hazard, and share the same objectives and goals towards disaster risk reduction.

**3. Write down the effects of disaster on long term development?**

Disasters are serious disruptions to the functioning of a community that exceed its capacity to cope using its own resources. Disasters can be caused by natural, man-made and technological hazards, as well as various factors that influence the exposure and vulnerability of a community.

**4. Define the term disaster relief?**

The terms 'disaster relief' or 'humanitarian response' cover the immediate response and early recovery. The first and most important form of relief in the period immediately following a disaster is the provision of basic needs (food, water, clothes, and shelter) to those most seriously impacted.

**5. Write the objective of IPCC?**

Objective is the scientific information relevant to understanding the scientific basis of the risk of human-induced climate change, its natural, political, and economic impacts and risks, and possible response options.

**PART-B**

**11.a) Explain the impact of development projects on environment.**

1.. As a result of dam construction and holding of sediments in reservoirs, sediment feeding of downstream channel or shore beaches is prevented. Corrosions may occur. As the transfer of sediments is avoided by this way, the egg lying zone of the fishes living in the stream ecosystem is restricted, too.

2. Archaeological and historical places in company with geological and topographical places that are rare with their exceptional beauties disappear after lying under the reservoir.

3. Reproduction of migrating fishes is hindered by the floods that harm the egg beds. Or the egg gravel beds can be destructed while the excavation and coating works in the stream beds.

4. Temperature of water, salt and oxygen distribution may change vertically as a consequence of reservoir formation. This may cause the generation of new living species.

5. Normal passing ways of territorial animals are hindered since the dam works as a barrier. Meantime the upstream fish movement aiming ovulation and feeding is prevented and thus fish population decreases significantly.

6. The fishes can be damaged while passing through the floodgates, turbines and pumps of the high bodied dams.

7. There will be serious changes in the water quality as a result of drainage water returning from irrigation that was done based on the irrigation projects. In other words, over transfer of food and the increase in salt density can raise water lichens and may change water living species.

The species may change parallel to the erosion caused by the human activities or the permanent increase in the water turbidity as an outcome of the dam construction.

9. Discharge of toxic matters (pesticides, toxic metals etc.) and their condensation in food chain may affect sensitive animals immediately; all living organisms may expire when the stream becomes unable to recover itself.

10. The water regime may change as a result of destruction of nature, unexpected floods may occur and consequently vegetation and natural structures in the riverbanks can be damaged.

11. Some increase in earthquakes may occur because of filling of big dam reservoirs.

12. Rise in evaporation losses may be expected as a result of the increase in the water surface area.

13. Microclimatic and even some regional climate changes may be observed related to the changes in air moisture percentage, air temperature, air movements in big scale and the changes in the region topography caused by the stagnant, big scaled mass of water.

14. Water-soil-nutrient relations, which come into existence downstream related to the floods occuring from time to time in a long period of time, change. Depending on this fact, compulsory changes come into existence in the agricultural habits of the people living in this region and also in the flora and fauna.

15. Dams may cause increases in water sourced illnesses like typhus, typhoid fever, malaria and cholera.

16. Dams affect the social, cultural and economical structure of the region considerably. Especially forcing people, whose settlement areas and lands remain under water to migrate, affect their psychology negatively.

**11.b) Explain the Role of GIS in disaster?**

Disasters are spatial in nature as they strike at a specific location and influence a particular area. □ Location intelligence plays a critical role in disaster management. GIS coupled with remote sensing provides a basic framework that helps in all the stages of disaster management starting from preparedness, to response and recovery.

□ Through advanced wireless technologies and web-based GIS applications, disaster management by governments and other agencies is being revolutionized and is enhancing the coordination of response efforts as well as planning for disaster risk reduction.

□ GIS decision support systems for disaster have been applied in several parts of the world for effective management.

□ For assessing disaster risks, one needs an understanding of key disaster event characteristics such as location of impact (for example, earthquake epicenter, cyclone landfall), physical characteristics (magnitude in case of earthquakes, central pressure in case of cyclones), local conditions like land use and type and height of structures.

□ These characteristics require an understanding of the geography of the impacted area in order to model the hazard intensity and severity and to understand the impact on buildings, infrastructure and population, and at the same time respond to the disaster for evacuation and rehabilitation works.

□ Use of GIS and remote sensing, helps conduct all these tasks in a planned and efficient manner.

□ Earlier, when the concept of GIS did not exist, response decisions during disasters were taken mostly on the basis of prior experience and intuition rather than any live information.

□ But today, live data on many parameters such as topography, geographic features, population, infrastructure, demographics can be crucial to the response and recovery activities.

□ GIS has the power to integrate data from various sources into a common platform and make it readily accessible to various stakeholders for disaster management. It enables dissemination of critical information in a timely manner in cases of emergencies.

□ Further, the visualization of this data helps in analyzing a situation and taking quick decisions. In advanced countries of the world, GIS has been successfully utilized to address all phases of disaster management-preparedness, mitigation, response, and recovery.

□ It is very helpful to lay a foundation of GIS as all these stages are interconnected. The output of one stage serves as input to the next stage.

### **12.a) Explain the IPCC Scenario context in India?**

The Intergovernmental Panel on Climate Change (IPCC) was established in 1988 by the World Meteorological Organization (WMO) and the United Nations Environment Programme (UNEP) to assess climate change based on the latest science.

□ Through the IPCC, thousands of experts from around the world synthesize the most recent developments in climate science, adaptation, vulnerability, and

mitigation every five to seven years.

Governments request these reports through the intergovernmental process and the content is deliberately policy-relevant, but steers clear of any policy prescriptive statements. Government representatives work with experts to produce the "summary for policymakers" (SPM) that highlights the most critical developments in language accessible to the world's political leaders. Scholars, academics and students can dig into the chapters and supplementary materials for a thorough and deeper understanding of the evidence.

3.7.2 objectives  The Intergovernmental Panel on Climate Change (IPCC) is an intergovernmental body of the United Nations that is dedicated to providing the world with objective, scientific information relevant to understanding the scientific basis of the risk of human-induced climate change, its natural, political, and economic impacts and risks, and possible response options.

### **12.b) Explain in detail about the reducing Organizational Vulnerability?**

- Lack of leadership, initiative, or organizational structure.
- Lack of or limited access to political power and representation.
- Lack of or poorly resourced national and local institutions.
- Unequal participation in community affairs.
- Inadequate skills and educational background.
- Weak or non-existent social support networks.
- Limited access to outside world.

## **PART-C**

### **13.a) Make a case study on Global Warming and the possible measures to overcome the disaster**

The Earth's climate is changing. Some of this change is due to natural variations that have been taking place for millions of years, but increasingly, human activities that release heat-trapping gases into the atmosphere are warming the planet by contributing to the "greenhouse effect."

The Intergovernmental Panel on Climate Change concludes that the best estimate for global average surface air warming over the current century ranges from 1.8 °C to 4.0 °C. This rate of temperature change is without precedent in at least the last 10 000 years. Consequently, historical climate no longer provides an accurate gauge for future climate conditions. even after introducing significant measures to reduce greenhouse gas (GHG) emissions, some additional degree of climate change is unavoidable and will have significant economic, social and environmental impacts on communities.

- Climate change adaptation refers to actions that reduce the negative impact of climate change, while taking advantage of potential new opportunities. It involves adjusting policies and actions because of observed or expected changes in climate.
- Adaptation can be reactive, occurring in response to climate impacts, or anticipatory, occurring before impacts of climate change are observed. In most

circumstances, anticipatory adaptations will result in lower long-term costs and be more effective than reactive adaptations.

- There are two main policy responses to climate change : mitigation and adaptation.
- Mitigation addresses the root causes, by reducing greenhouse gas emissions, while adaptation seeks to lower the risks posed by the consequences of climatic changes.

**13.b) Explain the Indian constituent that's protects the welfare of the people:**

**(i) Panchayat Raj Institution (PRI)**

As Local Government in Disaster Management In India, after the 73rd Constitution Amendment Act, the Panchayati Raj Institutions (PRIs) have become an opportunity and instrument for people from the grassroots level to directly join in the decentralized decision making processes

**(ii) State disaster management Act**

At the State level, the SDMA, headed by the Chief Minister, will lay down policies and plans for DM in the State. It will, inter alia approve the State Plan in accordance with the guidelines laid down by the NDMA, coordinate the implementation of the State Plan, recommended provision of funds for mitigation and preparedness measures and review the developmental plans of the different Departments of the State to ensure the integration of prevention, preparedness and mitigation measures.

**(iii) The Natural Disaster Management Act**

The Disaster Management Act, 2005 seeking for an effective management authorities have been constituted at the National, State and at the District level. The National Disaster Management Authority (National Authority), which is to be chaired by the Prime Minister of India is entrusted with the responsibilities for laying down the policies on disaster management, and approve plans at the national level for disaster management.