QUESTION BANK

Name of the Department : **Electrical and Electronics Engineering**

Subject Code & Name : **GE8071 & Disaster Management**

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UNIT I INTRODUCTION TO DISASTERS

PART-A

1. Define disaster management.

Disaster management can be defined as the organization and management of resources and responsibilities for dealing with all humanitarian aspects of emergencies, in particular preparedness, response and recovery in order to lessen the impact of disasters

2. What is a disaster?

Disaster as "any occurrence that causes damage, ecological disruption, loss of human life, deterioration of health and health services, on a scale sufficient to warrant an extraordinary response from outside the affected community or area".

3. List the types of disaster.

Disasters are broadly classified into Natural disasters and Man-made Disasters

1. **Natural Disasters**: are the consequences or effects of natural hazards on human life. They represent a serious breakdown in sustainability and disruption of economic and social progress. Example: Earthquake, landslides, cyclones, floods etc.

2. **Man- made disasters**: are also known as anthropogenic disasters and they occur as a result of human intent, error or as a result of failed systems. Example: Urban fire, rail and road accidents, bomb blasts etc.

4. Define natural disaster.

A natural disaster is the effect of a natural hazard (e.g., flood, tornado, hurricane, volcanic eruption, earthquake, heat wave, or landslide). It leads to financial, environmental or human losses. The resulting loss depends on the vulnerability of the affected population to resist the hazard, also called their resilience

5. What is a manmade disaster?

A man-made disaster results from man-made hazards (threats having an element of human intent, negligence or error, or involving a failure of a man-made system). They differ from natural disasters that result from natural hazards.

6. What do you understand by hazard?

A **hazard** is a situation that poses a level of threat to life, health, property, or environment. Most hazards are dormant or potential, with only a theoretical risk of harm; however, once a hazard becomes "active", it can create an emergency situation. A hazard does not exist when it is not happening. A hazardous situation that has come to pass is called an incident. Hazard and vulnerability interact together to create risk.

7. Define Vulnerability.

Vulnerability refers to the inability to withstand the effects of a hostile environment. A **Window of Vulnerability** (WoV) is a time frame within which defensive measures are reduced, compromised or lacking .There are two types of vulnerability

- Social vulnerability
- Military vulnerability

8. Can you classify hazard.

Based on the origin, hazards are classified into geological, hydro-metrological and Anthropogenic hazards. Examples of geological hazards include earthquakes, geological fault activity, volcanic activity and emissions and tsunamis etc.Examples of hydro-metrological hazards include flood, debris and mud flows: tropical cyclones, storms and rain. Examples of Anthropogenic hazards include global warming, acid rain, technological hazard etc.

9. What is meant by Risk?

Risk can be said to be a measure of the expected losses due to a hazard event occurring in a given area over a specific time period. Risk is a function of the probability of particular hazard event and the losses it would cause.

10. Define tropical cyclones.

A tropical cyclone is composed of a system of thunderstorms that shows a cyclonic rotation around a central core or eye. A tropical cyclone is a generic term for a storm with an organized system of thunderstorms that are not based on a frontal system.

11. Define emergency.

Sudden, unexpected, or impending situation that may cause injury, loss of life, damage to the property, and/or interference with the normal activities of a person or firm and which, therefore, requires immediate attention and remedialaction.

12. What is an avalanche?

An avalanche can be composed of many different kinds of snow depending on the region, temperature and weather. It could be compiled of loosely packed light fluffy snow, which can still be very dangerous even though it may not appear threatening. It could also consist of a thick “slab” which is an area of tightly packed together snow that separates itself from the surroundings.

13. Define land use planning.

The process by which lands are evaluated and assessed to become a basis for decisions involving land disposition and utilization. This involves studies on the environmental effects of land use and its impact on the community

14.What is flood?

A form of natural disaster when there is more water than the lakes, rivers, oceans, or ground can hold. There are three types of flood 1.Fluvial Flooding 2.Pluvial Flooding 3.Coastal Flooding.

15. Define mangroves.

A mangrove is a tree, shrub, palm or ground fern, generally exceeding one half metre in height that normally grows above mean sea level in the intertidal zone of marine coastal environments and estuarine margins. A mangrove is also the tidal habitat comprising such trees and shrubs.

16. Define landslides.

A landslide or landslip is a geological phenomenon which includes a wide range of ground movement, such as rock falls, deep failure of slopes and shallow debris flows, which can occur in offshore, coastal and onshore environments. Although the action of gravity is the primary driving force for a landslide to occur, there are other contributing factors affecting the original slope stability.

17.Mention the typical effects of deforestation.

Humans have always and probably always will depended on forests to a lesser or greater degree. Trees provide food, shelter from the elements and predators not just to humans but the vast majority of life on land. Unfortunately the forests resources and appeal is its downfall.

18.Define SOP.

SOPs (Standard Operating Procedures may be prepared for any function that fire service organizations perform, including administration (hiring, equipment maintenance, building inspections, rehabilitation, etc.) and emergency response operations (fire suppression, medical services, hazardous materials response, etc.). The procedures can be organized and presented in many different ways, depending on the department's needs and preferences Immature process.

19.What is biological weapon?

Biological weapons are toxic materials produced from pathogenic organisms (usually microbes) or artificially manufactured toxic substances that are used to intentionally interfere with the biological processes of a host. These substances work to kill or incapacitate the host. Biological weapons may be used to target living organisms such as humans, animals or

vegetation. They may also be used to contaminate nonliving substances such as air, water and soil.

20.Discuss about chemical weapon.

Chemical warfare (CW) involves using the toxic properties of chemical substances as weapons. This type of warfare is distinct from nuclear warfare and Biological warfare, which together make up NBC, the military acronym for Nuclear, Biological, and Chemical (warfare or weapons). Neither of these falls under the term conventional weapons which are primarily effective due to their destructive potential. Chemical warfare does not depend upon explosive force to achieve an objective.

21. Define drought and Classify droughts.

Drought is a normal, recurrent feature of climate, although many erroneously consider it a rare and random event. It occurs in virtually all areas, whatever their normal climate may be, and the characteristics of a drought may be very different from one region to another. The different types of droughts are as follows:

1.Meteorological, 2. Hydrological, 3. Agricultural 4. Socioeconomic

22. What is meant by oilwell fires?

Oil well fires are the common term for oil or gas wells that have caught on fire and burn. Oil well fires can be the result of human actions, such as accidents or arson, or natural events, such as lightning. They can exist on a small scale, such as an oil field spill catching fire, or on a huge scale, as in geyser-like jets of flames from ignited high pressure wells.

23. What is a pandemic?

A pandemic is a disease epidemic that has spread across a large region , for instance multiple continents or worldwide. The current pandemics include HIV/AIDS and Corona virus diseases.

24. Define terrorism.

Terrorism is "the systematic use of cock especially as a means of coercion." There is no internationally agreed definition of terrorism. Most common definitions of terrorism include only those acts which are intended to create fear (terror), are perpetrated for an ideological goal (as opposed to a lone attack), and deliberately target or disregard the safety of non-combatants.

25. List the types of terrorism.

Types of Terrorism are

State Terrorism
Bioterrorism
Cyber terrorism
Eco terrorism

Nuclear terrorism
Narco terrorism

PART-B

1.Explain in detail about the causes of various types of disaster natural and manmade disaster.
2. Discuss about the types of natural disaster? Explain in detail.
3. Describe manmade (anthropogenic disaster) disaster and list out the natural disaster:
4. Examine the environmental impact of disaster.
5. Describe the Social and Economical and political impact of Disaster.
6. Illustrate the global trends in disaster management.
7. Show the impact of disaster on development project like dam,embankment
8. Disaster impacts differential groups at various levels. Justify.
9. Brief about do's and don't during various types of disasters.
10. Summarize the health and psychosocial impact of disaster.

UNIT II APPROACHES TO DISASTER RISK REDUCTION

PART-A

1. Define operations management in disaster.

Operation management is the organization and management of the resources and responsibilities for dealing with all humanitarian aspects of emergencies (preparedness, response, mitigation, and recovery). The aim is to reduce the harmful effects of all hazards, including disasters.

2. How to assess risk ?

Risk assessment is a step in a risk management procedure. Risk assessment is the determination of quantitative or qualitative value of risk related to a concrete situation and a recognized threat (also called hazard). Quantitative risk assessment requires calculations of two components of risk , the magnitude of the potential loss, and the probability that the loss will occur. In all types of engineering of complex systems sophisticated risk assessments are often made within Safety engineering and Reliability engineering when it concerns threats to life, environment or machine functioning.

3. Define NGO.

A Non-Governmental Organization (NGO) is a legally constituted organization created by natural or legal persons that operates independently from any government. The term originated from the United Nations (UN), and is normally used to refer to organizations that do not form part of the government and are not conventional for-profit business. In the cases in which NGOs are funded totally or partially by governments, the NGO maintains its non-governmental status by excluding government representatives from membership in the organization.

4. State about the disaster response.

Disaster response is a phase of the disaster management cycle. Its preceding cycles aim to reduce the need for a disaster response, or to avoid it altogether. The level of disaster response depends on a number of factors and particular situation awareness.

5. List the phases of disaster management cycle.

There are three stages of the disaster risk management which are collectively called Disaster Management Cycle. Broadly, there are six phases in Disaster Management Cycle viz. Prevention, Mitigation, Preparedness, Response, Recovery and Reconstruction.

6. Tell about mitigation disaster management cycle.

Mitigation (prevention) is the effort to reduce loss of life and property by lessening the impact of disasters. This is achieved through risk analysis, which results in information that provides a foundation for mitigation activities that reduce risk, and flood insurance that protects financial investment. Example: Building codes and zoning, vulnerability analysis and public education.

7. Analyse about disaster preparedness.

Disaster Preparedness is the process of ensuring that an organization

(1) has complied with the preventive measures,

(2) is in a state of readiness to contain the effects of a forecasted disastrous event to minimize loss of life, injury, and damage to property,

(3) can provide rescue, relief, rehabilitation, and other services in the aftermath of the disaster

(4) has the capability and resources to continue to sustain its essential functions without being overwhelmed by the demand placed on them.

8. What is community-based disaster preparedness?

Community Based Disaster Preparedness is a process of bringing people together within the same community to enable them to collectively address a common disaster risk and to collectively pursue common disaster preparedness. Community Based Disaster Preparedness is a process that mobilizes a group of people in a systematic way towards achieving a safe and resilient community/group.

9. Highlight the structural measures of cyclone.

Engineering measures such as cyclone shelter is one of the key cyclone mitigation measure adapted. For effective employment and management of cyclone shelters, multipurpose versions have been built in carefully selected locations, identifying uses for both normal and disaster periods. Cyclone shelters demonstrate an excellent dual-purpose use during non disaster periods and cyclones.

10. What are the structural measures taken for flood risk reduction?

Structural measures aim at protecting an area up to certain level of flooding. It can be divided into five categories:

Storage reservoir or basins to restrict overflow.

Retarding basins to lower the flow of flooding
Levees and floodwalls to confine floodwaters
Improvement of channel capacity
Some structural measures such as Flood Embankment, Channel Improvement, River Training, Coastal Embankment etc. to combat the flood sufferings.

11. State the non-structural measures taken for flood risk reduction.

Non-Structural Measure to reduce loss or damage by administrative measures. It does not control or affect the process of inundation. Some of the non structural measures are

- Flood Plain Zoning & Management;
- Policies for infrastructure Planning and Development in the flood plains;
- Flood Proofing&Flood insurance
- Disaster Preparedness & Response Planning and
- Flood Forecasting and Warning.

Flood fighting, & Evacuation and shelter management

12.Highlight the roles and responsibility of NDMA?

National disaster Management Authority **(NDMA)** is responsible for framing policies, laying down guidelines and best-practices for coordinating with the State Disaster Management Authorities (SDMAs) to ensure a holistic and distributed approach to disaster management. It is headed by the Prime Minister of India and can have up to nine other members.

13. Outline the function of SDMA.

The function of SDMA is Framing of Disaster Management Policy and the preparation of the State Disaster Management Plan, reviewing the preparedness, prevention, mitigation and capacity building measures in the State..

14. Write about early warning system in disaster.

An Early Warning System can be defined as a set of capacities needed to. generate and disseminate timely and meaningful warning information of the. possible extreme events or disasters (e.g. floods, drought, fire, earthquake and. tsunamis) that threatens people's lives.

15.List the roles and responsibilities of community group and voluntary agencies.

Local community groups and voluntary agencies including NGOs should actively assist in prevention and mitigation activities under the overall direction and supervision of the District Disaster Management Authority (DDMA). They should actively participate in all training activities as may be organized and should familiarize themselves with their role in disaster management.

16. Define risk identification.

The first step in risk management is identifying the risks that we will see in our project. These are the things that threaten to stop us from delivering what we have promised on the schedule we promised for the budget we promised. If we were completely certain about everything in the project and how it was going to turn out, we would not have to worry about risk management.

17. What are the steps involved in disaster management cycle?

The steps involved in disaster management cycle are

Mitigation -Minimizing the effects of disaster.
Examples: building codes and zoning; vulnerability analyses; public education.
Preparedness –Planninghow to respond.
Examples: preparedness plans; emergency exercises/training; warning systems.
Response - Efforts to minimize the hazards created by a disaster.
Examples: search and rescue; emergency relief.
Recovery -Returning the community to normal.
Examples: temporary housing; grants; medical care.

18. Mention about risk sharing.

Risk managementmethod in which the cost of the consequences of a risk is distributed among several participants in an enterprise, such as in syndication.

19. What is the goal of disaster management?

Disaster management aims to reduce, or avoid, the potential losses from hazards, assure prompt and appropriate assistance to victims of disaster, and achieve rapid and effective recovery.

20. What are State Disaster Response Fund ?

The State Disaster Response Fund (SDRF), constituted under Section 48 (1) (a) of the Disaster Management Act, 2005, is the primary fund available with State Governments for responses to notified disasters.SDRF shall be used only for meeting the expenditure for providing immediate relief to the victims.

21. What is the role of government in disaster management?

The role of government in disaster management is to act as a focal point for command and control between agencies, set standards, delegate authority to states and municipalities, and to bring whatever resources are necessary during and after an incident to bear.

22. Brief about District Disaster Management Authority (DDMA).

DDMA will act as the planning, coordinating and implementing body for disaster management at the district level. It will prepare the District Plan for disaster management in accordance with instructions by NDMA and SDMA. The DDMA will also ensure that the guidelines for prevention, mitigation, preparedness and response measures laid down by the NDMA and the SDMA are followed by all the Departments of the State Government at the District level and the local authorities in the District.

23. Outline the role of community in disaster management in India.

The framework for community based disaster management (CBDM) in India is provided by the National Disaster Management Agency (NDMA). The NDMA recognises the community as the first responder in the event of a disaster, which means that it has invested significantly in ensuring that communities know what, where, when, and how they should be planning

for, responding to, and recovering from disasters. The NDMA decided to produce the National Policy Guidelines on Community-based Disaster Management to better inform communities and those working with them in this regard.

E.g.: Public Distribution Centers (fair price shops) should set up special mechanisms to ensure that food supplies are not disrupted and discontinued. Cultural groups should engage in awareness building for disaster preparedness.

24. Distinguish between mitigation and prevention.

Mitigation means to reduce the severity of the human and material damage caused by the disaster. Prevention is to ensure that human action or natural phenomena do not result in disaster or emergency.

25. What is the principle objective of mitigation?

Principal Objectives of Mitigation are

1. To save lives
2. To reduce economic disruption
3. To decrease vulnerability/increase capacity
4. To decrease chance/level of conflict

PART-B

1. Discuss in detail about disaster Management cycle
2. Explain structural and non-structural mitigation measures for various types of disasters.
3. Illustrate about Drought Management Framework in India
4. Explain about community based disaster risk reduction.
5. Explain the roles & responsibilities of Community in disaster Management.
6. State the roles & responsibilities of State, Center for disaster management in detail.
7. Highlight the roles and responsibilities of Panchayati Raj Institutions/Urban Local Bodies (PRIs/ULBs) in disaster management.
8. Explain in detail about State Disaster Management Authority(SDMA)
9. Summarizeabout the importance of early warning system.
10. Analyze the role of advisory Agencies in the disaster Management.

UNIT III INTER-RELATIONSHIP BETWEEN DISASTERS AND DEVELOPMENT

PART-A

1. Show the factors that affects vulnerability.

The main factors affecting vulnerability are

Wealth: The poor are less able to afford housing and other infrastructure that can withstand extreme events.

Education: Even without literacy, it is possible to educate a population about hazards in order to help it reduce its vulnerability.

Governance: The nature of both formal governments and informal governance in a population is another important factor. Governments can advance policies that reduce vulnerability

Technology: Technology can improve our ability to forecast extreme events, withstand the impacts of the events, and recover afterwards.

Age: Children and the elderly have fewer financial resources and are frequently dependent on others for survival

The major levels of Testing are as follows:

Unit testing (testing individual component), integration testing(testing integrated component), system testing(testing the entire system), and acceptance testing (testing the final system)

2. Mention the impacts of disaster on economy.

The term defines that any calamity which is beyond the capability of local community. It means that sources of income are meager and new opportunities to invest and flourish the business are remote. Rather focus is more on recovery than on prosperity. The economy indicators have to be change and new indicators has to be placed. Though there is a vast requirement of everything but priorities would make it difficult to divert resources on economic and business activities as foremost requirement is to provide immediate relief assistance to the victims.

3. What are the impacts of disaster on ecology and environment?

The immediate affect a disaster makes is the change of ecology and environment of the affected area. Some new geological features like lakes can be formed which disturbs the ecological and environmental balance of the area. Destruction of roads, buildings and other infrastructure has its impact on the ecology and environment beside economic impacts.

4. Identify the environmental impacts of dams?

The environmental impacts of dams are terrestrial ecosystem and biodiversity, green house emissions, downstream aquatic ecosystem and biodiversity, impacts of changes in flow regimes, impacts of trapping sediments and nutrients behind a dam and blocking migration of aquatic organisms.

5. Mention the causes of dam failure.

The causes of dam failure are earthquakes, extreme inflow, poor maintenance – especially of outlet pipes, human or computer design error, internal erosion, sliding of mountain into reservoir, sub-stranded construction material, spill way design error and poor surveying.

6. What is meant by land use, land cover and zoning?

Land use is characterized by the arrangements, activities and inputs people undertake in a certain land cover type to produce, change or maintain it.

Land cover is the physical material at the surface of the earth. Land cover include grass, asphalt, trees, bare ground, water etc.

Zoning is the term used for designating permitted uses of certain parcels of land by local governments. Generally, in urban areas, zoning will be divided five major categories:

residential, mixed residential-commercial, commercial, industrial, and special (e.g., power plants, sports complexes, airports, shopping malls etc.).

7. What is the need of land use assessment?

Land use information can be used to develop solutions for natural resource management issues such as salinity and water quality. More recent significant effects of land use include urban sprawl, soil erosion, soil degradation, Stalinization and desertification.

8. State the effects of climatic change.

The effect of climate change leads : Change in rain fall pattern and flooded area, Rise in sea level, Extreme heat, Soil erosion, Forest fire, Frequent drought and water shortage.

9. What is adaptation in climate change?

Adaptation refers to adjustments in ecological, social or economic systems in response to actual or expected climatic stimuli and their effects or impacts. It refers to changes in processes, practices, and structures to moderate potential damages or to benefit from opportunities associated with climate change.

10. List the components for adaptation in climate change?

The components are Observation of climatic and non-climatic variables, Assessment of climate impacts & vulnerability, Planning & implementation, Monitoring & Evolution, Knowledge sharing & learning and Stockholders engagement.

11. What is IPCC?

The Intergovernmental Panel on Climate Change (IPCC) is a United Nations body, founded in 1988, which evaluates climate change science. The *IPCC* provides regular assessments of the scientific basis of climate change, its impacts and future risks, and options for adaptation and mitigation.

12. What is UNFCCC?

The United Nations Framework Convention on Climate Change (UNFCCC) defines climate change as "a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods".

13. What are IPCC climatic impacts for India?

The climatic impacts for India are changes in weather patterns, cyclonic disturbances, sea-level rise, changes in agricultural yields, changes in fresh water supply, impacts on forests and natural ecosystems and impacts on human health.

14. What is the need of indigenous knowledge in disaster management?

The social and natural scientists are convinced that in many matters there is a need of integrating the indigenous knowledge into the modern scientific approaches, to anticipate natural hazards more effectively. Therefore, in the fast growing risks of natural disasters worldwide, the mechanism of management is studied by many experts, and has come to the conclusion that indigenous knowledge is one of the key parameters for developing early warning systems (EWS), for disaster risk management.

15. Define displaced person.

The term refers to situations where people are forced to leave their homes or places of habitual residence as a result of a disaster or in order to avoid the impact of an immediate and foreseeable natural hazard.

16. Mention the factors contributing to Vulnerability.

The factors contributing to vulnerability are poverty, livelihoods,culturalbelief,gender,weaker social group, equity. Example:The principal livelihoods of communities living in rural flood plains are mainly farming and fishing. However, recurring floods threaten their stability of their livelihoods owing to the loss of farm products or limited access to the markets for their products in the absence of adequate transport infrastructure. The landless poor, working as hired labourers,particularly during long flood seasons, have trouble finding jobs to meet their basic needs.

17. What is the IPCC?

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.

18. What are the roles of IPCC?

The IPCC is an intergovernmental body sponsored by UNEP and WMO. The main decision-making body is the "Panel" which meets at regular intervals in plenary sessions at the level of government representatives of all 194 IPCC member countries. Its role is to assess on a comprehensive, objective, open and transparent basis the scientific, technical and socio-economic information relevant to understanding the scientific basis of risk of human-induced climate change, its potential impacts and options for adaptation and mitigation.

19. Mention some measures for mitigating and adapting to climatic change.

Some measures for mitigating and adapting to climatic change are

- Improving energy efficiency and opting for renewable energy over fossil fuels.
- Promoting public transport and sustainable mobility by increasing the numbers of journeys in towns by bicycle, reducing the number of flights and taking more trips by train or in shared cars.
- Promoting ecological industry, agriculture, fishing and livestock farming, food sustainability, responsible consumption and the 3Rs rule (reduce, reuse, recycle).
- By taxing the use of fossil fuels and CO2 emissions markets.

20. What is climate change adaptation?

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.

21. Specify the role of technology in disaster management?

Land sat, SPOT Satellite, Satellite Radar System, Advanced Very High Resolution Radio & GIS can also be used in carrying out search and rescue operations in a more effective manner by identifying areas that are disasters prone and zoning them accordingly to risk magnitudes.

22. What is differential impact?

The term, 'differential impacts' refers to the discriminatory impacts experienced by different individuals, groups or communities when faced with an event with damaging consequences. Example: Among the affluent and the poor, the poor are continuously exposed to stressful living conditions and are better adapted to face the hardships encountered in disasters while the affluent are adapted to a luxurious lifestyle and will not be able to adjust to the harsh environment in the aftermath of a disastrous event.

23. Mention 3 examples of climatic change adaption

Some examples of climate change adaptation are

- Predicting climate change related trends based on assessment of current risk, vulnerability and climate variability
- Integrate long-term sustainable development and poverty reduction strategies
- Strengthening existing capacities and Developing robust mobilization mechanisms and ensure financial and technical support to local disaster management officials
- Arrange improved and tested early warning systems, contingency plans along with integrated response to ensure effective community based adaptation and risk reduction.

24. What is Indigenous knowledge?

Indigenous knowledge is a unique way of gaining information about important facets of world's cultural diversity and is an important source of locally-appropriate sustainable development. Indigenous knowledge has proved to be of significance in reducing risk from disasters caused by natural phenomena like earthquake, cyclone, droughts, landslide, tsunami etc. Indigenous knowledge is culture specific and represents people's lifestyle.

25. List few examples of the use of indigenous knowledge to manage or mitigate the effects of disasters

- Few examples of the use of indigenous knowledge to manage or mitigate the effects of disasters are
- Indigenous construction practices for earthquake safe housing in Kashmir known as "Tab" and "DhajjiDewari" have earthquake resistant qualities
- Bamboo plantation along canal bunds by villagers in Assam has protected embankments, bridges and roads from damage during heavy rains
- The traditional and indigenous knowledge of the people of Sri Lanka helped the people build a village tank cascade system for drought mitigation and rural-well being in the drought-prone Purana villages of Sri Lanka.

PART-B

1. Critically examine the various factors affecting vulnerability in disaster risk management.
2. How disaster affect the developmental activities in a society.
3. Explain in detail climate change adaptation in India.
4. Outline the importance of indigenous knowledge. How is it helpful in disaster management.
5. Write in detail about the IPCC report scenario in the context of India.
6. illustrate the differential impacts in detail.
7. Discuss the effects of global warming in climatic change.
8. Write note on appropriate knowledge and local resources in disaster management.
9. Explain climatic change adaptive capacity in various section sectors.
10. Explain about United Nations Framework Convention on Climate Change (UNFCC)

UNIT IV DISASTER RISK MANAGEMENT IN INDIA

PART-A

1. What is a multi-hazard?

Multi-hazard is to describe the independent analysis of multiple different hazards (e.g., landslides, earthquakes, volcanic eruptions, flooding) relevant to a given area.

2. Write a note on India's natural vulnerability to disaster.

India's natural vulnerability to disaster are as follows

- 57% land is vulnerable to earthquakes. Of these, 12% is vulnerable to severe earthquakes.
- 68% land is vulnerable to drought.
- 12% land is vulnerable to floods.
- 8% land is vulnerable to cyclones.
- Apart from natural disasters, some cities in India are also vulnerable to chemical and industrial disasters and man-made disasters.

3. Define disaster relief.

Disaster Relief refers to the provision of essential, appropriate and timely humanitarian assistance to those affected by a disaster, based on an initial rapid assessment of needs and designed to contribute effectively and speedily to their early recovery. It consists of the delivery of a specific quantity and quality of goods to a quantified group of beneficiaries, according to selection criteria that identify actual needs and the groups that are least able to provide them for themselves.

4. Highlight the components of disaster relief.

The main components of disaster relief are water, food, sanitation, shelter, heath and waste management. A disaster can easily disrupt the food supply at any time. Hence plans must be made to have at least three days of food readily available.Water is essential for all living organisms. During disaster relief operations ,arrangements for at least three and a half liters (3.5l) of potable water per person per day should be made. Sanitation is an essential component during relief since disasters pose significant health threats in the form of contaminated drinking water and spread of infectious diseases. In the event of a disaster, the agency responding to the disaster should make arrangements to provide temporary shelter to the affected community.

5. Mention emergency risk management for health.

Emergency risk management for health is multi sectoral and refers to the systematic analysis and management of health risks, posed by emergencies and disasters, through a combination of (i) hazard and vulnerability reduction to prevent and mitigate risks (ii) preparedness (iii) response (iv) recovery measures.

6. List the features of an Emergency situation in disaster management?

The features of an Emergency situation in disaster management are

- Sense of urgency in decision-making under constraints
- Limited information or overload of information
- Multiplicity of stake-holders and responders
- Complexities of co-ordination
- The capacity of the local community and government to respond effectively often overwhelmed.

7. What are the institutional disaster arrangements for enhanced quality of life?

The institutional disaster arrangements for enhanced quality of life are:
Revitalizing local economy • Improved public safety ,Equity and civic engagement • Disaster resilience • Improved governance • Greater accountability and ownership • Enhanced spaces for ideation and civic discourse • Housing • Quality Education • Mobility • Health Care • Employment and Livelihood Protection.

8. What is NDRF?

The National Disaster Response Force (NDRF) is an Indian specialised force constituted for the purpose of specialist response to a threatening disaster situation or disaster" under the Disaster Management Act, 2005.The head of the NDRF is designated as Director General. The Director Generals of NDRF are IPS officers on deputation from Indian police organisations.

9. What do you understand by disaster resilience?

Disaster resilience is the ability of individuals, communities, organizations and states to adapt to and recover from hazards, shocks or stresses without compromising long-term prospects for development.

10. Outline the disaster risk reduction legislation?

Laws and regulations serve as a foundation for building community resilience. They are essential to reducing existing risks posed by natural hazards, preventing new risks from arising and making people safer.

11. Identify the role of GIS.

GIS is a tool that allows users to create interactive queries (user created searches), analyze the spatial information, edit data, maps, and present the results of all these operations. GIS provides environment for effective and efficient storage and manipulation of remotely sensed or other spatial and non-spatial data types for both scientific management and policy oriented information. The specific applications in Risk Assessment are Hazard mapping to show earthquake, floods, landslide or fire. These maps are used for warning system

12. Specify the objectives of disaster damage assessment.

The basic objectives of damage assessment could be summarized as follows:

- To make a rapid assessment of areas affected to know the extent of impact for purpose of immediate rescue and relief operations;
- To prepare estimates for the amount of relief to be provided and the mode of relief, be it food, clothing, medicines, shelter or other essential commodities;
- To make a detailed assessment regarding requirements for long-term relief and rehabilitation planning;
- To identify focus areas for the purpose of 'retrofitting' actions in similar future situations.

13. Name the man-made hazard vulnerability of India.

- Urban Fires (due to human errors and technical faults, mostly short-circuit)
- Terrorist Related Disasters.
- Civil Disorder
- Rail, Road and Air accidents etc.
- Boat Capsizing/Ship wreck
- Industrial Accidents& Building Collapses Epidemics Stampedes.

14. Write a note India's disaster on flood.

India is highly vulnerable to floods and out of the total geographical area of 329 mha, more than 40 mha is flood prone while the average area affected by floods annually is about 8 million hectares. Floods are recurrent phenomenon, which cause huge loss of lives and damage to livelihood system, property, infrastructure and public utilities.

15. List the three main interlinked components of disaster risk.

Disaster risk is a function of three interlinked components: hazards, Exposure and vulnerability.

(i)Hazard refers to the likelihood and intensity of a potentially destructive natural phenomenon, such as ground shaking induced by an earthquake or extreme winds associated with a cyclone.

(ii)Exposure refers to the location, attributes, and value of people and assets (such as buildings, agricultural land, and infrastructure) that are exposed to the hazard.
(iii)Vulnerability is the potential extent to which physical, social, economic, and environmental assets may become damaged or disrupted when exposed to a hazard event.

16. Write about Disaster Management Act?

The Disaster Management act came into effect on 23rd December 2005 and it applies to the whole of India. For the purpose of disaster management, the centre shall set-up a body called the National Disaster Management Authority (NDMA) with the Prime Minister of India holding the position of chairperson, exofficio.The Chairperson shall nominate a maximum of nine members to the NDMA and designate one of the nine members as the vice-chairperson. The NDMA is responsible for laying down policies, plans and guidelines for disaster management to ensure timely and effective response to a disaster. The NDMA can recommend provision of funds for disaster mitigation.

17. What is Crisis Management Group (CMG)?

The CMG coordinates activities of central ministries and state governments in relation disaster preparedness and relief In the event of a natural disaster, the CMG meets frequently to review relief operations and extend all possible to overcome the situation effectively.All the secretaries of concerned ministries are the members of CMG and they implement the decisions of the cabinet committees .

18. Mention some programs related to disaster management.

The National Disaster Management Authority (NDMA) hosts several programs for mitigation and responsiveness for specific situations. A few of the programs include:

- National Cyclone Risk Management Project
- School Safety Project
- Decision Support System
- Scheme for training of community volunteers for disaster response in thirty most flood prone districts in India
- Sustainable reduction in disaster risk in ten multi-hazard prone districts in five states of India
- Capacity building on disaster management for IAS and central service officers at Lal Bahadur Shastri National Academy of Administration (LBSNAA), Mussoorie

19. Define Sendai Framework.

The Sendai Framework for Disaster Risk Reduction (2015–2030) is an international document which was adopted by UN member states between 14th and 18th of March 2015 at the World Conference on Disaster Risk Reduction held in Sendai, Japan and endorsed by the UN General Assembly in June 2015.

20. Write note on Legislation for disaster management.

Laws and regulations serve as a foundation for building community resilience. The Hyogo Framework for Action (HFA) highlighted the importance of good legislation for effective disaster management. The Sendai framework adopted in 2015 insists for a renewed focus on reviewing and strengthening legal frameworks.

21. Define Disaster response

Disaster response refers to actions taken during and immediately after a disaster to ensure that its effects are minimized, and that people affected are given immediate relief and support. These include providing food, water, shelter, and medical aid, removing people from danger, among other outreach efforts.

22. What is DDMA?

DDMA means District Disaster Management Authority. The vision of the District Disaster Management Authority (DDMA) is to create a dedicated body for mitigation of disasters at the district level. The DDMA should ensure that areas in the district vulnerable to disasters are identified and mitigation measures are taken up by the concerned authorities.

23. Write note on Disaster Management Act 2005.

The Disaster Management act came into effect on 23rd December 2005 and it applies to the whole of India. According to Disaster Management Act 2005 ,for the purpose of disaster management, the centre shall set-up a body called the National Disaster Management Authority (NDMA) with the Prime Minister of India holding the position of chairperson, exofficio.The Chairperson shall nominate a maximum of nine members to the NDMA and designate one of the nine members as the vice-chairperson. The members shall meet as necessary as deemed by the chairperson of the NDMA.The NDMA is responsible for laying down policies, plans and guidelines for disaster management to ensure timely and effective response to a disaster.

24.What is NIDM?

The NIDM (National Institute for Disaster Management) has been mandated by the Govt. of India to be a deemed University and institute of excellence on higher learning and capacity building. Under the Disaster Management Act 2005, NIDM has been assigned nodal responsibilities for human resource development, capacity building, training, research, documentation and policy advocacy in the field of disaster management.

25. List some programs related to disaster management.

The National Disaster Management Authority (NDMA) hosts several programs for mitigation and responsiveness for specific situations. A few of the programs include:

- National Cyclone Risk Management Project
- School Safety Project
- Decision Support System
- Scheme for training of community volunteers for disaster response in thirty most flood prone districts in India
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PART-B

1.How will you assess the loss and damage to human life in disasters?

2. Enumerate the possible risk reduction measures in flood.

3.Write a note on disaster management act 2005.

4.Examine the purpose of damage assessment? What factors influence the assessment methods and the tools used to assess damage.
5.Illustrate the institution awareness and safety programmes.
6. Explain about rapid Damage assessment and detailed damage Assessment?
7. Discuss about the role of GIS in disaster management.
8. Explain disaster risk reduction in detail.
9. Analyze the role of different types of media in disaster management
10. State the application of science and Technology in Disaster management.

UNIT V DISASTER MANAGEMENT: APPLICATIONS AND CASE STUDIES AND FIELD WORKS

PART-A

1.State the contribution of ISRO in disaster management in India.

ISRO disseminates relevant information in interactive geo-spatial domain through various geoportals like Bhuvan, National Database for Emergency Management and MOSDAC for the administrators to better understand the impact and for improved decision support during disasters.ISRO provides the satellite based near real time information support to Central Ministries / Departments and State Ministries / Departments, prior during and after major natural disasters. In addition, ISRO also provides capacity building in use of Space technology inputs in Disaster Management Support.

2. What is a fluvial flood?

Fluvial (River Flood) Fluvial, or riverine flooding, occurs when excessive rainfall over an extended period of time causes a river to exceed its capacity. It can also be caused by heavy snow melt and ice jams.

3. Describe disaster mitigation.

Disaster Mitigation activities actually eliminate or reduce the probability of disaster occurrence, or reduce the effects of unavoidable disasters. Mitigation measures include building codes; vulnerability analyses updates; zoning and land use management; building use regulations and safety codes; preventive health care; and public education.
Disaster Mitigation will depend on the incorporation of appropriate measures in national and regional development planning. Its effectiveness will also depend on the availability of information on hazards, emergency risks, and the countermeasures to be taken.

4. Describe disaster preparedness.

Disaster preparedness can be described as logistical readiness to deal with disasters and can be enhanced by having response mechanisms and procedures, rehearsals, developing long-term and short-term strategies, public education and building early warning systems. Preparedness can also take the form of ensuring that strategic reserves of food, equipment, water, medicines and other essentials are maintained in cases of national or local catastrophes. During the preparedness phase, governments, organizations, and individuals

develop plans to save lives, minimize disaster damage, and enhance disaster response operations.

5. List out the role of media in disaster.

The media assists in the management of disasters by educating the public about disasters;

- warning of hazards
- gathering and transmitting the information about the affected areas
- alerting government officials,relieforganizations and the public to specific needs
- facilitating discussions about the disaster preparedness and response for continuous improvement
-

6. What are the effects of forest fire?

The effects of forest fires are

- Fauna and flora upset by forest fires

Forest fires increase carbon dioxide levels in the atmosphere, contributing to the greenhouse effect and climate change. In addition, ashes destroy much of the nutrients and erode the soil, causing flooding and landslides.

7. How human activities increase the chance of coastal flooding ?

Human factors increasing flood risk:

Urbanisation - because towns and cities have more impermeable surfaces.

Deforestation-removing trees reduces the amount of water intercepted and increases.

8. Mention some short term gain generated by disaster.

Disasters may generate short-term gains from:

- Changes in future production, employment, and income and/or changes in these flows outside the damaged area . Current production outside the immediate area of impact or future production within the affected region may compensate for initial disaster-induced losses.
- Income gains outside the impact area to owners of commodities inflated in price by disaster-induced shortages. Both agricultural commodities lost in a disaster and construction materials demanded during reconstruction are particularly likely to generate these windfall profits outside the region.
- Positive economic stimuli of jobs and production generated from cleaning up and rebuilding and the multiplier effect of those increases.

9. Specify some flood mitigation plan.

Flood mitigation plan involves:

- Floodplain zoning by the respective state governments. Even after the recommendations of the RashtriyaBarhAyog (RBA) in 1976, only three such states have passed these acts – Rajasthan, Manipur and Uttarakhand and even in these states, the implementation is lax.
- Planting of the tree and mangrove belts along river banks and coastlines.
- Shared flood warning mechanisms with both upstream and downstream neighbours across international boundaries.

- Recharge and rejuvenation of wetlands and prevention of any encroachment upon their areas.

10. What is Seismograph and Seismogram?

A seismograph is the device that scientists use to measure earthquakes. The goal of a seismograph is to accurately record the motion of the ground during a quake. A seismogram is a graph output by a seismograph. It is a record of the ground motion at a measuring station as a function of time.

11. What is an Early warning systems?

An early warning system (EWS) is technology and associated policies and procedures designed to predict and mitigate the harm of natural and human-initiated disasters and other undesirable events. Early warning systems for natural hazards include those designed for floods, earthquakes, avalanches, tsunamis, tornadoes, landslides and drought.

12. What are the five earthquake hazards?

The five earthquake hazards are

- Ground Shaking. If an earthquake generates a large enough shaking intensity, structures like buildings, bridges and dams can be severley damaged, and cliffs and sloping ground destabilised.
- Tsunami.
- Landslides and Rockfalls.
- Subsidence and Lateral Spreading.
- Liquefaction.

13. Mention indirect losses in disaster.

Disasters can produce indirect losses and the losses include

- Induced losses in sales, wages, and/or profits due to loss of function.
- Input/output losses to firms forward-linked or backward-linked in production to businesses closed as a result of direct physical damage or infrastructure failure. Slowdowns or shutdowns are induced by reductions in demands for inputs and supplies of outputs from damaged firms.
- Spending reductions from the income losses triggered by firm closures or cutbacks—so-called multiplier, or ripple, effects. Employees of the firms experiencing reduced production and sales suffer income losses and subsequently curtail their own expenditures, initiating a new round of firm cutbacks.

14. What is Pluvial flooding?

Pluvial flooding is when rainfall or snowmelt is not absorbed into the ground forcing the water to flow overland. The area will remain flooded until water has drained away through stormwater systems or waterways.

15. What is the role of WHOin global health security ?

World Health Organization WHO contributes to global health security by:

- strengthening national surveillance programmes, particularly in the field of epidemiology and laboratory techniques;

- disseminating verified information on outbreaks of diseases, and also by providing technical support for response;
- Collecting, analyzing and disseminating information on diseases likely to cause epidemics of global importance.

16. Idenfiy the consequence of drought.

The consequence of drought are

- Crop failure.
- Shortage of water which leads to large scale death of cattle and other animals.
- Migration of human and livestock.
- Scarcity of water compels people to consume contaminated water resulting in the speed of many water borne diseases.

17. List some flood prone areas in India.

The most flood prone areas are the Brahmaputra, Ganga and Indus basins. As far as the states are concerned, Uttar Pradesh, Bihar, West Bengal and Orissa are the most flood affected states followed by Haryana, Punjab and Andhra Pradesh. Nowadays Rajasthan and Gujarat also feel the fury of floods. Karnataka and Maharashtra are no longer immune to floods.

18. How is a Tsunami formed?

Seismicity generated tsunamis are the result of abrupt deformation of sea floor resulting vertical displacement of the overlying water. When earthquakes occur beneath the sea level, the water above the reformed area is displaced from its equilibrium position. The release of energy produces tsunami waves which have small amplitude but a very long wavelength. It may be caused by a non-seismic event such as a landslide or impact of a meteor.

19. Mention the two types of biological disaster.

The two types of biological disasters are

1.Epidemic-level biological disasters affect large members of people within a given community or area. Example: cholera

2.Pandemic- level biological disasters affect a much larger region, sometimes spanning entire continents or the globe. Example: Swine flu , Covid 19

20. What is biological warfare?

Biological warfare is the use of biological toxins or infectious agents such as bacteria, viruses, and fungi with intent to kill or incapacitate humans, animals or plants as an act of war. NBC is the military acronym for nuclear, biological, and chemical warfare using weapons of mass destruction. This can also be termed as bioterrorism.

21. Brief about Landslide Mitigation.

Landslide mitigation plans are as follows

- Restriction on construction and other developmental activities such as roads and dams.
- Limiting agriculture to valleys and areas with moderate slopes.
- Control on the development of large settlements in the high vulnerability zones ‘

- Promoting large scale afforestation programs.
- Hazard mapping should be done to locate areas commonly prone to landslides
- Terrace farming should be encouraged in the north eastern hill states replacing Jhumming or shifting cultivation measures to deal with landslides.
- Retaining walls can be built of mountain slopes to stop land from slipping.

***22.* Write note on Drought Crisis Management Plan, 2015**

Based on Drought Crisis Management Plan, 2015 ,the NDMA manual sets out four important measures that a State government should take at the time of drought, with the Union government's help.

- MGNREGA to provide immediate employment to drought-affected people.
- The public distribution mechanism should be strengthened to provide food and fodder.
- Initiate actions to recharge the groundwater table by building check dams and providing pipeline water and other irrigation facilities.
- The government should either waive off or defer farmer loans and arrange for crop loss compensation.

23. Write note on earthquake mitigation.

Earthquake mitigation plan are as follows.

a.National earthquake Risk Mitigation Project: The project aims at strengthening the structural and non-structural earthquake mitigation efforts in reducing the vulnerability in high risk districts prone to earthquakes.

b.National Building Code:The salient features of the NBC 2005 include meeting the challenges posed by natural calamities and reflecting the state-of-the-art and contemporary applicable international practices.

c.Seismic retrofitting: It is the modification of existing structures to make them more resistant to seismic activity, groundmotion, or soil failure due to earthquakes.

24. What are the Challenges for Earthquake Mitigation in India ?

The challenges for earthquake mitigation in India are

- Inadequate enforcement of earthquake-resistant building codes and town planning by laws. Absence of earthquake-resistant features in constructions in urban and rural areas.
- Lack of formal training among professionals in earthquake-resistant construction practices.
- Lack of adequate preparedness and poor response capacity of various stakeholder Groups

25. What is Level 1 and Level 2 Disaster?

Level-L1 : The level of disaster that can be managed within the capabilities and resources at the District level, However the state authorities will remain in readiness to provide assistance if needed.

Level-L2: This signifies the disaster situations that require assistance and active mobilization of resources at the state level and deployment of state levelagencies for disaster

management. The central agencies must remain vigilant for immediate deployment if required by the state.

PART-B

1. What was the flood that affected Kerala recently? Critically evaluate the risk reduction strategies followed during the disaster.
2. How to mitigate the risk of floods in future?
3.Explain Rehabilitation strategy after a disaster.
4. Explain the different types of man-made disasters with special reference to Bhopal gas leaked tragedy.
5. Explain the causes and measures to prevent forest fires.
6. Explain in details about the Causes, impact and NDMA Guidelines on Landslide Hazard Management.
7. Discuss the factors responsible for occurrence of tsunami and its effects on life and economy. In the light of guidelines of NDMA (2010) describe the mechanisms for preparedness to reduce the risk during such events.
8. The frequency of urban floods due to high intensity rainfall is increasing over the years.Discussing the reasons for urban floods, highlight the mechanisms for preparedness to reduce the risk during such events.
9. What are the causes of tropical cyclones and local storms and also explain the steps to be adopted to mitigate the same.
10. Write about NDMA Guidelines on Earthquake Management.