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***Revised Syllabus of Courses of B.Com. (Accounting and Finance)
Programme at Semester III
with Effect from the Academic Year 2022-2023***

2B. Skill Enhancement Courses (SEC)

Foundation Course- Contemporary Issues- III

Modules at a Glance

Sr. No.	Modules	No. of Lectures
1	Human Rights Provisions, Violations and Redressal	12
2	Dealing With Environmental Concerns	11
3	Science and Technology I	11
4	Soft Skills for Effective Interpersonal Communication	11
Total		45

Sr. No.	Modules / Units
1	Human Rights Violations and Redressal
	<p>A. Scheduled Castes- Constitutional and legal rights, Forms of violations, Redressal mechanisms. (2 Lectures)</p> <p>B. Scheduled tribes- Constitutional and legal rights, Forms of violations, Redressal mechanisms. (2 Lectures)</p> <p>C. Women- Constitutional and legal rights, Forms of violations, Redressal mechanisms. (2 Lectures)</p> <p>D. Children- Constitutional and legal rights, Forms of violations, Redressal mechanisms. (2 Lectures)</p> <p>E. People with Disabilities, Minorities, and the Elderly population- Constitutional and legal rights, Forms of violations, Redressal mechanisms. (4 Lectures)</p>
2	Dealing With Environmental Concerns
	<p>A. Concept of Disaster and general effects of Disasters on human life- physical, psychological, economic and social effects. (3 Lectures)</p> <p>B. Some locally relevant case studies of environmental disasters. (2 Lectures)</p> <p>C. Dealing with Disasters - Factors to be considered in Prevention, Mitigation (Relief and Rehabilitation) and disaster Preparedness. (3 Lectures)</p> <p>D. Human Rights issues in addressing disasters- issues related to compensation, equitable and fair distribution of relief and humanitarian approach to resettlement and rehabilitation. (3 Lectures)</p>
3	Science and Technology – I
	<p>A. Development of Science- the ancient cultures, the Classical era, the Middle Ages, the Renaissance, the Age of Reason and Enlightenment. (3 Lectures)</p> <p>B. Nature of science- its principles and characteristics; Science as empirical, practical, theoretical, validated knowledge. (2 Lectures)</p> <p>C. Science and Superstition- the role of science in exploding myths, blind beliefs and prejudices; Science and scientific temper- scientific temper as a fundamental duty of the Indian citizen. (3 Lectures)</p> <p>D. Science in everyday life- technology, its meaning and role in development; Interrelation and distinction between science and technology. (3 Lectures)</p>
4	Soft Skills for Effective Interpersonal Communication
	<p>Part A (4 Lectures)</p> <p>I) Effective Listening - Importance and Features.</p> <p>II) Verbal and Non-Verbal Communication; Public-Speaking and Presentation Skills.</p> <p>III) Barriers to Effective Communication; Importance of Self-Awareness and Body Language.</p> <p>Part B (4 Lectures)</p> <p>I) Formal and Informal Communication - Purpose and Types.</p> <p>II) Writing Formal Applications, Statement of Purpose (SOP) and Resume.</p> <p>III) Preparing for Group Discussions, Interviews and Presentations.</p> <p>Part C (3 Lectures)</p> <p>I) Leadership Skills and Self-Improvement - Characteristics of Effective Leadership.</p> <p>II) Styles of Leadership and Team-Building.</p>

HUMAN RIGHTS VIOLATIONS

Unit Structure

- 1.1 Objectives
- 1.2 Introduction
- 1.3 Meaning of Vulnerable Groups
- 1.4 Forms of Violations of Rights
- 1.5 Violations of Rights of Scheduled Castes
- 1.6 Violation of Rights of Scheduled Tribes
- 1.7 Violation of Rights of Women
- 1.8 Violation of Rights of Children
- 1.9 Violation of Rights of Minorities
- 1.10 Violation of Rights of the Disabled
- 1.11 Violation of the Rights of the Elderly People
- 1.12 Summary
- 1.13 Keywords
- 1.14 Unit End Questions
- 1.15 References

1.1 OBJECTIVES

After studying the Unit you will be able

- To understand the nature of human rights violations in India
- To classify the vulnerable groups
- Understand the nature of vulnerability
- To compare the extent of vulnerability

1.2 INTRODUCTION

In this chapter the meaning of vulnerable groups will be clearly outlined so as to help the reader understand the basic characteristics of vulnerability. It will further enhance the study of

the understanding of these groups with the ability to assess the forms of vulnerability in all these groups.

1.3 MEANING OF VULNERABLE GROUPS

Our society is a diversified patchwork of different sets of people practicing different cultures, customs and belonging to different race, religion, caste, gender and so on. These diversities however lead to a lot of inequalities in the population. In such conditions there is a growth of vulnerable groups who are the most exploited, suppressed and discriminated groups in the country. The Constitution of India uses the term 'Weaker Sections' to refer to these vulnerable groups.

1.4 FORMS OF VIOLATIONS OF RIGHTS

The unjust treatment meted out by these vulnerable groups are stated as follows:

1. **Discrimination:** These groups are discriminated on grounds of being socially and economically weaker sections of the society. In case of women and children it is much greater since the society treats them as biologically weak. Post-globalisation has witnessed the growth of several crimes as against the past due to large-scale migration and displacement. While changes in technology have made lives easier, it has further entangled relationships and the human nature in general has undergone major alterations which in turn has created a furore in the sphere of social discrimination. For e.g. Pre-Natal Diagnosis for Sexual Determination.
2. **Exploitation:** The attribute of taking undue advantage of the weaker sections in the society results in exploitation which in turn leads to anti- social behaviors .For e.g. Insurgency such as the Naxalite movement.
3. **Deprivation:** –Exploitation and deprivation are both connected to each other as one leads to the other. For example, the growing cases of malnutrition that is reported daily through the media is rampant in areas that are deprived and exploited.
4. **Neglect:** The other main attribute of vulnerability is neglect which generally happens in case of the tribals and women as they seem to be least empowered and illiterate.

5. **Violence:** The world today is experiencing major cases of violence against the weak .This has however manifested into insurgent movements and fight for survival movements.

Check your progress

1. Define the concept of Vulnerability.
2. What according to you are the chief causes for vulnerability?

1.5 VIOLATION OF RIGHTS OF THE SCHEDULED CASTES

The traditional Indian society has a complex system of stratification based on the caste system .Its grades the society in a hierarchical order which is socially visible in the behavior of different caste groups .Problems of the Scheduled caste can be enumerated as follows:

1. **Untouchability and other crimes:** Untouchability has been a major crime practiced for generations together against the lower caste. There has always been a depiction of untouchability related crimes in the media and the government of India has taken several measures to combat these sectarian crimes against the lowest in the social strata.
2. **Poverty:** Along with Untouchability comes the issue of poverty which is the most prominently held fear of the lower castes in the India society. They are denied access to landholdings and all attempts made to undermine poverty is defeated in the long run. There have been attempts to bring the scheduled caste in the mainstream .However, the success has been limited.
3. **Economic Exploitation:** Further, the main issue that the people in this group face is economic exploitation on account of illiteracy , landlessness and poverty. Attempts to alleviate their status were made by social reformers in various parts of India.

1.6 VIOLATION OF RIGHTS OF SCHEDULED TRIBES

The Scheduled Tribes, who are the original people (aborigins) from the forests are the most vulnerable group of people in India . They constitute 8.6% of the population living here with a maximum concentration of population seen in the north eastern parts of India. This group is recognized as the 'weaker' section by the Constitution of India. The violation of rights which began from the time of the British are still found .The main problems of the tribal's are as follows:

1. **Land Alienation:** The tribal's have been alienated from their native lands owned by their forefathers for generations together. This is not a post Independence phenomenon, but it was common even during the colonial days. The Forest laws not only alienated the Forest Dwellers(as know today) but further pushed them to the brinks of poverty and vulnerability .They no more live contented lives and their art and culture that was know to proliferate throughout the world , does not exist any longer.
2. **Forest Land Loss caused due to environmental degradation:** The Scheduled Tribes are landless and usually face discrimination. They are further deprived of land which is, today used for commercial purposes. Further , the forest cover has been soon depleting in India that has caused severe damages to the environmental conditions in which the tribal's lived.
3. **Displacement:** Development induced displacement has been a regular feature amongst tribals and there has been largescale migration to cities and townships on account of this.
4. **Economic Exploitation and Bonded Labour:** On account of being landless there is a need to work as agricultural labourers in the farms to earn a living for themselves .This however, takes a brutal turn and the indebted poor are made to work as bonded labourers where they are expected to work for long hours without being paid and it is the employee who decides the tenure and the nature of such work. Matters worsen when the families are attacked for not obeying orders.

5. **Lack of Basic amenities:** The tribals lack all basic necessities required to live a life in a sufficiently decent life. Right from malnutrition, disease, lack of proper food, excess intake of liquor, lack of schooling, the tribals face a larger set of problems and the government which lacks in an adequate monitoring sector finds the entire exercise of spending on their amenities, a very difficult exercise. Large scale corruption has not only led to deprivation but today the tribals are more into insurgent movements and are ready to sacrifice their lives demanding for separate states.

1.7 VIOLATION OF THE RIGHTS OF WOMEN

In India, women are the most vulnerable and this happens in almost every caste, religion and race. There is discrimination, both for being a low caste and for being a woman. Some social customs and traditions, beliefs and cultural values accord secondary status to women. The only way the change in the lives of women can come is through the change in the general mindsets of the people. With several movements fighting for the rights of women, the women today are found to be economically more independent than what they were in the yesteryears. In general, the problems faced by women are as follows:

1. **Violence is almost universal problem of women:**

Violence against women is not a new phenomenon in India. "Women in Indian society have been victims of ill-treatment, humiliation, torture, and exploitation for as long as written records of social organisation and family life are available. These records are replete with incidents of abduction, rape, murder, and torture of women.

2. **Discrimination and Decline in the Female Population:**

Normally, in the population of any country, male-female ratio remains more or less the same, that is, 50:50. In India as the census reports reveal female population has been steadily declining ever since 1901.

The male preference has led to the abuse of technology. Thousands of "unwanted female" children are killed at the stage of foetus itself. It is said that in India, out of 12 million female children born every year, around 25% of them die before they attain the age of 15. Of the children who die

every year, about 3 lakh female children, that is, more than the number of male children, die for one or the other reason. Of the children which die every year in India, the 6th child dies due to gender discrimination.

3. **Economic Exploitation:**

Women workers are given much work but are paid less wages or salary especially in the unorganized sector. "Equal pay for equal work" remains only a slogan. "Equal Remuneration Act, 1976 has proved to be a dead letter in this regard. There are also sufficient instances of such exploitation even in the organized sector.

1.8 VIOLATION OF THE RIGHTS OF CHILDREN

Etymologically, a child is any young human being below the age of full physical development or below the legal age of majority. It is only when the right environment is provided that children grow into good and successful human beings. However, today the times have changed and children from all strata of the society face severe difficulties in the form of excessive exposure to media, violence in all forms beginning right from their homes, fear and lack of trust. Following are a few issues that surround children's life's and their freedom is endangered:

1. **Lack of access to education:** Education which is believed to be the basic right of every child in the world, has been denied in most parts of India . This is very prominently seen throughout the country irrespective of the government attempts to promote education to children.
2. **Poverty and Malnutrition:** According to the World Health Organisation (WHO) globally, 30% of children under five are estimated to be stunted and 18% have low weight-for-height, and 43 million children are overweight. Optimal breastfeeding could save the lives of 1.5 million children under five every year. Nearly nine million children die every year from preventable diseases and infections: the largest killer being Diarrhoeal disease. There are over 2 billion cases of diarrhoeal disease every year and is the leading cause of malnutrition amongst children under five.
3. **Violence and Child Abuse:** According to UNICEF violence against children can be "physical and mental abuse and

injury, neglect or negligent treatment, exploitation and sexual abuse. Violence may take place in homes, schools, orphanages, residential care facilities, on the streets, in the workplace, in prisons and in places of detention." Such violence can affect the normal development of a child impairing their mental, physical and social being. In extreme cases abuse of a child can result in death. Child abuse has many forms: physical, emotional, sexual, neglect, and exploitation. Any of these that are potentially or actually harmful to a child's health, survival, dignity and development are abuse. This definition is derived from the W.H.O.

4. **Child Labour:** India is sadly the home to the largest number of child labourers in the world. The census found an increase in the number of child labourers from 11.28 million in 1991 to 12.59 million in 2001. M.V. Foundation in Andhra Pradesh found nearly 400,000 children, mostly girls between seven and 14 years of age, toiling for 14-16 hours a day in cottonseed production across the country of which 90% are employed in Andhra Pradesh. 40% of the labour in a precious stone cutting sector is children. NGOs have discovered the use of child labourers in mining industry in Bellary District in Karnataka in spite of a harsh ban on the same. In urban areas there is a high employment of children in the zari and embroidery industry. Poverty and lack of social security are the main causes of child labour.

Check your progress

1. Are the Scheduled Castes in our country suffering? If so, state the details.
2. What, according to you are the problems of the Scheduled Tribes and is the change in global environment affecting their lives?
3. What are the problems faced by Children ?

1.9 VIOLATION OF THE RIGHTS OF MINORITIES

India is a multi-lingual and a multi-religious country. Indian society is pluralistic in character from the religious and other points of view. Since a very long time people belonging to various religious communities has been living together in this country.

Though the majority of the people living in this land are Hindus [82.41%], people belonging to other religious communities such as Muslims [11.67%], Christians [2.32%], Sikhs [2%], Buddhists [0.77%], Jains [0.41%] and others [0.43%] are also living along with the Hindus by enjoying similar rights and opportunities. By virtue of their numerical strength, the Hindus constitute the majority while the rest of the religious communities come under what is known as “religious minorities”.

Regarding the concept of “minority” in the Indian context, it can be said that the term has not been properly defined anywhere in the Indian Constitution. But “minority status” has been conferred on many groups.

- i According to the Article 29 of the Constitution, any group living within the jurisdiction of India is entitled to preserve and promote its own language, script or literature, and culture.
- ii Article 30 states that a minority group “whether based on religion or language shall have the right to establish and administer educational institution of their choice. ”

Problems of Religious Minorities Racial, religious, ethnic, linguistic and other minorities are subject to some or the other problems everywhere. The four main problems which they normally face are:

- (i) **Problem of prejudice and discrimination** : Sharing a common nationality with the majority in the offing, it becomes absolutely essential for the minorities to identify with them. There are several occasions where their behavior is observed so as to check on their affiliations. This hinders their progress in the long run.
- (ii) **Problem of preserving their distinct social and cultural life**: Several customs and cultures are under scrutiny at times and lead to controversies of all types giving opportunities to aggravate the problems of minorities.

- (iii) **Problem of Protection:** Need for security and protection is very often felt by the minorities. Especially in times of communal violence, caste conflicts, observance of festivals and religious functions on a mass scale, minority groups often seek police protection. Government in power also finds it difficult to provide such a protection to all the members of the minorities. It is highly expensive also. State governments which fail to provide such protection are always criticised.
- (iv) **Problem of Communal Tensions and Riots:** Communal tensions and riots have been incessantly increasing since independence. Whenever the communal tensions and riots take place for whatever reason, minority interests get threatened; fears and anxieties become widespread. It becomes a tough task for the government in power to restore the confidence in them.

1.10 VIOLATION OF THE RIGHTS OF THE DISABLED

According to the World Health Organization “Disability is any restriction or lack (resulting from an impairment) of ability to perform in a manner or within the range considered normal for a human being”.

Around 400 million disabled persons live in the developing world. Most often they are the poorest. Poverty is the most important cause of disability. Every year millions of people go below the poverty line. This makes them more vulnerable to disability. The WHO estimates that worldwide there are 1.5 million blind children, mainly in Asia and Africa. In developing countries up to 70 per cent of blindness is either preventable or treatable. The WHO also estimates that around 50 per cent of disabling hearing impairment is also preventable. In 1995 this has affected a total of 120 million people worldwide. It is estimated that at least 10 per cent of the developing world’s population is disabled in one way or the other.

The disabled are deprived of all opportunities for social and economic development. The basic facilities like health, education and employment are denied to them. The State infrastructure is grossly inadequate and ill functioning where disabled are concerned. It is estimated that 40 million of more than 100 million children out of school have disabilities. Around 70 per cent of the disabled are unemployed. Millions are in the verge of collapsing due to severe disabilities. People with physical disabilities at least get noticed, but the others with mental illness are just written off.

Along with the physical problems they also bear the brunt of social ostracism and stigma.

The specific problems encountered by the disabled people are:

1. **Access:** Accessibility is fundamental to realization and enjoyment of any right. Though the earlier definition of access included only 'physical access' and took only architectural barrier into consideration, the modern day analysis of access is more holistic in nature. It encompasses within itself accessibility to quality education, information and communication, entertainment and technology. Emanating from the Beijing Conference and the Disabilities Act, this understanding of access provides the scope for not only full personality development but also participation in social and political life. Access to public transport, toilets, hospitals, government offices, public spaces like parks, educational institutions, places of worship are still inaccessible to people. Still whatever interventions are made are restricted to the physical access. The areas like education, teaching aids, books in Braille and interpreters for the hearing and speech impaired are still not available to large sections of the disabled.
2. **Employment:** According to the Census 2002, Disabled people constitute at least 6 per cent of our population; still their basic needs for social security, individual dignity and meaningful employment remain unmet. They are at the mercy of the government and the civil society, which have a lapsed attitude towards them. The disability Act 1995 provides for 3 per cent reservation in all categories of jobs in government sector. Though it has been three years to this notification, its implementation is still not complete.
3. **Education:** Education is yet another thing crucial for the persons with disability. In India education to the disabled is not provided as part of the mainstream but through other isolated institutions which operate on a service and charity mode. Most of the times these institutions are not fully integrated into the mainstream education system. There are only around 3000 special schools in India today. Of them only 900 are schools for the hearing impaired, 400 for children with visual impairment, 700 for those with loco motor disability and one thousand for the intellectually disabled. More than 50,000 children with disability are enrolled in the

Integrated Education for Children, a government-sponsored programme. Only a few schools have special provisions like resource rooms, special aids and special teachers. This is restricted only to big cities. Since there are no special schools or special education services in rural India, children with special needs either have to make do with the regular schools in the village or go without education. Pre-vocational and vocational training is provided only in specialized institutions and in select cities.

4. **Discrimination:** Persons with disability suffer from both social and material disability. The society, which is caught up with uniformity, cannot see people with differences with the same eye. There is lot of stigma attached to disability, which hinders their normal social interaction. The other discrimination they face is in terms of access to places. Public buildings, public transport system and other places of importance are not accessible to them. The employment opportunities available to them are also very low. They suffer the triple jeopardy of being disabled, poor and stigmatized.

1.11 VIOLATION OF THE RIGHTS OF THE ELDERLY IN INDIA

Elderly or old age consists of ages nearing or surpassing the average life span of human beings. The boundary of old age cannot be defined exactly because it does not have the same meaning in all societies. Government of India adopted 'National Policy on Older Persons' in January, 1999. The policy defines 'senior citizen' or 'elderly' as a person who is of age 60 years or above.

Out of every 10 elderly couples in India, more than 6 are forced by their children to leave their homes. With no place to go and all hopes lost, the elderly have to resort to old age homes, which do not guarantee first class treatment. In India, unlike USA, parents do not leave their children on their own after they turn 18 (of course there are exceptions), but children find it hard to accept the fact that there are times when parents want to feel the love that they once shared with them. There are times when parents just want to relax and want their children to reciprocate their care. Every parents wants to see their child grow and be successful but no parent wants their child to treat them like an unnecessary load on their responsibilities.

Every other day, we see news of parents being beaten up by their children, parents and in laws being forced to do the house hold chores, being made to live in small dungeon like rooms, their property being forcefully taken over by over ambitious children.

There are 81million older people in India-11 lakh in Delhi itself. According to an estimate nearly 40% of senior citizens living with their families are reportedly facing abuse of one kind or another, but only 1 in 6 cases actually comes to light. Although the President has given her assent to the Maintenance and Welfare of Parents and Senior Citizens Act which punishes children who abandon parents with a prison term of three months or a fine, situation is grim for elderly people in India.

According to NGOs incidences of elderly couples being forced to sell their houses are very high. Some elderly people have also complained that in case of a property dispute they feel more helpless when their wives side with their children. Many of them suffer in silence as they fear humiliation or are too scared to speak up. According to them a phenomenon called 'grand dumping' is becoming common in urban areas these days as children are being increasingly intolerant of their parents' health problems.

After a certain age health problems begin to crop up leading to losing control over one's body, even not recognizing own family owing to Alzheimer are common in old age. It is then children began to see their parents as burden. It is these parents who at times wander out of their homes or are thrown out. Some dump their old parents or grand parents in old-age homes and don't even come to visit them anymore. Delhi has nearly 11 lakh senior citizens but there are only 4 governments' run homes for them and 31 by NGOs, private agencies and charitable trusts. The facilities are lacking in government run homes.

Check your Progress

1. What are the rights specified in the Constitution of India for the Minorities?
2. State any two problems faces by the elderly in India?

1.12 SUMMARY

This unit explains the concept of vulnerability which is prominently seen certain sections of India. This makes the people feel socially unprotected and there are growing crimes and violation of rights. These groups include women ,children ,the elderly, the religious minorities and many more. Some of these groups are covered in the unit . It further enhances the knowledge of the ways in which these groups are kept away from the benefits of development.The Constitution of India however adequately mentions the protection that these groups need to be given so as to facilitate democracy.

1.13 KEYWORDS

Post-globalisation, Insurgency, Naxalite deprivation, aborigines, abduction, unorganized, prejudice, discrimination.

1.14 UNIT END QUESTIONS

- A. What is vulnerability in India and state the basic features of Vulnerability.
- B. What are the reasons for the displacement of tribals ? What are its effects?
- C. Discuss the condition of woman with regard to their health, education and employment.
- D. In what way are the rights of the disabled persons violated?

1.15 REFERENCES

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CONSTITUTIONAL PROVISIONS AND LAWS

Unit Structure

- 2.0 Objectives
- 2.1 Introduction
- 2.2 Constitutional and Legal Rights of Scheduled caste and Scheduled Tribes.
- 2.3 Prevention of Atrocities Act(against SC/ST)Act,1989 .
- 2.4 The Domestic Violence Act, 2005
- 2.5 Vishakha Guidelines for Preventing Sexual Harassment at Workplace, 1997;
- 2.6 The Child Labour (Prohibition and Regulation) Act, 1986
- 2.7 Persons With Disabilities Act, 1995; Equal Opportunities, Protection of Rights and Full Participation
- 2.8 Redressal Mechanisms at the National and State Levels
- 2.9 National Human Rights Commission
- 2.10 National Commission for Scheduled Caste and Scheduled Tribes
- 2.11 National Commission for Women
- 2.12 Minorities Commission
- 2.13 Let us sum up
- 2.14 Suggested Reading
- 2.15 Unit End Questions

2.0 OBJECTIVES

After studying the unit you will be able

- To understand the need for laws in a huge and diversified democracy like India.
- To know the laws that protect the most vulnerable in India.
- To analyse and assess the impact of these laws.

- To understand the measures taken by the government in the field of Human Rights.
- To assess the redressal mechanisms introduced by the Government.

2.1 INTRODUCTION

A description of the kind and nature of injustice done to certain sections of the Indian society was done in the previous unit and therefore an assessment on the grounds of malpractices and sufferings meted out by the vulnerable sections of the society further narrate a similar story even after more than 65 years of Independence. Mere political independence cannot solve issues in this country.

The present unit will look into specific laws framed for the upliftment of the Scheduled Caste and the Scheduled Tribes and will also analyse the implementation and the success of these, till today.

2.2 CONSTITUTIONAL AND LEGAL RIGHTS OF SCHEDULED CASTE AND SCHEDULED TRIBES.

The Constitution of India contains various provisions which provide for several rights and safeguards for the Scheduled Caste and the Scheduled Tribes .While most of these provisions are common to both ,SCs and the STs , some are exclusively meant for either of these two.

The constitutional rights of the Scheduled Caste and the Scheduled Tribes are as follows:

2.2.1 Right to Equality

Right to equality is very important in a society like ours. The purpose of this right is to establish the rule of law where all the citizens should be treated equal before the law. It has five provisions (Articles 14-18) to provide for equality before law or for the protection of law to all the persons in India and also to prohibit discrimination on the grounds of religion, race, caste, sex or place of birth.

- (i) **Equality before Law:** The Constitution guarantees that all citizens will be equal before law. It means that everyone will

be equally protected by the laws of the country. No person is above law. It means that if two persons commit the same crime, both of them will get the same punishment without any discrimination.

- (ii) **No Discrimination on the basis of Religion, Race, Caste, Sex or Place of Birth:** The State cannot discriminate against a citizen on the basis of religion, race, caste, sex or place of birth. This is necessary to bring about social equality. Every citizen of India has equal access to shops, restaurants, places of public entertainment or in the use of wells, tanks or roads without any discrimination. However, the State can make special provisions or concessions for women and children.
- (iii) **Equality of Opportunity to all Citizens in matter of Public Employment:** The State cannot discriminate against anyone in the matter of public employment. All citizens can apply and become employees of the State. Merits and qualifications will be the basis of employment. However, there are some exceptions to this right. There is a special provision for the reservation of posts for citizens belonging to Scheduled Castes, Scheduled Tribes and Other Backward Classes (OBCs)
- (iv) **Abolition of Untouchability:** Practicing untouchability in any form has been made a punishable offence under the law. This provision is an effort to uplift the social status of millions of Indians who had been looked down upon and kept at a distance because of either their caste or the nature of their profession. But, it is really very unfortunate that despite constitutional provisions, this social evil continues even today. Can you find any difference when you see a nurse cleaning a patient, a mother cleaning her child and a lady cleaning a toilet in the illustration? Why do people consider the cleaning of a toilet in a derogatory manner?

2.2.2 Right to Freedom

You will agree that the freedom is the most cherished desire of every living being. Human beings definitely want and need freedom. You also want to have freedom. The Constitution of India provides Right to Freedom to all its citizens. This Right is stipulated under Articles 19-22. The following are the four categories of Rights to Freedom:

- (a) Freedom of speech and expression.
- (b) Freedom to assemble peacefully and without arms.
- (c) Freedom to form Associations and Union.
- (d) Freedom to move freely throughout the territory of India.
- (e) Freedom to reside and settle in any part of India.
- (f) Freedom to practise any profession or to carry on any occupation, trade or business.

The purpose of providing these freedoms is to build and maintain an environment for proper functioning of democracy. However, the Constitution has authorized the State to impose certain reasonable restrictions on each of them.

2.2.3 Right against Exploitation

Have you ever thought how many ways exploitations take place in our society? You might have seen a small child working in a tea shop or a poor and illiterate person being forced to work in the household of a rich person. Traditionally, the Indian society has been hierarchical that has encouraged exploitation in many forms. Which is why, the Constitution makes provisions against exploitation. The citizens have been guaranteed the right against exploitation through Articles 23 and 24 of the Constitution. These two provisions are:

1. **Prohibition of traffic in human beings and forced labour:**
Traffic in human beings and begar and other similar forms of forced labour are prohibited and any breach of this provision shall be an offence punishable in accordance with law. Traffic in human beings means selling and buying of human beings as material goods. Trafficking, especially of young women, girls and even boys is continuing as an illegal trade. Earlier especially in the feudal Indian society, people belonging to the poor and downtrodden sections were made to do work free of charge for landlords and other powerful people. This practice was Begar or forced labour.
2. **Prohibition of employment of children in factories, etc.:**
As the Constitution provides, no child below the age of fourteen years shall be employed to work in any factory or mine or engaged in any other hazardous employment. This

right aims at eliminating one of the most serious problems, child labour, that India has been facing since ages.

Some important laws protecting the rights of the vulnerable are:

2.3 THE PREVENTION OF ATROCITIES (AGAINST SC/ST) ACT, 1989

The Scheduled Castes and Tribes (Prevention of Atrocities) Act, 1989 was enacted by the [Parliament of India](#) (Act 33 of 1989), to prevent atrocities against [scheduled castes and scheduled tribes](#). The Act is popularly known as POA, the SC/ST Act, the Prevention of Atrocities Act, or simply the *Atrocities Act*.

The SCs and STs (Prevention of Atrocities) Act, 1989 with stringent provisions (which extends to whole of India except the State of Jammu & Kashmir) was enacted on 9 September 1989. Section 23(1) of the Act authorises the Central Government to frame rules for carrying out the purpose of the Act. The purpose of the Act was to help the social inclusion of [Dalits](#) into Indian society, but the Act has failed to live up to its expectations.

The Scheduled Castes and Scheduled Tribes (Prevention of Atrocities) Act, 1989 (hereinafter referred to as 'the said Act') was enacted in order to prevent the commission of atrocities against members of Scheduled Castes and Scheduled Tribes and to provide for special courts for the trial of offence under the said Act as also to provide for the relief and rehabilitation of victims of such offences "Atrocity" has been defined under section 2 of the said Act to mean an offence punishable under section 3.

Main provisions of the Act are as under. -

- (i) Defines offences of atrocities and prescribes punishment there for, (Section 3).
- (ii) Punishment for wilful neglect of duties by non-SC/ST Public servants (Section 4)
- (iii) Designating for each District a Court of Session as a Special Court for speedy trial of offences under the Act (Section 14).
- (v) Appointment of Public Prosecutors/Special Public Prosecutors for conducting cases in special courts (Section 15).

- (vi) Preventive action to be taken by the law and order machinery (Section 17).

Salient provisions of the Scheduled Castes and the Scheduled Tribes (Prevention of Atrocities) Rules, 1995 notified under the POA Act are as under:-

1. It defines various types of atrocities against the SCs/STs. These include forcing an SC or ST person from drinking or eating any inedible or obnoxious substance; forcibly removing clothes; parading him/her naked or with painted face or body; compelling to do 'begar' or other forms or forced labour.
2. There are stringent punishments prescribed for such acts of atrocities.
3. Crimes committed by non-SCs or STs are considered as severe offences whereas there is no mention of any crimes done by the SCs or STs themselves.
4. It provides for compensation, rehabilitation and relief for victims of such atrocities.
5. It also makes provisions for setting up a mandatory, periodic monitoring system at the district, state and national levels.

2.4 THE DOMESTIC VIOLENCE ACT, 2005

The phenomenon of domestic violence is widely prevalent but has remained largely visible in the public domain. Presently, where a woman is subjected to cruelty by her husband or his relatives, it is an offence under Section 498-A of the Indian Penal Code. The civil law does not however address this phenomenon in its entirety.

It is, therefore, proposed to enact a law keeping in view the rights guaranteed under articles 14, 15 and 21 of the Constitution to provide for a remedy under the civil law which is intended to protect the women from being victims of domestic violence and to prevent the occurrence of domestic violence in the society.

The Bill, seeks to provide for the following:-

- (i) It covers those women who are or have been in a relationship with the abuser where both parties have lived

together in a shared household and are related by consanguinity, marriage or through a relationship in the nature of marriage or adoption. In addition, relationships with family members living together as a joint family are also included. Even those women who are sisters, widows, mothers, single women, or living with the abuser are entitled to legal protection under the proposed legislation. However, whereas the Bill enables the wife or the female living in a relationship in the nature of marriage to file a complaint under the proposed enactment against any relative of the husband or the male partner, it does not enable any female relative of the husband or the male partner to file a complaint against the wife or the female partner.

- (ii) It defines the expression “domestic violence” to include actual abuse or threat or abuse that is physical, sexual, verbal, emotional or economic. Harassment by way of unlawful dowry demands to the woman or her relatives would also be covered under this definition.
- (iii) It provides for the rights of women to secure housing. It also provides for the right of a woman to reside in her matrimonial home or shared household, whether or not she has any title or rights in such home or household. This right is secured by a residence order, which is passed by the Magistrate.
- (iv) It empowers the Magistrate to pass protection orders in favour of the aggrieved person to prevent the respondent from aiding or committing an act of domestic violence or any other specified act, entering a workplace or any other place frequented by the aggrieved person, attempting to communicate with her, isolating any assets used by both the parties and causing violence to the aggrieved person, her relatives or others who provide her assistance from the domestic violence.
- (v) It provides for appointment of Protection Officers and registration of non-governmental organisations as service providers for providing assistance to the aggrieved person with respect to her medical examination, obtaining legal aid, safe shelter, etc.

Check your progress

1. What are the provisions under the Right Against Exploitation?
2. Is the protection against untouchability ensured through the Prevention of Atrocities Act, 1989?
3. Describe any one way in which women are protected against domestic violence through the Domestic violence Act, 2005.

2.5 VISHAKHA GUIDELINES FOR PREVENTING SEXUAL HARASSMENT AT WORKPLACE, 1997

The Supreme Court in the case of Vishakha v. the State of Rajasthan laid down for the first time strictures that aimed at protecting a woman employee by giving her right to a safe/healthy working environment. In the decision, the Court also defined sexual harassment and recognised it to be a paramount violation of human rights. The court thereby laid down certain mandatory and binding guidelines to be followed by all workplaces, belonging to the public and private sectors and made it mandatory for every employer to ensure a safe, harassment free working environment for the women.

THE VISHAKHA CASE

Bhanwari Devi was a village-level social worker or a saathin of a development programme run by the State Government of Rajasthan, fighting against child and multiple marriages in villages. As part of this work, Bhanwari, with assistance from the local administration, tried to stop the marriage of Ramkaran Gujjar's infant daughter who was less than one year old. The marriage took place nevertheless, and Bhanwari earned the ire of the Gujjar family. She was subjected to social boycott, and in September 1992 five men including Ramkaran Gujjar, gang raped Bhanwari in front of her husband, while they were working in their fields. The days

that followed were filled with hostility and humiliation for Bhanwari and her husband. The only male doctor in the Primary Health Centre refused to examine Bhanwari and the doctor at Jaipur only confirmed her age without making any reference to rape in his medical report. At the police station, the women constables taunted Bhanwari throughout the night. It was past midnight when the policemen asked Bhanwari to leave her lehenga behind as evidence and return to her village. She was left with only her husband's bloodstained dhoti to wear. Their pleas to let them sleep in the police station at night, were turned down. The trial court acquitted the accused, but Bhanwari was determined to fight further and get justice. She said that she had nothing to be ashamed of and that the men should be ashamed due to what they had done. Her fighting spirit inspired fellow saathins and women's groups countrywide. In the months that followed they launched a concerted campaign for justice for Bhanwari. On December 1993, the High Court said, "it is a case of gang-rape which was committed out of vengeance". As part of this campaign, the groups had filed a petition in the Supreme Court of India, under the name 'Vishaka', asking the court to give certain directions regarding the sexual harassment that women face at the workplace. The result is the Supreme Court judgement, which came on 13th August 1997, and gave the Vishaka guidelines.

The Guidelines issued by the court said that

- (i) It shall be the duty of the employer or other responsible [persons](#) in workplace or other institutions to prevent or deter the acts of sexual harassment and to provide the procedures for the resolution, settlement or prosecution of acts of sexual harassment by taking all steps required.
- (ii) The rules/regulations of the government and the public sector bodies relating to conduct and discipline should include rules/regulation prohibiting sexual harassment and provide for appropriate penalties in such rules against the offender.
- (iii) Where such conduct amounts to a specific offence under the Indian Penal Code or under any law, the employer shall initiate appropriate action in accordance with law by making a complaint with an appropriate authority.
- (iv) An appropriate complaint mechanism should be created in the organisation for redressal of the complaint made by the

victim. The Complaints Committee will be headed by a woman and not less than half of its members shall be women.

India is rapidly advancing in its developmental goals and more and more women are joining the workforce. It is the duty of the state to provide for the wellbeing and respect of its citizens to prevent frustration, low self-esteem, insecurity and emotional disturbance, which, in turn, could affect business efficacy, leading to loss of production and loss of reputation for the organisation or the employer. In fact, the recognition of the right to protection against sexual harassment is an intrinsic component of the protection of women's human rights. It is also a step towards providing women independence, equality of opportunity and the right to work with dignity.

2.6 THE CHILD LABOUR (PROHIBITION AND REGULATION) ACT, 1986

Child Labour (Prohibition & Regulation) Act, 1986 was the culmination of effort and ideas that emerged from the deliberations and recommendations of various committees on child labour. Significant among them are the National Commission on Labour (1966-69), Gurupadaswamy Committee on Child Labour (1979). Sanat Mehta Committee (1984) and others.

The basic objective of the Child Labour (Prohibition & Regulation) Act 1986, is to ban employment of children below the age of 14 years in factories, mines and hazardous employment's and to regulate the working conditions of children in other employments

The act:

- Bans the employment of children, i.e. those who have not completed their 14th year, in specified occupations and process;
- Regulates the working conditions of children in occupations where they are not prohibited from working;
- Lays down penalties for employment of children in violation of the provisions of this Act, and other Acts which forbid the employment of children ;

- Brings out uniformity in the definition of "Child " in related laws.

Section 5 of the Child Labour (Prohibition & Regulation) Act 1986, provides for the constitution of a child labour Technical Advisory Committee to advise the Central Government for the purpose of addition of occupations and processes to the schedule of the Act.

More recently ,employment of Children as domestic servants and in dhabas(crude form of hotels) has been banned from October 2006.

2.7 THE PERSONS WITH DISABILITIES ACT, 1995; EQUAL OPPORTUNITIES, PROTECTION OF RIGHTS AND FULL PARTICIPATION

“The Persons with Disabilities (Equal Opportunities, Protection of Rights and Full Participation) Act, 1995” has come into enforcement on February 7,1996 as an important landmark and significant step in the direction to ensure full participation of persons with disabilities in the nation building. The Act provides, preventive and promotional aspects of rehabilitation like education, employment and vocational training, reservation, research and manpower development, creation of barrier-free environment, rehabilitation of such persons, unemployment allowance, special insurance scheme for the disabled employees and establishment of homes for persons with severe disability etc.

Main Provisions of the Act are:

- 1 **Prevention and Early Detection of Disabilities:-** Surveys, investigations and research shall be conducted to ascertain the cause of occurrence of disabilities. Various measures shall be taken to prevent disabilities. Staff at the Primary Health Centre shall be trained to assist in this work. All the children shall be screened once in a year for identifying “at – risk” cases. Awareness campaigns shall be launched and sponsored to disseminate information.

Measures shall be taken for pre-natal, perinatal, and postnatal care of the mother and child.

- 2 **Education-** Every child with disability shall have the rights to free education till the age of 18 yrs in integrated schools or

special schools .Appropriate transportation, removal of architectural barriers, restructuring of curriculum and modifications in the examination system shall be ensured for the benefit of children with disabilities. Children with disabilities shall have the right to free books, scholarships, uniform and other learning material. Special schools for children with disabilities shall be equipped with vocational training facilities. Non-formal education shall be promoted for children with disabilities.

3. **Employment-** Suitable schemes shall be formulated for the training and welfare of persons with disabilities. Providing equality in employment is also equally important.
4. **Affirmative Action-** Allotment of land shall be made at concessional rates to the people with disabilities for House, Business ,Special Recreational Centres, Special Schools and Factories by Entrepreneurs with Disability.
5. **Non-Discrimination-** Public buildings, rail compartments, buses, ships and air-crafts will be designed to give easy access to disabled people. In all public places and in waiting rooms, toilets shall be wheel chair accessible. Braille and sound symbols are also to be provided in lifts. All the places of public utility shall be made barrier-free by providing ramps.
6. **Grievance Redressal-** In case of violation of rights as prescribed in that act, people with disabilities may move an application to Chief Commissioner for Person with Disabilities in the Centre or Commissioner for Persons with Disabilities in States.

2.8 REDRESSAL MECHANISMS AT THE NATIONAL AND STATE LEVELS

Understanding the rights of people in a democracy is not enough. There is also a need to understand the implementation of these rights . Legal provisions merely do not provide the atmosphere and the eligible conditions to enjoy citizenship in a democracy. There have been several philosophies that stated the need for a sovereign to ensure good governance.Man by nature , is selfish and it is rare that he would sacrifice his goals of achieving the maximum from a free society. Hence the need to protect the vulnerable becomes an utmost necessity in the present modern world.

Our Constitution by article 32 and Article 226 has recognised every individual's rights to seek redressal from the court if his/her rights are violated. These are termed as the Right to Constitutional Remedies. The judiciary, especially the Supreme Court has been empowered to accept/entertain writ petition from person or persons whose rights are violated.

These constitution makes provisions for such institutions with the details of their establishment, tenure, appointment and powers clearly specified to avoid disputes.

The appointment of such redressal mechanisms are done at all federal levels to ensure smooth and democratic functioning. There are state and National level Commissions developed in this regard. A few important redressal tools in the form of Commissions are discussed in the unit .

2.9 THE NATIONAL HUMAN RIGHTS COMMISSION (NHRC)

The National Human Rights Commission (NHRC) of [India](#) is an autonomous public body constituted on 12 October 1993 under the Protection of Human Rights Ordinance of 28 September 1993. It was given a statutory basis by The Protection of Human Rights Act, 1993 (TPHRA). The NHRC is the [national human rights institution](#), responsible for the protection and promotion of human rights, defined by the Act as "rights relating to life, liberty, equality and dignity of the individual guaranteed by the Constitution or embodied in the International Covenants".

The Commission undoubtedly has some achievements to its credit. It has succeeded in persuading the Central Government to sign the United Nations Convention against Torture and Other Forms of Cruel, Inhuman and Degrading Punishment or Treatment. It has brought into sharp focus the problem of custodial deaths and taken steps to see that these are not suppressed by the state agencies and that the guilty persons are made to account for their sins of commission and omission. It has also helped in designing specialised training modules on human rights for introduction in the educational and training institutions.

The Commission has a wide mandate including civil and political rights, economic, social and cultural rights, and group rights. Section 12 lays down that the Commission shall perform all or any of the following functions, namely:

- Inquiring, suo motu, or on petitions, presented to it by victims, or any persons on their behalf, or on a direction or order of any court, into complaints of violation of human rights or abetment thereof, or negligence in the prevention of such violation, by a public servant.
- Intervening in any proceeding involving any allegation of violation of human rights pending before a Court, with the approval of such Courts.
- Visiting, any jail or other institution under the control of the State Government, where persons are detained or lodged for purposes of treatment, reformation or protection, for the study of the living conditions of the inmates thereof and making recommendations.
- Reviewing the safeguards provided by, or under, the Constitution, or any law for the time being in force, for the protection of human rights, and recommending measures for their effective implementation.
- Reviewing the factors, including acts of terrorism, that inhibits the enjoyment of human rights, and recommending appropriate remedial measures.
- Studying treaties and other international instruments on human rights, and making recommendations for their effective implementation.
- Undertaking and promoting research in the field of human rights.
- Spreading human rights literacy amongst various sections of society, and promoting awareness of the safeguards available for the protection of these rights, through publications, the media, seminars and other available means.
- Encouraging the efforts of non-governmental organisations, and institutions working in the field of human rights.
- Undertaking such other functions as may be considered necessary for the promotion of human rights.

Check Your Progress

1. Which communities have been recognised by the Constitution of India as “minorities”?
2. What are the provisions made in the law protecting the rights of the disabled?
3. Trace the genesis of the Vishaka Guidelines on the law protecting Sexual Harrassment at workplace,1997.

2.10 THE NATIONAL COMMISSION FOR SCHEDULED CASTES AND THE NATIONAL COMMISSION FOR SCHEDULED TRIBES

The first Commission for the SCs and the STs was set up in August 1978. It was set up as a National level Advisory Body to advise the government on board policy issues and levels of development of Scheduled Castes and Scheduled Tribes. It was in 1990 that the body was proclaimed Statutory.

It was later that the National Commission for Scheduled Caste and Scheduled Tribes was bifurcated by the Constitution (Eighty-Ninth Amendment) Act, 2003 to establish separate Commissions for SCs and STs. The NCST was established in February 2004.

The Functions of both the Commissions can be envisaged as follows:

- To investigate and monitor all matters relating to the safeguards provided for the Scheduled Castes/Scheduled Tribes under this Constitution or under any other law for the time being in force or under any order of the Government and to evaluate the working of such safeguards;

- To inquire into specific complaints with respect to the deprivation of rights and safeguards of the Scheduled Castes/Scheduled Tribes;
- To participate and advise on the planning process of socio-economic development of the Scheduled Castes/Scheduled Tribes and to evaluate the progress of their development under the Union and any State;
- To present to the President, annually and at such other times as the Commission may deem fit, reports upon the working of those safeguards;
- To make in such reports recommendations as to the measures that should be taken by the Union or any State for the effective implementation of those safeguards and to introduce other measures for the protection, welfare and socio-economic development of the Scheduled Castes/Scheduled Tribes; and
- To discharge such other functions in relation to the protection, welfare and development and advancement of the Scheduled Castes /Scheduled Tribes as the President may, subject to the provisions of any law made by Parliament, by rule specify.

2.11 THE NATIONAL COMMISSION FOR WOMEN

The National Commission for Women was set up as statutory body in January 1992 under the National Commission for Women Act, 1990 (Act No. 20 of 1990 of Govt.of India) to:

- review the Constitutional and Legal safeguards for women ;
- recommend remedial legislative measures ;
- facilitate redressal of grievances and
- advise the Government on all policy matters affecting women.

In its advisory role, the Commission is to participate and advise on the planning process of socioeconomic development of women. The commission is empowered to undertake research and special studies or investigations into specific problems or situations arising out of discrimination and atrocities on women and

recommend measures to deal with these. Through its annual and other reports it can make recommendations for the effective implementation of safeguards provided to women in the Constitution. It has a specific task of recommending amendments to meet any lacunae, inadequacies or shortcoming in the existing legislations. The Commission has so far reviewed about 23 laws and made more than 700 recommendations to the government. The Commission has also brought out many special studies.

2.12 MINORITIES COMMISSION

The Recognition and protection of minority rights under a legal framework has two fold objectives –firstly to prevent state from being oppressive against the minorities as in a democratic setup government is run by majority, secondly to provide the minority a protective zone whereby they can preserve their separate identity while contributing in national development and progress. The Constitution of India neither defines the term minority nor provides details relating to the geographical and numerical specification of this concept though it talks about the rights of “minorities” under Article 29 and 30.

In order to preserve the country’s secular traditions, to promote national integration and to remove any feeling of inequality and discrimination amongst minorities, the Government of India constituted a Minorities’ Commission in 1978 through administrative order which was later on regularized by ‘The National Commission for Minorities Act, 1992.’ The Commission discharges the following’ functions under Section 9 of the Act :

- evaluate the progress of the development of minorities;
- monitor the working of the safeguards provided in the Constitution and other enactments;
- make recommendations to appropriate government for the effective protection of the interests of minorities;
- look into specific complaints regarding deprivation of rights and safeguards of the minorities and take up such matters with the appropriate authorities;
- studies into problems arising out of any discrimination against minorities and recommend measures for their removal;

- conduct studies and researched analysis on the issues relating to socio-economic and educational development of minorities;
- suggest appropriate measures in respect of any minority to be undertaken by the appropriate government;
- make periodical or special reports to the Central Government on any matter relating to minorities and in particular difficulties faced by them; and
- any other matter which may be referred to it by the Central Government

Check your progress

1. *Specify the need for redressal from violation of rights?*
2. *Do you consider the National Commission for Women as an important body protecting the rights of women?*

2.13 LET US SUM UP

Rights are what make a democracy work and helps in the development of the masses.

Every democracy should make provisions to protect every citizen from being exploited.

Our Constitution makers worked hard to ensure that all citizens ,irrespective of their caste, creed,gender and place of birth are equally assigned rights. This however, was never cherished and the country saw a huge gap in development which resulted in the government taking measure to provide social and economic security to the people.

This has been done through enacting laws and through initiating redressal mechanisms. There is an urgent need to look

into the working of these so as to make the democracy work in a free and fair manner.

2.14 SUGGESTED READING

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2. Prof. Manohar R. Wadhawani., Some Aspects of Human
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4. Prof. Manohar R. Wadhawani, The Philoosphy and Practice of Human Rights – Chetana Publishers,2003.
5. Mahesh Bhagwat, Prakash Dongre and Meghana Shinde – Chakne., Foundation Course II – Sheth Publishers, 2008.

2.15 UNIT END QUESTIONS

1. Do you believe that legal provisions alone can resolve the issues of the vulnerable groups in India?
2. What is the fundamental Right against Exploitation?
3. State the provisions made under the THE PREVENTION OF ATROCITIES (AGAINST SC/ST) ACT, 1989
4. Has the law preventing women against domestic violence empowered women?
5. What are redressal mechanisms? Describe any one such mechanisms introduced by the Government of India for the Indian citizens.
6. What are the main functions of the National Human Rights Commission of India?

3

DEALING WITH ENVIRONMENTAL CONCERNS - I

Unit Structure

- 3.0 Objectives
- 3.1 Introduction
- 3.2 Threat to Environment from Extinction of Species :
- 3.3 Habitat Loss
- 3.4 Degradation of Environment
- 3.5 Pollution
- 3.6 Climate Change
- 3.7 Some locally relevant case studies of environmental disasters.
- 3.8 Unit End Questions

3.0 OBJECTIVES

To make students aware of

- Threats to environment from extinction of species
- Habitat loss, Pollution and Climate Change
- Environmental disasters

3.1 INTRODUCTION

Atmosphere, water and soil are the most important components of environment in which we live. Atmospheric factors like rainfall, humidity, temperature, sunlight, etc. have a profound effect on living of various organisms. Proper environmental conditions are essential for survival of life on the Earth. In recent years with the development of science and technology, industrialization, urbanization, development of transport & communication factors of environment are getting adversely affected and have created threat of destruction of environment. Thus human activities are considered as serious threats arising from environmental degradation. Number of plants and animals are getting extinct because of loss of their habitat by increasing population and generation of pollutants in the environment. Some

scientists have estimated that 50 % of presently existing species of various plants and animals may become extinct by 2100.

3.2 THREAT TO ENVIRONMENT FROM EXTINCTION OF SPECIES

The major threat to environment in the next century is mass extinction of plants and animals; Rapid disappearance of number of species is considered as one of the earth's environmental worries, which is more serious problem than pollution, global warming and depletion of ozone layer. Many biologists believe that the rate at which mass extinction is going on, 20 % of the living species are likely to disappear within thirty years by human activities such as deforestation and loss of habitat for animals.

Extinction :

In ecology & biology extinction is end of organism or group of organisms normally a species. As species becomes extinct when the last extinct member dies.

Today man has made tremendous progress in his standard of living, health, education, security and availability of quantity of food, comfort mobility, recreation & sports. But ill effects of these developments are often not seen because they happen slowly, unnoticeable and invisibly.

Some of the threats to the Environment are as follows :

- Threats to atmosphere and water cycle are climatic changes, rise in sea level, atmospheric pollution.
- Threats to land and soil: soil erosion, species diversity and over exploitation of water.
- Threat to human : health, food, water, shelter, recreation etc.

Check your progress

Q.1 What are different threats to environment from extinction of plants and animals ?

Q.2 Explain the term extinction.

3.3 HABITAT LOSS

Habitat loss is the process by which natural habitat is damaged or destroyed to such an extent that it is no longer capable of supporting species and ecological communities which naturally occur there.

Habitat loss in Terrestrial Ecosystem is because of following factors.

Human Activities :

Habitat loss may be directly by human activities which involve clearing of forest land for activities such as agriculture, mining, construction of dams for irrigation and hydro-electric power and urbanization and indirectly by certain human activities which are responsible for air and water pollution, climate change and introduction of invasive species.

Natural factors :

Habitat loss also occurs because of some natural factors such as earthquakes, volcanic eruptions, flood and fluctuations in the climatic condition.

Rapid growth of population :

Habitat loss is increasing day by day with rapidly growing human population. As population increases man uses more land for agriculture & settlements which leads to encroachment on neighbouring forest and habitat loss of birds & animals.

Habitat Loss in Aquatic Ecosystem :

➤ **Coastal Development:**

With the development of tourism facilities causeways, construction of jetty there is a direct loss of marine habitat. The habitats most affected are salt marsh and mangroves. In addition to this development of ports, dredging and dumping etc are responsible for habitat loss in coastal areas.

➤ **Impact on Mangroves:**

Mangroves are important habitat and food source for number of aquatic species. Today, mangroves are threatened for

fire-wood being converted into shrimp farms and reclaimed for housing, development of industries.

➤ **Pollution:**

Most of coastal coral reefs have degraded severely due to runoff pollution, water from the from the land.

- **Oil spills:** Oil from off shore drilling storage tankers, pipeline, ships etc flow from the surface where it harms to species living within its reach.

Impact of Habitat Loss:

- a) Habitat loss and human population:

The destruction of tropical rain forest is responsible to reduce the earth's ability by to produce oxygen and consume carbon dioxide. Thus there is increase of carbon dioxide levels which is one of the important factor responsible for global climate change.

- b) Due to destruction of habitat of birds & animals:

Aesthetic uses such as birds watching. Recreational uses like hunting, eco tourism etc are declining.

- c) Habitat destruction has altered carbon, sulphur and nitrogen cycle which has increased the frequency and severity of acid rain and killing of fish in lakes & rivers.

- d) Effect on rural population:

All over the world poor people suffer worst when natural habitat gets destroyed as it results in availability of less natural habitat and less means of natural recourses per capita.

The greatest threat to organisms and bio-diversity is the process of habitat loss . Today large number of bird species and animals species are significantly threatened by habitat loss.

Protection of Habitat :

To protect habitat of many plants, birds & animals government bodies at local, national & international level need to emphasize the following.

- Protecting remaining natural habitats from human encroachment.
- Educating people about importance of natural habitat and bio-diversity.
- Implementing family planning programmes in areas where there is rapid growth of population.
- Developing technology to increase agricultural production than simply increasing fatal land under agriculture.

Check your Progress

- Q.1 Define the term Habitat Loss ?
- Q.2 What are the causes of Habitat Loss in Terrestrial Ecosystem?
- Q.3 What are the causes of Habitat Loss in Aquatic Ecosystem?
- Q.4 Discuss the impact of habitat loss ?
- Q.5 Suggest some remedial measures to protect natural habitat?

3.4 DEGRADATION OF ENVIRONMENT

Degradation of environment is the deterioration of environment through depletion of resources such as air, water and soil, the destruction if ecosystems and extinction of wild life.

The degradation of environment is defined as any change or disturbance to the environment perceived to be undesirable.

The United Nations International strategy for Disaster Reduction defined environmental degradation as **“the reduction of the capacity of the environment to meet social and ecological objectives and needs”**

Degradation of environment is basically because of pollution and climate change.

Check your Progress

Q.1 What is degradation of environment ?

3.5 POLLUTION

Water pollution and Air pollution is mainly responsibility for degradation of environment.

3.5.1. Water Pollution

One major component of degradation of environment is the depletion of the resources of fresh water on the Earth. Of the 6 billion people on the Earth, some 1.2 billion people lack access of safe drinking water because:

- **Poisonous Rainwater:** Water collected from rain has become poisonous particular in areas of high population densities and industry. Its nutrient components of nitrites, nitrates, sulphur dioxide and sulphates have become poisonous to humans.
- **Poisonous Groundwater:** Particularly in highly productive farming areas, where productivity is achieved by generous applications of fertilizers and agrichemicals for pest control, ground water, aquifers and rivers are becoming more and more polluted. It becomes more difficult to find drinking water.
- **Salinated Water:** In coastal areas, as aquifers become overexploits and their levels drop, it allows seawater to penetrate and to take its place.
- **Safe Water:** More than a billion to not have access to safe water, and their numbers are increasing. Water is unsafe for

drinking, when mixed with surface run-off, human or animal excrement or when it is too muddy.

3.5.2 Air Pollution

In the 20th century, air pollution killed 25-40 million people, roughly equal to the combined kill of World War 1 and 2.

- **Ultraviolet Radiation:** Due to industrial gases like CFCs, the protective ozone layer has thinned, it causes more skin cancer.
- **Air Rain:** Most old buildings were built with limestone, cemented together with limestone cement. Acid rains of sulphuric acid and nitric acid dissolve both stone and mortar, resulting in irreparable damage.
- **Energy:** The burning of fossil fuels in power plants and industries causes major pollution to the atmosphere, causing acidification of lakes and dying forests.
- **Transportation:** The major sources of air pollutions are transportation engines. The combustion of fuels in automobiles products number of primary air pollutions: nitrogen oxides, gaseous hydrocarbons and carbon monoxide, as well as, large quantities of particulates chiefly led.

A recently discovered result of air pollution on increasing “hole” in the ozone layer in the atmosphere above Antarctica, coupled with growing evidence of global ozone depletion. This can increase the amount of ultraviolet radiation reaching the earth, which could damages crops and plants and can lead to skin cancer and cataracts.

Check your Progress

Q.1. Discusses pollution as a cause of degradation of environment?

3.6 CLIMATE CHANGE

The recent phenomenon of global warming is also considered to be a major factor of degradation of environment.

3.6.1 Climate change and Temperature

Climate change affects the Earth's water supply in large number of ways. It is predicted that the mean global temperature will rise in coming years due to a number of forces affecting the climate. The amount of CO₂ will rise. Both of these will influence water resources, since evaporation strongly depends on temperature and moisture availability.

- **Snow Season:** Temperature increase can decrease the length of the snow season in winter and increase the intensity of snowmelt in warmer season, leading to peak runoff of snow melt earlier in the season, affecting soil moisture, flood and drought risk etc.
- **Thermal Expansion of Water:** Thermal expansion of water and increased melting of oceanic of oceanic glacier melt from increase in temperature gives war to a rise in sea level.
- **Impact on Ecosystem :** Increase in water temperature can also affect ecosystems greatly because of a species sensitivity to temperature and also in inducting changes in a body of waters self purification from decreased amount of dissolved oxygen in the water due to rise in temperature.

3.6.2 Climate Change and Precipitation

While most of the attention about climate change is directed towards **global warming** and **greenhouse effect**, some of the most severe effects of climate change are likely to be from changes in precipitation, evapotranspiration, runoff, and soil moisture.

It is generally expected that, on average, global precipitation will increase, with some areas receiving increases in precipitation and some decrease.

3.6.3 Floods and Droughts:

Changes in precipitation affect the timing and magnitude of floods and droughts, shift in runoff processes, and alter groundwater rates.

3.6.4 Changes in Vegetation Pattern:

Vegetation patterns and growth rates will be directly affected by the shift precipitation amount and distribution. It will also affect agriculture as well as natural ecosystems.

3.6.5 Monster Rains:

Rainfall has become heavier almost everywhere in the world. In some areas a single rain may drop up to two times of rainfall in a single day. Such monster rains destroy lowland infrastructure, while killing tens of thousands of people. For example, Bangladesh in 1991, Hurricane Andrew 1992, Cyclone Mitch 1998, Cloudburst in Mumbai in 2004 etc.

Check your Progress

Q.1 Discuss climate change as a cause of degradation of environment.

3.7 SOME LOCALLY RELEVANT CASE STUDIES OF ENVIRONMENTAL DISASTERS.

3.7.1. Mumbai floods 2005.

Large numbers of people were stranded on the roads, lost their homes and many walked for long distances back home from work on 26th July, 2005. The floods were caused by eighth heaviest ever recorded 24 hours rainfall figure of 944 mm which lashed the metropolis on 26th July, 2005 and intermittently continued for the next day 644 mm rain was received within 12 hours period between 8.00 am to 8.00 pm.

Local train movement came to a halt by 2.30 p.m. due to the water logging on the tracks, due to which vehicular traffic intensity on roads increased. Water logging and submergence of certain low lying pockets of the region such as Dharavi, Bandra-Kurla Complex, Chunabhatti, Chembur, Ghatkopar, Milan Subway and Sion either slowed down traffic, or in some areas, brought it to a grinding halt.

With sudden rush of vehicles after around 4 p.m., it took about 4 hours for a BEST bus to reach from Churchgate to Mahim.

The situation worsened when the cellphone network went down around 5 p.m. Land-lines of M.T.N.L. was also only partially functional. Adding to the chaos was the lack of public information. Radio stations and many television stations did not receive any weather warnings or alerts by the civic agencies. The Met department blamed it on the lack of sophisticated weather radars which would have given a 3 hours prior warning which came due to high tides.

The Powai Lake had started overflowing at 4 p.m. and discharged 5.95 million cubic meters of water into the Mithi River. The rainfall hydrographs of 26th & 27th July later revealed that two flood waves were generated in the streams and river basins of Mumbai, one between 2.30 & 20.30 p.m. – coinciding with the high tide period and another between 8 & 10 p.m. Normally, the second wave have harmlessly drained because of the prevalent low-tide. But that did not happen because the accumulated water from the first flood wave had yet not flushed out effectively during the ebb period because of a choked drainage system. The result was that the flood situation kept on aggravating throughout the night. There was some relief in sight only when the second ebb period commenced at 6 p.m. on 28 July.

Due to submergence of the power stations and substations suburban power supply was suspended from the evening on 26 July and it was restored only after waters receded.

Thousands of school children were stranded due to flooding and could not reach home for up to 24 hours. The following two days were declared as school and college by the state government.

The entire Government machinery along with the local offices of the MCGM immediately got into action for the desired relief, rescue and thereafter in the mission for restoring the city to normally.

Threat to public health

The rain water caused the sewage system to overflow and all water lines were contaminated. The Government ordered all housing societies to add chlorine to their water tanks while they decontaminate the water supply.

Thousand of animal carcasses floated in the waters, raising concerns about the possibility of disease.

Reports in the media warned of the threat of waterborne diseases and hospitals and health centers geared up to distribute free medicines to check any outbreak.

3.7.2. Fire at sea

While Mumbai was recovering from the onslaught of weather, after torrential rains on 26th July, 2005 there was another disaster in the making. This was at the sea. It took place at 4.05 p.m. on 27th July at ONG's Bombay High North platform.

Samudra Suraksha, a multi-purpose vessel was sent to evacuate a sick employee from the platform. A vessel such as this, use usually for carrying out maintenance and repairs at the rigs, doesn't use anchor to avoid causing damage to the underwater pipelines. Instead it uses thrusters and reversers on either side, for stabilizing the ships position.

This dynamic positioning arrangement of thrusters and reversers computer controlled. The moment the captain of the ship realized that the vessel was loosening its position he should have moved out immediately. However, at some stage there must have been human error and before the captain could react the vessel collided with the part of structure which unfortunately happen to be the main gas pipeline causing a rupture. The frictional sparks that from flew off from this ignited the gas leaking from the pipeline. This resulted in serious gas leakage engulfing the platform and the vessel in a major in a major inferno.

A question was asked why a vessel had to be send to pickup a sick employee when a helicopter could have easily done this. ONGC's answer is that the choppers were mostly grounded due to heavy rains. The only way they could have evacuated the employee was by one of these vessels, which in this case happen to be Samudra Suraksha.

The accident that had happened acquired a huge proportion. The trouble with disasters is that they come without warning and the oil industry is known to be a very high risk industry.

A fortunate aspect of this disaster is that out of 355 employees at sea, 348 were rescued in no time, of course the death of 10 employees is no doubt tragic and there is a concern over fate of the other 11 who are still missing. But one striking aspect of the whole disaster is the contrasting manner in which it was managed.

Because of heavy rains and flooding in Mumbai there were serious difficulties in monitoring the rescue operation from the ground,. In fact ONGC's offices at Bandra – East were completely flooded and the company had difficulties initially in establishing even the control room.

3.7.3 The September 29, 1993 Killari Earthquake in Central Maharashtra

Most of the world seismicity is concentrated along the plate boundaries. However, a significant number of earthquakes, including some large and damaging ones, do occur within the plates. Our understanding of intracratonic semismogenesis and the hazard it entails is poor, in parts because data are scarce.

The 1993 Killari earthquake in central peninsular India is the latest intracratonic event to be responsible for a large disaster. The positive side of this tragedy is that it will provide new insights into geologic engineering and cultural factors that control the distribution and degree of damage, which will aid in turn the development of some more effective hazard reduction for peninsular India.

India report summaries our observations during a ten-day investigation of the 1993 Killari earthquake. Several aspects of the earthquake were investigated, ranging from the surface rupture and related deformation of the pattern of damage to engineered and traditional structures. Finally the rescue and reconstruction efforts following to earthquake hazard brought out important issues that are generally are briefly discussed.

In some building the traditional heavy clay roof was supported on a frame of wood posts and beams. In most cases, the timber columns continued to hold roof together while the walls

collapsed, generally outwards from the timber frame , saving the lives of many occupants.

Emergency Response

- The affected knows only natural disaster is drought. Hence, the earthquake took the people and administration by surprise. It took 2 to 4 days to effectively organize rescue and relief operations.
- Of all the villages devastated by the quake, only the village **Killari** had a wireless connection with the district police headquarters at Latur. Within minutes, the information about the devastation in Killari was conveyed to Latur and from there to the state headquarter at Mumbai.
- Immediately, about 20 policemen stationed at **Ausa** 28 km from Killari, rushed to Killari, followed by District Collector. About 50 policemen were also dispatched from Latur.
- Immediate search and rescue was conducted by the survivors and limited police rescue teams.
- As a day progressed, information about equally severe devastation from nearby villages started reaching Killari.
- By early morning i.e. 1st October, Indian army took the task of search and rescue.
- By the afternoon of the day of the earthquake, many curious onlookers had arrived in the area. This led to traffic jams and hampered the task of search and rescue.
- On October 2, entry to the affected area was controlled to allow entrance only to government personnel and members of volunteer organisations.
- The task of search and rescue became extremely difficult due to the heavy rains, which immediately followed the earthquake and the enormous quantities of the rubble. In places 2 to 3 m. of rubble has to be removed to extricate the bodies.
- The narrow village streets were choked by fallen rubble which further hampered rescue operations.

- Mass cremations that were held on the first two days after the earthquake were done without adequate record keeping. This led to confusion about the actual number of deaths.
- At one time, the newspapers reported up to 3000 dated. Later it was discovered that about 9000 fatalities actually occurred.

Recovery

Medical Aid - The number of injured in Maharashtra was about 15,500. About 50 mobile teams of doctors were working. About 125 beds in civil hospital at Latur had to convert in nearby school into hospital ward to care about 300 indoor patients. On the other hand, the rural medical college and hospital are **Ambe Jogai** which is 60 km. from Latur had 510 bed capacity.

Food and water - Cooked food was provided in the affected villages during the first fortnight by large number of voluntary agencies and the army. After 15 days the community kitchens were closed. Enough rations and other provisions to last a month were provided to the people, requiring them to cook their own foods.

After earthquake, water was trucked into the region. Generally reach village was assigned a truck. Drinking water was supplied regularly by water storage tanks which were donated by UNICEF/ CARE were used for storing water in villages.

Resettlement and Housing :-

A large number of villages which were totally destroyed are being relocated to places far away Every affected family will be provided a housing unit with a covered area of 20, 40 or 60 square meters and an open area of 15 to 45 square meters for animals shelters.

Communication :- An excellent communication network was set up after the earthquake. Initially, a number of HAM sets were called in.

In Latur, Solar powered satellite communication towards were installed in most of the bigger villages.

3.8 UNIT END QUESTIONS

1. Explain the extinction and state the threats to environment from extinction of plants.
2. Define the term habitat loss and discuss its impact.
3. Discuss Climate Change in detail.



DEALING WITH ENVIRONMENTAL CONCERNS - II

Unit Structure

- 4.0 Objectives
- 4.1 Introduction
- 4.2 Concept of disaster
- 4.3 Types of disaster
- 4.4 General effects of Natural Disasters
- 4.5 General effect of Hybrid disasters
- 4.6 Dealing with Disasters
- 4.7 Human Rights Issues in Addressing Disasters
- 4.8 Questions

4.0 OBJECTIVES

After studying the unit you will be able

To understand the concept and types of disaster

To be prepared to deal with disasters

To address human rights issues associated with disasters.

4.1 INTRODUCTION

The environment of our planet is very dynamic system. Number of natural processes of our environment proved to be dangerous to the living organisms. Some of the natural disasters like Earthquakes, Floods, Droughts have proved to be most destructive which might have killed thousands of people. In the last thirty years about 3 million people in the world have been killed by the above disasters. In addition to this unmeasureable losses like damage to property, social losses such as unemployment and decrease in property caused by such disasters.

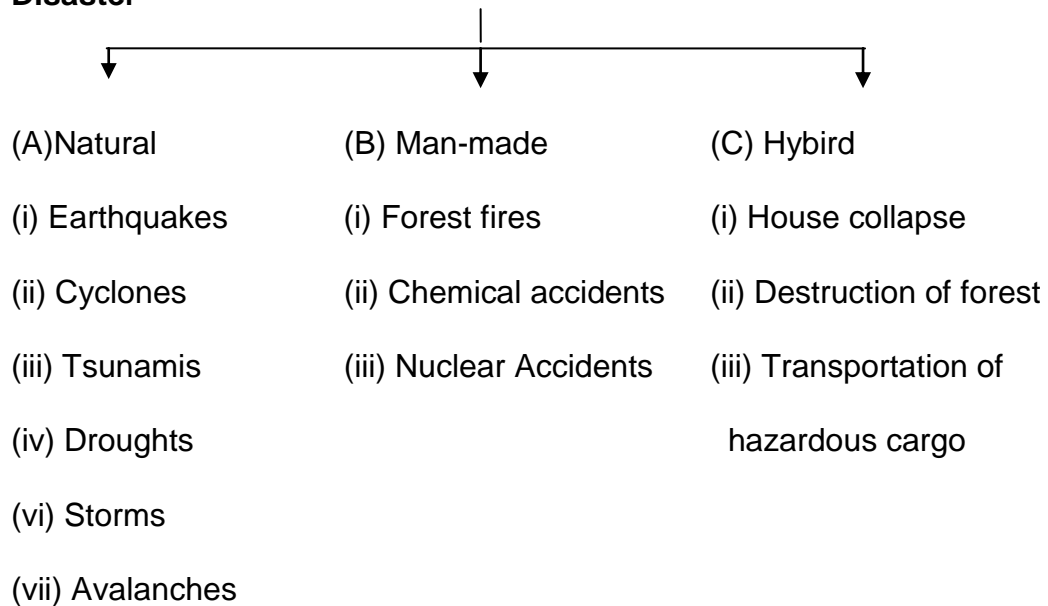
4.2 CONCEPT OF DISASTER

Disaster is an event that strikes suddenly and changes the lives of all that it touches. Internationally accepted definition of disaster is “An occurrence arising with little or no warning which threatens or causes serious disruption in life and death or injury to a very large number of people.....”. The most important and critical part of disaster is that its forces are largely beyond human control.

4.3 TYPES OF DISASTER

There are two types of disaster. They are as follows:-

Disaster



4.3.1 Natural Disasters :-

Natural Disaster are caused by natural phenomena for e.g. earthquakes, floods, cyclones droughts, etc. It is very difficult to predict these disasters.

4.3.2 Man-made Disasters :-

Generally result from human interaction within artificial environment which is created by him e.g. road accident, railway accident or accidents in industries, fires, etc.

4.3.3 Hybrid Disasters :-

When there is a link between manmade events and natural events it is known as hybrid disasters e.g. deforestation, landslides, droughts, etc.

Check your progress

Q.1 Briefly explain the concept and types of disasters.

4.4 GENERAL EFFECTS OF NATURAL DISASTERS

4.4.1 Earthquakes :-

Earthquake is a vibratory movement of the crust of the earth. Some of the effects of earthquake are as follows :-

- a) **Loss of human lives** :- Earthquakes are the most destructive natural disasters that have killed thousands and thousands of people in earthquake prone areas of the world . For e.g. On September 30th, 1993 at Latur in Maharashtra killed more than 7000 people, on January 26th, 2001 earthquake at Bhuj killed more than 19,00 people.
- b) **Economic Loss** :- Earthquake causes backward and forward or upward and downward violent ground movements accompanied with fracturing which leads to collapse of large number of buildings, dams, bridges, tunnels etc. In 1993 Latur earthquake in Maharashtra over 30,00 houses were destroyed. Similarly in Bhuj earthquakes 3.48 lakhs houses were destroyed and 8.44 lakhs houses were damaged between 1970 and 1990 earthquakes in different parts of the world caused overall economic losses which are estimated at \$ 65 billion.

4.4.2 Tsunami :-

Tsunami causes inundation of land and bring about massive losses to property and life low lying coastal areas which are most vulnerable to direct impact of Tsunami waves.

Some of the impact of Tsunami are as follows :-

- a) **Physical damage** :- Tsunami causes flooding in low lying coastal areas which generally affects human settlements by damaging large numbers and other infrastructures like roads, bridges etc. Shipping boats, port facilities, fishing nets etc also get damaged.
- b) **Public Casualties and health** :- Since Tsunami attacks the sea-shore like a water bomb many people are washed out to sea crushed by grand waves which causes deaths and/ or injuries.

Sometimes Tsunami causes damage to pipelines of drinking water which causes shortage of drinking water. Even wells and ground water may become unfit due to contamination of salt water and debris. Such contamination leads to spread of number of water borne diseases like dysentery and diarrhea.

- c) **Loss of Agricultural Crops** :- Due to flooding by Tsunami in coastal areas there may be damage to the standing crops and shortage of food supplies. Even agricultural land may render unfit due to salt water from the sea.

4.4.3 Floods :-

Due to heavy rain in the river basin the river inundates and there is a wide spread of water on the sides of river channel. This phenomena is known as flood.

Some of the effects of floods are follows :-

- a) **Loss of lives and property** :- In many Afro-Asian countries major floods kill thousands of people every year. More than 75 % of the total deaths from floods occur in India, Bangladesh, China, and Pakistan. In 2005 large area of Metropolitan city- Mumbai which recorded 944 mm rainfall in 24 hours at least 1,000 people died due to flooding.
- b) **Threat to public health** :- Flood water causes contamination of drinking water which is responsible for spread of number of water borne diseases like dysentery, diarrhea, leptospirosis etc.
- c) **Economic effects** :- Economic cost of floods is unprecedented which arrest the entire commercial trading due to disruption in transport and communication facilities. It

also causes damage to agriculture, animals, human lives, shelter, bridges etc.

4.4.4 Droughts :-

Drought is a climatic anomaly characterized by deficit supply from normal rainfall, erratic nature of rainfall distribution, higher water need or combination of all the above factors. Frequent drought have drawn the attention of planners, scientists & society.

Some of the effects of drought are as follows :-

a) **Loss of Agriculture** :- Shortage of water from rainfall results in major impact on agriculture with increased intensity or extended duration of drought prevalence. In drought prone areas there is a significant fall in food production which leads to short supply of food, starvation and undernourishment.

b) **Other effects** :-

- Non-availability of drinking water
- Land degradation
- Fall in investment capacity of farmers
- Rise in food prices
- Loss of biomass
- Death of animals and
- Forced migration of people from drought areas to units.

4.4.5 Cyclones :-

A cyclonic storm is an intense whirl in the atmosphere with very strong wind which is most destructive and dangerous atmospheric phenomena Indian sub-continent is a worst cyclone affected area.

Some of the effects of cyclone are as follows : -

a) **On coastal areas** : A strong wind in cyclone generate surges in sea water. A strong surge is an abnormal rise of sea level near the coast caused by severe cyclonic storms as a result sea-water inundates low lying coastal areas as damaging houses, eroding beaches, destroying vegetation, reducing soil fertility. There is a heavy loss of human lives and live stock due to strong wind and flooding.

- b) Social and Economic effects :** Heavy & prolonged rains due to cyclone cause floods and submergence of low lying areas, pollute drinking water sources from dead animals and rotting food causing outbreak of epidemics like gastro.

Strong wind and heavy rain disrupts road and rail transport facilities by flood waters, uprooted trees and electric poles.

Check your progress

- Q.1 What are the effects of Earthquakes & Tsunami ?
- Q.2 Explain the concept of flood.
- Q.3 What are the effects of floods ?
- Q.4 Explain the term Drought.
- Q.5 Explain the effects of Drought.
- Q.6 Explain the term cyclone
- Q.7 Explain the effects of cyclones.

4.5 GENERAL EFFECTS OF NATURAL DISASTERS

Nuclear Accidents, Forest Fire, Accidents in Industries, roads and railways etc are man-made disasters.

4.5.1 Nuclear Accidents :

Use of radio isotopes in research, medical facilities, industries and atomic power stations is responsible for significant number of casualties from exposure to radiation. Other sources of radiations are water released from nuclear power station and nuclear explosion.

Some of the effects of Nuclear Accidents are as follows:

- a) Nuclear Accidents are responsible for majority of deaths.
- b) Exposure to ultra violet (UV) radiation increases risk to cataract and skin cancer.

4.5.2 Forest fires

Forest fires are caused by natural factors such as lightning or by human factors due to negligence, accidents or careless burning of forest. Poor management of forest is also responsible for forest fire in densely forested areas. Every year thousands of fires occur in Himalayan and Mediterranean forest region. In 1982 a single forest fire at Kalimantan, Indonesia destroyed nearly 3.5 million hectares of forest.

Some of the effects of forest fires on man and animal are as follows:

- a) Loss of human life.
- b) Loss of animal life.
- c) Loss of shelter for birds & animals.
- d) Economic loss due to fire to valuable forest.
- e) Economic loss of rare plants & animals species which leads to loss of bio-diversity.
- f) Air pollution.

4.5.3 Industrial Accidents :

Day by day use of different chemicals in our daily life as artificial sweeteners flavoring & coloring agents, packed foods & milks, detergents, cosmetic is increasing and therefore, chemical industries too. Today more than 50,000 chemicals are used in different products. Some of which are toxic substances may cause allergies, damage externally vital organs of human body like eyes, brain, liver, kidney and reproduction organs.

Some of the other impacts of accidents in chemicals industries are as follows :

- a) Breathing of toxic chemicals leads to respiratory problems.

- b) Exposure to some chemicals suppresses immunity.
- c) Corrosive Industrial chemical irritate or break the skin.
- d) Air, Water & Soil pollution takes place when toxic untreated chemicals are released directly from chemical industries.

Check your progress

Q.1 What are the causes & effects of forest fires ?

Q.2 What are the effects of disaster in chemical industries?

4.6 GENERAL EFFECT OF HYBRID DISASTERS

4.6.1 Destruction of forest.

Very large scale destruction of forest all over the world for various purposes on. Everyday about 90 areas forest land is cleared by man for agricultural expansion, commercial farming, increasing demand for fire wood, increasing urbanization & industrialization, increasing demand for wood products like paper and furniture's industry.

Some of the effects of forest destruction are as follows :

- a) Forest destruction leads to floods, droughts, climatic changes and soil erosion.
- b) Loss of habitat of birds and animals
- c) Loss of genetic diversity which can provide food and medicines.

4.6.2 Oil spill :

Oil spill is nothing but release of liquid petroleum into marine water due to human activities such as fishing, shipping off- shore oil drilling etc.

Some of the effects of oil spill are as follows :

- a) Oil spills may cause death of many seabirds and mammals by entering it in their lungs and liver. It causes hormonal alterations. It reduces foraging ability and causes dehydration and metabolic imbalance in marine birds & mammals.
- b) Oil spill affects food chain in the marine ecosystem causing pollution of marine water.

Check your progress

- Q.1. What are the effects of destruction of forest ?
- Q.2. Define the term oil spill. What are the sources & oil spills ?
- Q.3. What are the effects of oil spill ?

4.6 DEALING WITH DISASTERS

4.6.1 Introduction :

Disasters cause tremendous destruction, loss of human lives and produces negative impact on national economies in different parts of the world. Therefore, prevention, mitigation and disaster preparedness become very important in disaster management.

Development of technology has helped us for better understanding of different types of disaster. Therefore, is has become possible to develop a system of better management of different disasters. The role of scientist and government has become most important while dealing with disasters.

4.6.2 Disaster Mitigation.

Disaster mitigation refers to measures taken well in advance of a disaster event to reduce, if not prevent the impact of disasters. In disaster mitigation efforts made to reduce human suffering and loss of property. It includes awareness programmes, scientific land

use planning and infrastructure. Any investment in disaster mitigation plans saves economic losses and social recovery cost.

4.6.2.1 Goals of Disaster Mitigation :-

a) Generating Awareness :

It includes education about disasters through providing information and materials to reduce personal injury, damage to property and disruption of society.

b) Mobilization :

At the time of facing disaster support and co-ordination of different agencies like government, voluntary organisations, emergency management offices and insurance companies is very essential.

c) Mitigation Activities :

In order to face any disaster confidently it is necessary to incorporate existing disaster mitigation activities into routine planning, preparedness, planning and relief operation activities and collection of data.

4.6.2.2 Mitigation & Management of disaster : -

a) Earthquakes and Tsunamis

i) Measures to reduce risk :

- Public Awareness Programmes and Training to local as well as government servants.
- Assessment to reduce structural vulnerability
- Insurance
- Control of land use or zoning building codes

ii) Preparedness

- Development of Tsunami & Earthquake warning system
- Assessment of preparedness programmes

- Fixing instrument like seismogram and deep ocean assessment and reporting of Tsunami

b) Post Earthquakes and Tsunamis

- Starting rescue operation during & after earthquake and tsunami
- Supply of water & food
- Distribution of emergency medical assistance
- Survey on damage & needs
- Reconstruction & rehabilitation of affected people

c) Floods :

Measures to reduce risk

- Construction of dams, canals, dykes etc
- Afforestation/ plantation of trees in catchment area of the river to reduce surface run off.

d) Preparedness :

- Detection of floods and warning system
- Training to NGO's and government officials for rescue operation
- Development of proper plan for flood plain management

e) Post flood Management :

- Start rescue and search operations immediately
- Assessment of loss of property and lives
- Supply of drinking water & food to the affected people
- Construction of temporary shelter
- Arrangement of vaccination programme to control water borne diseases like jaundice, diarrhea and cholera.

f) Droughts :**Measures to reduce risk**

- Development of early warning system for drought & famine

g) Preparedness :

- Development of drought response plan
- Rain water harvesting
- Recycling of water
- Regulating use of water in agriculture & industries
- Cloud seeding i.e. an artificial technique to induce rainfall
- Afforestation

h) Post Drought :

- Development of proper food distribution system
- Special programme for protecting livestock
- Measures to maintain food security
- Stabilisation of prices of essential commodities like food
- Rehabilitation & health programme for drought affected people

i) Cyclones :**Measures to reduce risk pre-disaster**

- Planting trees along the coast which will break the intensity of wind
- Construction of embankments along the coast to control submergence of coastal area
- Construction of storm shelter

- Development of proper drainage system to drain excess water of heavy rain
- Development of radio/ siren system to give early warning of the cyclone
- Proper mapping of path of cyclonic storm
- Proper training of NGO's and government officials

j) Post Cyclone

- Start rescue operations immediately
- Provide emergency medical facility
- Conduct a survey to measure damage and needs of the affected people
- Arrangement of food & drinking water supply
- Arrangement of temporary shelter
- Manmade disaster
- Nuclear Accident
- Risk Reduction
- Development of plans to create awareness
- Preparedness for emergency at local level where nuclear plant is located
- Inform people about hazardous installation and aid with the help of technical persons

k) Preparedness

- Identification of hazardous material
- Inspection of storage facilities for radioactive elements
- Monitoring radio activity around nuclear plant
- Development of warning system in case of nuclear accident
- Practicing evacuation plan

l) Post disaster

- Immediate shifting of people from affected area
- Starting rescue operation
- Making available for alternate sources of drinking water
- Clean up programmes of radioactive waste
- Monitoring environment impact on local & regional level

m) Industrial Accident**Risk reduction measures**

- Analysis of chemicals used in different chemical industries and identify their different potential hazards.
- Work place be less crowded to avoid biological hazards
- Provide plenty of shower facilities in case of chemical hazard.
- Provide locker room at the place of work where workers can change clothes indoor to avoid spreading of toxic likely to take home

n) Post Accident disaster

- Substitute the hazardous chemical with the other chemicals and advance technology

Process involved in production must be assessed for risk in order to set controls whenever necessary.

Check your progress

- Q.1 What is disaster mitigation ?
- Q.2 Briefly explain the different goals of disaster mitigation ?
- Q.3 Suggest various measures to be taken before, during & after earthquakes & tsunamis ?

- Q.4 Suggest various measures to be taken before, during & after Floods ?
- Q.5 Suggest various measures to be taken before, during & after droughts ?
- Q.6 Suggest various measures to be taken before, during & after Cyclones?
- Q.7 Suggest various measures to be taken before, during & after nuclear accidents?
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4.7 HUMAN RIGHTS ISSUES IN ADDRESSING DISASTERS

4.7.1 Introduction

Disasters –man-made or otherwise – cause severe negative effects on those who are affected by them. There is loss to property and even life in many cases. As we have seen in earlier Chapters, Indian people can potentially face a variety of disasters, due to the vastness of the land and diverse geographical and climatic profiles. Added to the disasters caused by nature, there are several possibilities of man-made disasters, due to many reasons. Our country has witnessed several disasters, in the recent past.

However, Indian government responded very late to the problem of disasters, in a concerted manner. Earlier, government's response used to be reactionary, i.e. after disaster has taken place. In the past decade or so, there is realization that disaster preparedness is essential. Accordingly, the National Disaster Management Act was enacted in 2006. The government adopted the National Policy on Disaster Management in 2009.

4.7.2 Government's long-term measures

- a) **National Disaster Management Act, 2006** : The Act lays down institutional, legal, financial and coordination mechanisms at the National, State, District and Local Levels. These institutions are not parallel structures independent of each other and will work in close harmony. The new institutional framework is expected to usher in a paradigm shift in disaster management from relief-centric approach to a proactive, prevention and mitigation.
- b) **National Disaster Management Authority** : the Act empowers the Central Government to appoint the National Disaster Management Authority with the Prime Minister of India as the Chairperson and such number of other members, not exceeding nine. The National Authority has the responsibility to lay down., approve the policies, plans and guidelines for disaster management prepared by various departments of Government of India to ensure timely and effective response to disaster.
- c) **National Executive Committee** : To assist the National Authority an **advisory committee** called the National Executive Committee consisting of experts in the field of disaster management having practical experience of disaster management at the National, State and District level. The Committee is entrusted to prepare a national plan for disaster management which is to be reviewed and updated annually.
- d) **National Plan** : The National Plan shall include the prevention of disasters, the integration of migration measures in the development plans, the preparedness and capacity building to effectively respond to any threatening disaster situations or disaster, the roles and responsibilities of different Ministries or Departments of the Government of India.

The National Authority is to recommend guidelines for the **minimum standard of relief** to be provided to persons affected by disaster like

- i minimum requirements to be provided in the relief camps in relation to shelter, food, drinking water,

- ii medical cover and sanitation,
- iii special provisions to be made for widows and orphans,
- iv ex gratia assistance on account of loss of life as also assistance on account of damage to houses and for restoration of means of livelihood and
- v such other relief as may be necessary.

In case of disaster of severe magnitude, the National Authority may recommend relief in **repayment of loans** or for **grant of fresh loans** to the persons affected by disaster on such concessional terms as may be appropriate.

e) Other authorities : The act provides for the establishment of authorities at the State and District levels with powers and duties similar to that of national bodies assigned to them. They are : -

- i State Disaster Management Authority
- ii State Executive Committee
- iii District Disaster Management Authority

The act also envisages the establishment of **National Institute of Disaster Management and National Disaster Response Force** and the creation of **National Disaster Response Fund**.

f) National Policy on Disaster Management, 2009 : In the light of the provisions of the Act, the Central government adopted the National Policy on Disaster Management in 2009. The **Objective** of the National Policy on Disaster management are :

- i Promoting a culture of prevention, preparedness and resilience at all levels through knowledge, innovation and education.
- ii Encouraging mitigation measures based on technology, traditional wisdom and environmental sustainability.
- iii Mainstreaming disaster management into the development planning process.

- iv Establishing institutional and techno-legal frameworks to create an enabling regulatory environment and compliance regime.
- v Ensuring efficient mechanism for identification, assessment and monitoring of disaster risks.
- vi Developing contemporary forecasting and early warning systems backed by responsive and fail-safe communication with information technology support.
- vii Ensuring efficient response and relief with a caring approach towards the needs of the vulnerable sections of the society.
- viii Undertaking reconstruction as an opportunity to build disaster resilient structures and habitat for ensuring safer living.
- ix Promoting a productive and partnership with the media for disaster management.

4.7.3 Examples of poor treatment of the victims of disaster

Following are just a few examples of how the victims of disaster were treated. They underscore the need for drastic improvement in the approach towards rescue, relief, resettlement and rehabilitation of people affected by disaster.

a) The Bhopal Gas Disaster in 1984

- i Over five lakh genuine victims had been deprived of compensation on the basis of fraudulent medical categorization of victims.
- ii There was inordinate delay in deciding and giving cash compensation.

b) Cyclone in Odisha in 1999

- i The indifferent attitude of the administration was the main problem. Of 7.5 lakh families whose houses were completely damaged, more than five lakh were below the poverty line, but only 1.5 lakh houses were to be built.
- ii The government failed to fulfill even a single promise made to the cyclone-affected. For example, the official toll in the cyclone was 10,000, but only about 500 people were paid a

compensation of Rs. 10,000 within the promised hundred days.

- iii The government had announced that it would complete 50,00 hoses before the monsoon in 2000. However, not one was ready. People had to face the monsoon without a roof over their heads. Coastal Odisha was hoping for better treatment from the government.

c) Tsunami in 2004

- i In a number of tsunami affected areas, the bodies of the Dalits killed by the waves had to be removed only with the help of the sanitary workers brought from far way places as the members of the fishers community were not willing to help disposing of these bodies.
- ii Tamil Nadu Government has already evicted around 1500 families from Dideer Nagar slum, which is close to Marina Beech in Chennai. The families that had own houses before tsunami were given houses in a place 20 km. away from Dideer Nagar. Those who were living in rented houses before tsunami were not given alternate houses for settlement. They continued to live either in dilapidated houses in open air in the same slum. The place chosen for their resettlement had to drinking water, transport, electricity, toilet and school facilities.
- iii Even after two months since tsunami devastated the coastal districts, the displaced people were in relief centres. They looked forward to the charity groups for food and other basic needs and like water.

4.7.4 General Observations

Following general observation can be made with regard to human rights issues in addressing disasters:

a) Recognition and quantification of loss :

After disaster takes place, it is necessary that government officials recognize the loss and quickly quantify it. This will help government to decide the quantum of compensation required to be given. This, however, does not happen. Moreover, the victims of disaster are not taken into

confidence while deciding the nature and quantum of compensations.

- b) **Discrepancies in response to disaster** : Although the National Disaster management Policy is now in place, there is no common approach adopted across the country in responding to disasters. This results in unequal treatment and compensation given to the victims.
- c) **Show and inadequate response** : Quick and able response to disaster-affected areas and people is the key to minimize losses. However, government's Rigid rules,, procedures, lack of coordination, lack of decision making authority often affect government's response adversely.
- d) **Compensation** : Disasters sometimes causes huge and irreparable loss to property and human life. Although the government provides some compensation to the victims, it is usually inadequate. Moreover, it come very late, in most cases. The victims of the Bhopal Gas Leak, which happened in 1984, have not yet received full compensation.
- e) **Insensitivities** : it is observed that a large percentage of government officials treat disaster victims in an insensitive manner. They are not ready to look at the plight of the victims sympathetically.
- f) **Involuntary displacement** : On several occasions, victims of disasters have to leave their place of residence and occupation, occasions, victims of disasters have to leave their place of residence and occupation, causing server economic loss for the long term. For example, several families residing closer to the sea shore in Chennai had to be relocated after the Tsunami in 2004.
- g) **Unequal and insensitive rehabilitation policy:** Rehabilitation of disaster victims is probably the weakest in India. Rehabilitation takes place in an haphazard manner, or does not take place at all.
- h) **No participation of victims** : Disaster victims are not taken into confidence while deciding their rehabilitation. They are also not provided with factual information about rehabilitation plans.

- i) **Lack of coordination** : There is lack of coordination among government departments, when it comes to providing relief and rehabilitation to disaster victims. Since several government agencies are involved in rehabilitation programme, victims have to run from pillar to post for getting their dues.

4.8 UNIT END QUESTIONS

1. Explain the concept of disaster and classify the different types of disasters?
2. Explain the general effects of Natural disasters.
3. Explain the general effects of Hybrid disasters.
4. What is disaster mitigation? State the goals of disaster mitigation.
5. State the government long term measures in addressing disasters.
6. Write briefly on the National Disaster Management Act, 2006?
7. What are the objectives of the National Disaster Management Policy 2009 ?
8. Give example of Disasters with poor response by the Government ?
9. What general observations could be made regarding the rights of Disasters victims ?



5

SCIENCE AND TECHNOLOGY I

A. NATURE AND DEVELOPMENT OF SCIENCE

Unit Structure:-

- 5.0 Objectives
- 5.1 Introduction
- 5.2 Nature of Science
- 5.3 Development of Science
- 5.4 Summary
- 5.5 Unit End Questions

5.0 OBJECTIVES

1. To understand the meaning and important features of science
2. To analyze science as empirical, theoretical, practical and validated knowledge
3. To trace the development of science from the early ages to modern times

5.1 INTRODUCTION

Science is one of the most important aspects of human life. It is a broad field which studies various subjects from nature to machines. Science has led to better understanding of the world and is making human life much better. As man's curiosity and needs grew, his knowledge also grew. Science thus began from simple inventions and later developed into complex theories.

5.2 NATURE OF SCIENCE

Science has given solutions of many problems of man. It is a process to understand natural phenomena. Scientific knowledge is continuously increasing. To know what qualifies a certain study as a science we need to understand the meaning and characteristics of science

5.2.1 Meaning

The word science is derived from the word *scientia* meaning knowledge. Thus any body of knowledge can be termed as science.

It is a systematic study of knowledge based on reasoning, observation and experimentation. It can be defined as, an organized knowledge especially when obtained by observation and testing of facts about the physical world, natural laws and society.

Science is a way of discovering what is in the universe and how those things work today, how they worked in the past, and how they are likely to work in the future. The above definition states that science aims at acquiring factual information and presenting it in structural form. Thus the smallest atom, the universe, anatomies of living beings and even their social lives become a part of scientific study.

5.2.2 Principles and characteristics

There are certain basic principles that make science unique. Following are some of the essential characteristics of science.

a. Scientific method

Science studies various phenomena using the scientific method. This method is systematic process of finding relevant data, forming hypothesis, analyzing its validity and conducting experiments. It is a gradual process. At the end scientists end up with new facts, theories and inventions. Answers to questions are found based on reasoning and accurate data.

b. Observation and inference.

Scientific data is gathered through observation and studied through inferences. Observations are made through five senses often supported by technology. Based on the observations logical interpretations are derived. For example the earliest model of planetary systems was prepared on the basis of continuous observation of the sky over a long period using simple tools.

c. Objectivity

Science is based on facts. It depends upon observation and logic. It is not concerned with the personal beliefs, opinions and prejudices of the people conducting the study. The facts of science and results of its experiments are therefore objective. They do not change from person to person. It is unbiased and factual.

d. Universal basic ideas

Science assumes that the universe is a system in which basic rules apply everywhere. Laws developed by science are thus universally applicable such as the law of motion or magnetism. Scientific experiments can be thus inducted in any one part of the universe to understand the working of the entire system.

e. Tentative

New hypotheses sometimes challenge well established facts. Even with strong evidence it is not possible to prove that a certain law will be true in every condition. Sometimes new experiments improve earlier facts and theories. Thus scientific knowledge is tentative. For example, the earlier theory that earth is the centre of the system was later proved wrong by Copernicus who showed that sun is the centre and earth revolves around it. Science is thus improvising continuously.

f. Precise and durable knowledge

Since scientific knowledge is based on rigorous experiment it is precise and reliable. Scientific knowledge is expressed in clear language to avoid ambiguity. Once scientific ideas are established as facts they remain unchanged for a long time. Several ideas are consistent facts such as gravitational force and facts relating to energy and matter.

g. Creative thinking

Creativity and imagination are the roots of scientific ideas. Scientists use creative, never-before-used methods to conduct their experiments. They are inspired to stretch the limits of their imagination and bring it to reality.

h. Laws and theories are different

Scientific laws and theories are related to each other. However they are not the same. Both are based on hypotheses and supported by empirical data. Laws are established facts that explain the relationship between various factors and explain patterns of systems under particular conditions. They are descriptive and mathematical.

Theories on the other hand provide explanation to established facts. They are non mathematical and give answers to how a certain system works. Theories are interpretations of laws. A few theories become laws while some theories lead to discovery of new facts. For e.g. Ptolemy's theory on planetary systems led to almost accurate prediction of position of planets.

i. Science has limitations

Science predicts and explains phenomena. However it cannot solve all problems with complete accuracy. For example there are a few diseases which are not curable today.

Thus, Science is a subject that describes, finds solutions, prepares models and provides explanations to natural phenomena. It is based on empirical data.

5.2.3 Science as knowledge

As a body of knowledge science has the following aims:

a. Empirical

Empirical knowledge means knowledge gathered through sensory experience, i. e. through touch, sight, sound, taste or smell. In science, all hypotheses and theories are tested against observations of the natural world. Along with reasoning experience is given importance. Evidence derived from experiments become basis for knowledge. For example, Aristotle one of the earliest philosophers said that knowledge of the natural world is based on its perception and thoughts based on what is experienced.

The empirical data can be subjected to bias of the scientists. Verification of scientific data can help to avoid bias of the investigator. Thus scientific knowledge is validated.

b. Theoretical

Construction of useful theories is a major goal of science. A scientist formulates a hypothesis means a calculated conclusion which he wants to prove right. To do this he conducts experiments and observes facts. The result of this process is a theory. A scientific theory can be proved wrong by testing it under various conditions. As new ideas develop and new evidences are found, theories improve accordingly. No theory is at any time completely proven, except in mathematics. Wrong theories are modified or completely discarded. For e.g. the planetary theory of Ptolemy remained true for around 1000 years till Copernicus gave his heliocentric theory. However, Newton's theory of gravitation, Darwin's theory of evolution is self consistent. Scientists conduct research to verify theories, check their validity or sometimes to improve them.

The theories should be able to predict. On the basis of existing theories new discoveries and experiments should be made.

c. Practical

Practical knowledge of science refers to the application of scientific knowledge. Basic theoretical research is required for further technical research. Through application of scientific knowledge man has found solutions to several problems, increased efficiency of human life and has made many useful thing. The application of studies in molecular biology, genetics and anatomical

research has opened many new areas in medicine. Knowledge of space and astronomy has encouraged man to dream of exploiting resources from other planets for use on earth. Sciences such as psychology and neuroscience aim at understanding human thinking but there are practical motives such as treatment of mental illness.

Check your progress

Q.1. Discuss the meaning and nature of Science.

Q.2. Explain the various characteristics of Science.

5.3 DEVELOPMENT OF SCIENCE

Science as a body of knowledge developed along with man's understanding of nature. All things that man did for survival are a part of the story of growth of science. Development of science can be studied in the following stages:

5.3.1. Development of Science in the Ancient cultures:

Ancient period of history of man dates back to more than one million years ago. The ancient man was completely dependent on nature for survival. He observed nature and devised simple ways to explain it. He made several attempts at experimenting on the basis of his observation.

a) Stone age

During the early Stone Age, man was completely dependent on what was available in nature. He experimented with resources for food, shelter and clothing. Simple tools of stone, the discovery of fire, clothes of animal skin are some of the discoveries he made using his knowledge of nature. He also formed simple social and religious institutions. Though writing was not known to him, the various cave paintings belonging to this period discovered all over the world show his inclination towards culture. These painting might have also been means of communication.

When man experimented with creating his own resources by manipulating nature, the New Stone Age began. This shows that by this time he had accumulated lots of knowledge of nature. In the absence of writing, this knowledge was communicated orally through generations. By understanding season cycle and use of water he invented agriculture around 9000 years ago. He also

domesticated animals. During this stage man's relationship with nature changed. He became less dependent on nature.

b) Civilization stage

In around 3500 BC, man developed civilization. A new urban society in which agriculture was developed, writing was invented, trade and commerce flourished. Development of writing is one of the biggest milestones of human kind history. It enabled man to store knowledge. Early form of writing was in symbols. Several inscriptions from the Egyptian and Mesopotamian (ancient Iraq) civilizations give us knowledge about life during that period. Arts and science was developing during these civilizations.

The Sumerians of Iraq have contributed to modern science with their numerical data. For e. g. the number system based on 60 is basis for 360 degree circle. Astronomical periods identified by them are still widely used in lunar calendars. Babylonian astronomy was the first attempt at refined mathematical description of astronomical phenomena. Ancient Egypt made significant developments in astronomy, medicine and mathematics.

5.3.2 Development of Science in the classical age:

The Classical age is a period spanning over 1000 years from the 8th century BC to around 6th Century AD. It is the age of cultural advancement of the Greek and Roman civilizations. Philosophers during this period developed such knowledge in science that became basic foundations for later scientific study. The art of Classical Greece began the trend towards a more naturalistic depiction of the world, thus reflecting a shift in philosophy from the abstract and supernatural to more immediate earthly concerns. Philosophers stopped merely "suggesting" the human form and began "describing" it with accuracy.

Thales (7th c BC) is considered as the *Father of Science*. He was the first to state that movement of earth and earthquake were geological phenomena and not works of gods. **Pythagoras** (6th C BC) founded school of mathematics, while **Euclid** (3rd C BC) devised axioms, theorems and proofs in mathematics. Mathematical devices of both are still considered basics foundations in geometry. **Aristarchus** (2nd C BC) was the first to propose a heliocentric model of solar system, i. e. the sun was at the centre and the earth revolved around it. **Eratosthenes** calculated approximate accurate circumference of the earth.

Hippocrates, the father of Medicine, and his associates were the first to describe many diseases and medical conditions. **Herophilos** described the nervous system.

Leucippus and his student **Democritus** introduced the theory that all matter is made of indivisible units called atoms.

Plato and **Aristotle** gave philosophical explanations to natural phenomena. They also made important contributions to biological sciences.

With the spread of the Greek empire, scientific knowledge also spread in Egypt. Greek became the primary language of Science. Schools of science were established in Alexandria in Egypt. Later Greek works were translated into Latin by Roman philosophers.

Many scientists during this period were pioneers in their field. It was such path breaking knowledge that made this period “classical” for later generations.

5.3.3 Development of Science in the Middle Ages:

The period between the classical ages and European Renaissance is referred to as the Middle Ages. It marked both the decline of scientific advancement and also later its revival. The middle ages are studied in three parts; early, high and later.

a) Early Middle ages (476-1000 AD)

Following the decline of Roman Empire, economic and cultural deterioration began in Europe. The knowledge of Greek declined, and scholars had limited original work to study from. By the early 5th century Christianity had spread in Europe on a large scale.

There was rise of monasticism. Surviving manuscripts of Roman classics were copied in monasteries. These served as sources for study to philosophers. However, very less original work was produced. By the 6th century monasteries became centers of teaching and learning. Bible became the centre of study; even if nature was studied it was for practical purposes for e. g study of astronomy to calculate the day of Easter. It was not done for theoretical study.

Under the rule of Charlemagne in Italy, sciences were encouraged. He introduced several educational reforms and brought about Cultural Revolution. Due to the transformations he brought about, his rule is known as the period of Carolingian Renaissance. He set up new schools throughout his empire. Some experts believe that the scientific study during Charlemagne’s rule was not original, but based on researches on ancient Roman texts. Because of lack of original scientific contribution and also loss of several ancient works, this period is called the **Dark Ages**. During the dark ages many arts were lost and science suffered major decline.

b) High Middle Ages (1000-1300 A.D.)

From the 11th century onwards, innovation again got impetus. There were new scientific discoveries. The European scholars during this period were influenced not only by classic Greek works but also by Arabic texts. They translated these ancient classics into Latin and started improving the knowledge base. Inventions such as the windmills and magnetic compass advanced agriculture and trade. The introduction of papermaking by the Chinese transformed the way knowledge was stored and circulated.

During this period many new universities were established. This gave institutional support and encouragement to scientific studies. Eminent scholars like Albertus Magnus, Roger Bacon researched old theories of empiricism and developed it to a new level. They proposed the study of nature based on reason and logic.

The period witnessed the development of new form of art. The Gothic style of architecture was introduced and used on a large scale for churches.

c) Late middle ages (1300-1450 A.D.)

The most important development during this period was the separation of science from theology and philosophy. Scientific works of the Byzantine and Islamic empire influenced the Europeans during this period. Science was no more joined with religious understanding. The most lasting and strong foundation theories were given by William Occam (14th century). Today it is known as Occam's razor. Its simple explanation means "*when you have two competing theories that make exactly the same predictions, the simpler one is the better*". It was later on utilized by Newton and Einstein.

Thus the middle ages were not dark throughout. There were several scientific advances. However by the end of the 15th century, Europe was affected by the Black Plague. It not only led to huge loss of population but also a setback to the interest in science. During this period science was largely associated with religion.

Check your progress

Q.1. Which were the important features of the Classical age?

Q.2. Why are the Middle Ages known as dark Ages?

5.3.4 Development in the Renaissance (1450- 1650)

The modern period in European history was ushered in the 15th century by the Renaissance. The term renaissance means rebirth in Italian. It was a cultural movement that brought new thought and discoveries. After the rise of the Ottoman Empire in the mid 15th century, scholars from Turkey moved to Europe with ancient and medieval classics. The rediscovery of classics by the Europeans led to the reintroduction of reason and emphasis on human emotions and ideas. The invention of printing press by Johan Gutenberg in 1436, ideas spread rapidly. With its centre in Italy, Renaissance gradually spread towards north Europe by the 16th century.

The scholars and philosophers during this period rejected medieval idea of god being the central idea for nature and art. They developed new theories which rejected the classical theories.

Nicolas Copernicus developed a more detailed and accurate heliocentric theory of the planetary system. His book explaining the revolution of earth and other heavenly bodies revolving around the sun was banned by the church, since it believed in the geocentric theory. He also made theoretical studies in mathematics.

Johan Kepler was a strong follower of Copernicus's theory. He studied it and added the fact that planets revolve around the sun in ellipse and not complete circles. His contribution is the famous Three Laws of planetary motion.

Galileo Galilee was the man of true renaissance spirit. He was not only an astronomer, but also a physicist, mathematician and philosopher. His first scientific discovery was the law of pendulum. He later successfully developed several devices like magnet, compass, thermometer, microscope etc. His breakthrough discovery was however, the use of telescope for observation of space. He is known as the father of Modern physics as he developed the law of falling bodies.

Francis Bacon argued that truth required evidence from the real world. He devised the inductive method for study of nature. He stated that scientist's should frame axioms or simple statement and prove them through the process of experimentation and analysis.

Apart from astronomy and mathematics, study of human anatomy was also developing very differently from the classics. While **Andreas Vesalius** laid the foundations of modern medicine and anatomical studies, **William Harvey** described blood circulation.

Leonardo da Vinci is known as the Renaissance man. He was a scientist, mathematician, philosopher, architect and painter. He wrote and drew on subjects including geology, anatomy, flight, gravity and optics, often flitting from subject to subject on a single page, and writing in left-handed mirror script. He made proto types of the bicycle, airplane, helicopter, and parachute.

Renaissance was thus a period of new ideas and growth of scientific knowledge.

5.3.5 The Age of reason and enlightenment (1650-1800)

The new ideas of reason and independent understanding of nature were carried forward strongly in the late 17th century. Scholars emphasized the right of individuals to think and express themselves freely. During Renaissance the church opposed scientific theories of Copernicus and Galileo. Such opposition of church and domination of the monarchy was rejected during this period. This led to the scientific revolution.

The Age of Enlightenment succeeding the Age of Reason was the period of further scientific advancement. Reason was to be the basis of authority and belief. Science was looked as a study of nature with the aim of developing humanity and achieving advanced progress. Intellectuals or *Philosophers* based their arguments against any authority on the basis of logic. Thus in social and political field also there was rejection of tyranny and tradition.

John Locke is considered as the father of Classical Liberalism. Locke argued that human nature was changeable and that knowledge was gained through accumulated experience rather than by accessing some sort of outside truth. His thoughts greatly influenced political philosophy all over the world.

Issac Newton is considered the greatest figure of scientific revolution. He was a physicist, astronomer, mathematician and also a theologian. He gave the theory of gravitation. He made significant contributions to the fields of optics and mechanics.

Several universities and institutes of scientific studies were set up all over the world during the scientific age. This encouraged scientific research.

In the 19th century further advances were made in astronomy, new planets were discovered and phenomenon like dark stars and star creation were studied. Medicine progressed with better understanding of human body and diseases. Cure to several medicines started being discovered, the very earliest being the discovery of vaccination for small pox by Louis Pasteur. One of the milestones of scientific theories of the 19th century was Charles

Darwin's Theory of Evolution which described the evolution of life on earth and led to the foundation of modern biology.

5.4 SUMMARY

Science is the study of every living and non living phenomenon that surrounds man. It is a process to understand and develop theories based on accumulated knowledge. Scientific knowledge is verifiable, changing and practical.

The body of scientific knowledge has been increasing since man's struggle for survival began. It developed through various stages. During the ancient times, the foundations of basic scientific ideas were formed. In the Middle Ages much of the classical knowledge was lost and science suffered a setback. The Renaissance led to revival of scientific study and rational thought. It was further strengthened in the age of reason. In the age of Enlightenment, science developed as strong discipline which rejected superstition and was based only on reason. Scientist throughout these stages developed new theories, corrected and rejected old ones.

5.5. UNIT END QUESTIONS

- Q.1. Write a note on Science as knowledge.
- Q.2. Enlist important scientific contributions made during the renaissance.
- Q.3. Describe the age of Enlightenment.



6

SCIENCE AND TECHNOLOGY I

B. APPLICATION OF SCIENCE - SCIENTIFIC TEMPER AND TECHNOLOGY

Unit Structure:-

- 6.0 Objectives
- 6.1 Introduction
- 6.2 The Scientific method
- 6.3 Objectivity
- 6.4 Scientific temper
- 6.5 Superstitions, myths and prejudices.
- 6.6 Technology
- 6.7 Summary
- 6.8 Unit End Questions

6.0 OBJECTIVES

1. To understand the meaning of scientific method
2. To analyze role of science in busting myths and eradicating superstitions
3. To learn about technology and the relationship between science and technology

6.1 INTRODUCTION

Science is developed from the need of understanding the natural phenomena. It is a set of complex theories and ideas based on observing, testing, analyzing and then presenting phenomena. Scientist have developed several techniques to achieve this. The general process that has thus been formulated is known as the scientific method.

The scientific knowledge accumulated over the years has helped man to apply rationale and logic to everyday life as well. It has proved several superstitions and blind beliefs as wrong. The most important part of application of science is technology.

6.2 THE SCIENTIFIC METHOD

The logical process adopted by scientists to develop knowledge of nature and present it as acceptable fact is known as the scientific method. This method is based on gathering empirical data through observation and experimentation and the formulation and testing of hypotheses.

The scientific method consists of the following four elements:

- a) **Defining research problem:** To determine what phenomenon has to be understood, what has to be observed and how it has to be measured.
- b) **Hypotheses:** hypothesis is a logical predictive statement regarding the outcome of the research. Developing hypothesis provides direction to the research. A hypothesis can be proved wrong during the process of research. In this case also it is helpful because it helps to find out other logical steps to reach a certain conclusion.
- c) **Observation and experimentation:** testing characterization, hypothesis, predictions. Verify the empirical data.
- d) **Conclusions:** based on experimentation and logic, derive conclusions to understand the phenomena.

By following this process, new theories can be developed, existing theories can be tested under new hypothesis also existing hypotheses can be verified through new experiments devised to test them.

6.2.1 Observation

Observation of a particular element means to notice and study it, in “as it is” form. In scientific observation several techniques are applied for investigating phenomena and acquiring knowledge.

The observer does not change anything in the phenomena and remains neutral during the observation process. The empirical data gathered through observation is subjective based on observer. To rule out such errors scientific instruments are used. They help to channelize the sense through a particular channel and help to avoid differences in sensory perceptions like optical illusions. Standard units of measurements are followed during observation. Measuring of qualitative data helps in comparing and testing it.

Since the observer does not interfere in the natural form of the phenomena during observation best of the factual data can be

collected during this process. It also becomes a basic step while forming hypothesis.

Observation cannot singularly become the basis of developing a theory. The empirical data collected through observation has to be based on certain strong foundations. For this they should be verifiable. Experimentation of observed information is the best way to quantify data and arrive at conclusions.

6.2.2 Experimentation

Experiments are processes devised to verify the validity of the hypothesis and understand the empirical data under selected conditions. An experiment is the test which tests the observations and brings out such results that add to the knowledge of the phenomena. During an experiment the scientists observe the phenomena in a controlled environment. Some experiments are however such that natural environments are necessary for the elements to function.

The experiments are devised in a manner such that the hypothesis can be tested using various parameters. It should be repeatable to enable further checking by any other scientists. Experiment is not the ultimate step to understand phenomena. It is coupled with observation. Scientists can skip experimentation in certain cases where observational data explains fact, logic, intuition and even sometimes accidents reveal information.

The scientist has to follow basic scientific steps while designing an experiment. Certain experiments do not produce immediate results. In such cases all variables that will remain constant as well as those which will change have to be considered. Errors can occur during experiments. This can lead to false results, biased conclusions or failure of hypothesis. Conducting experiments more than once to verify the results is the best way to understand the phenomena. Experiments answer 'why' and / or 'how' a certain phenomena occurs. If the experiments bear expected results, it may become a theory. If the experiment fails the method is ruled out for further research or adopted with accepted modifications.

6.3 OBJECTIVITY

Though intuition and logic are considered to be some of the methods to arrive at scientific conclusion, they are not considered to be valid unless supported by evidences. Empirical data collected through observation and verified through experimentation is the standard basis for scientific knowledge. Conclusions are drawn based on systematic analysis. Such scientific method is devised to rule out any bias on the part of the researcher. Scientists are

humans and hence study made by them is subjected to be influenced by their perception.

Scientific objectivity assumes that the experiments have been properly performed and the quantitative data has not been tampered with. If the data is objectively obtained then its results are acceptable and reliable. Sources and experiments can be verified to authenticate the theories presented. Scientific objectivity thus also implies sharing of knowledge available for testing. Hypotheses should be subject to criticism. Only then can they invite further research and development.

It also brings out the element of scientific measurement. Such standard measurement is developed that can be used by other scientists except the originator to further develop the theory. It expects *universality of empirical tests*

Apart from measurement the experiment also becomes an element in objectivity. The experiment for validation of hypothesis should be devised in such a manner that it can be repeated. If the experiment performed by other scientists produces same results only then does the theory proposed becomes acceptable. Reproducibility of scientific experiments is required for universal acceptance and objectivity.

Scientific objectivity ensures that no knowledge is imposed in the society which is not verifiable. It also ascertains that personal biases, emotional involvement and personal beliefs do not interfere with formation of scientific knowledge. Scientific knowledge is not only useful in theoretical studies but also for general knowledge and development of education. Stress on objectivity makes sure that scientific results and theories are presented in most unambiguous and simple manner.

6.4 SCIENTIFIC TEMPER

The attitude which enables man to apply logic and arrive at decisions based on reliable and practical knowledge is said to be **scientific temper**. It implies application of reasoning and avoidance of preconceived notions as beliefs.

General views and beliefs develop because of traditionally accepted views or because it is believed by important persons or given in religious books. Scientific temper demands scrutiny of a certain idea before believing it. Discussions over it, arguing to prove or disprove its validity are methods used to arrive at scientific knowledge with the application of scientific temper. This attitude helps to dismiss superstitions and blind beliefs. It encourages an open mind which strives to achieve best possible reliable knowledge.

Importance: The progress of a society today is said to depend upon its member's attitude towards critical enquiry. Lack of such critical approach can lead to imposition of unjust rules and dogmatic ideas on the people. Such a society will be weak. Thus, scientific temper is necessary for the establishment of a politically, socially and intellectually strong society.

Pandit Jawaharlal Nehru, the first Prime Minister of India, was a keen advisor of scientific temper. The makers of our Indian constitution also realized its importance and hence have included "the development of scientific temper and spirit of inquiry" as one of the Fundamental Duty (article 51 A) of Indian citizens. By developing such attitude humanism can be fostered among the people. It will help in formation of a peaceful and civilized society.

India is a land of long history of tradition and also a land of several religions. Heavy emphasis on both tradition and religion create obstacle in the development of scientific temper in the country. This attitude is a severe need of the society. Superstitions and blind faith has given rise to many social crimes and injustices. It has also become hindrance to development of the society. The importance of religion has also led to tensions among various religious groups. Under the name of worship, rituals and dogmatic religious customs, several sections of the society are exploited. Even when India is making new history with atomic development, space researches and technological advancement, such conditions prevail. To counter such sad condition of Indian society, the development of scientific temper becomes the need of an hour.

Scientific temper can be encouraged through education. A spirit of inquiry should be developed at young age. Answers with proper logic should be provided to questions of the young rather than just dismissing them. Through history, tradition should be taught to develop a sense of identity; they should not be imposed without reasoning. The present generation should become more acceptable to reform. Challenge to tradition should be looked in the light of progress if it is based on strong logical grounds. It should be understood that scientific temper does not mean rejection of faith or imposition of western culture. It implies a logical and proper understanding of one's culture and nature

6.5 SUPERSTITIONS, MYTHS AND PREJUDICES

a. Superstitions

Superstitions have been a part of human society since ancient times. It is known to develop because humans fear that which they cannot explain. By making some beliefs about it they try to avoid or to overcome this fear. It is such a belief which is not

based on any reason. Superstitions are linked with traditions and many a times with good and bad omens. Many have come down as traditions. However not all traditions are superstitions.

Many a times superstition induces a man to behave irrationally. For e.g. Because of the superstition of the day goes bad when a cat crosses one's road, many people get petrified when such incidence happens and lose all confidence. Some people avoid taking new work or things on certain days of the week because they believe these days are unlucky, and sometimes they miss out on good opportunities in life. Superstitions have become sources of social problems also. The belief of a son is needed to carry legacy of family has resulted in female infanticide in the society. Animal and human sacrifice is carried in the name of bringing wealth, prosperity and many a times rains.

Science plays a very important role in the eradication of superstition. Science requires proof and empirical data for coming to conclusions. Superstitions are challenged by scientific method in which they have failed completely. A spirit of inquiry can provide answers to many unexplained phenomena and clear out fears related to it. The superstition of snake drinking milk on naag panchami, or bad omen due to the sight of an owl and many banned activities like not cooking on eclipse days are proved to be baseless through scientific experiments.

In a country of beliefs like India, complete eradication of superstitions is still not achieved. However with the greater spread of scientific knowledge it will not be distant dream.

b. Myths

Myths are stories which may be or may not be true. It is based on tradition or legend. They have deep symbolic meaning in it. They are often used to explain beginnings of supernatural beings. It is generally believed that myths were formed to explain some natural phenomena. They are passed down from one generation to another. Myths often convey misleading or wrong knowledge. Therefore scientists work towards proving these myths wrong with various experiments and theories. Myths have importance in history but are mixed with lies. They make interesting stories but cannot be completely believed.

Almost all cultures over the world have their own myths. Some myths have become part of religious explanations. For example the earliest known myth supported by the Bible was, the earth revolved around the sun and the earth was flat. Scientists since the 13th century have found evidence and tried to explain that the earth was round. The sun is stationery, while the earth and other planets revolve around it. It was only by the 17th century that the church accepted this fact. There are varied theories which

explain the creation of the universe. Many of these including the Greek and Hindu mythology explain that the creation of the universe was a gradual process and some order was brought in this world by supernatural forces. While much of it might be unreal, the essence of it may be the same as the Big Bang theory given by the scientists. As new scientific knowledge was gained, gradually many other such myths were broken. There is therefore an opposite relationship between myth and science. Science is progressive, while myths are incorrect knowledge disguised as truths.

c. Prejudices

Prejudices are unfavorable or negative opinions held by people without any knowledge or examination of facts. Prejudices are created in minds of people because of certain stereotypes associated with religion, caste, region, sexuality or nationality of a person. There might be some negative experiences behind development of such attitudes. Such attitudes also pass from one generation to another. For e.g. the phrase of kanjus Marwari in colloquial has developed because of the strict business attitude of the Marwari's. There is general prejudice among urban people that rural people are uneducated, backward minded and poor.

Such negative attitudes have become problems in societies. They lead to disruption of social peace. Such prejudices also bring divide among the people, thus hampering unity in the nation. Minority communities especially suffer inequality and injustice due to prejudices.

Science has helped establish facts among human beings that entire human kind is the same. It emphasizes on knowledge. It accepts the fact that society's progress is based on new theories and laws which are based on facts and not beliefs. Science has proved that any person from any region or cultural background has equal right to exist and respect in the society. Thus, scientific knowledge and scientific temper is necessary for social harmony and development. Scientific temper helps to develop harmonious relationship among people. This spirit of scientific temper can be spread through the medium of education, media and youth.

Check your progress

- Q.1. Explain the meaning of scientific method.
- Q.2. Describe the process of observation
- Q.3. What is the importance of experiment in scientific method?
- Q.4. Explain the importance of objectivity in science.
- Q.5. What is scientific temper? Why is it important?

Q.6. How does scientific temper help in eradicating superstitions and blind faith?

6.6. TECHNOLOGY

In simple words technology is the application of scientific knowledge. It means production of such machinery, arrangements and procedures meant to achieve a certain goal or perform a function. Today every field of human work, from industry to medicine, is affected by and improved with technology. The first stone tool created by man was a technological production at that time since it was a product of man's knowledge.

6.6.1. Features of technology

Technology is not confined to use in one sector only. With more and more developed scientific knowledge a better technology is induced. New technology makes the earlier one inadequate. As technology is productive it also has its demerits. Following are the important features or characteristics of technology;

1. **It has value:** Technology has a lot of utilitarian value to mankind. It has made even day to day jobs simpler with machines such as the fan, calculator, water pump etc. technological progress was responsible for the Industrial Revolution in Europe, which changed the economy as well as the political conditions of the world.
2. **Product of creativity:** Technology is the product of scientist's creative ideas based on scientific theories and laws. For e. g. the kitchen microwave is based on the use of electromagnetic waves. Electricity is produced using the kinetic energy of water. The imagination of men combined with advancing mechanical science has led to the creation of humanoid robots.
3. **Problem solving:** Right from the problem of survival during the Stone Age to the problem of sustainable living in the modern age, technology has the power to solve problems. The technology of dam building helped man save and utilize water even apart from rainy season. Technology has helped

solve agricultural problems in India as well as in smaller nations.

4. **It has demerits:** Every technological product has a negative effect on humans as well as on nature. With industrial progress the problem of pollution increased. Nuclear energy is a great alternative for non-renewable resources but it has health hazards for humans as well as other living organisms on the planet. Several technological devices are also expensive. Technology is not foolproof. Systems can fail, some damages can be irreparable. The impact of damages done by technology can be reduced but failures cannot be avoided completely.
1. **Social change:** Technology has completely—and irreversibly—changed the way people meet, interact, learn, work, play, travel, worship, and do business. It has brought people from various regions around the world together through better communication, travelling and networking. This has made exchange of cultures possible. The world has turned into a 'global village' in the 20th century due to technology.

6.6.2. Role of technology

Technology has helped increasing productivity and efficiency in every field that it is employed.

1. **Agriculture:** Technology has helped to improve agricultural production all over the world with the use of tractors and other machines. It has improved productivity in low rainfall lands with new methods of irrigation. It has also enhanced food quality with use of fertilizers, pesticides and also new seed qualities.
2. **Transport and communication:** Man's travel is not only increased in speed but also in safety owing to new technological inventions in transport. Air travel is common today and also safe. Transportation technology has helped develop better trade too.

The internet has revolutionized communication among people. Since communication technology is one of the cheaply available modes, it has connected people even from remotest areas. Today the world is at one's fingertips with ipads, tablets and Smartphones.

3. **Industry:** Production is made easier with the help of computers which handle much of the work, minimizing the efforts of labourers. In some factories such as car production, the entire production process is run by robots. In

many of the industries today, designs and test models are designed on computers completely and viewed with 3D technology before making the actual product. Technology has reduced the cost of production and increased the efficiency in production on a large scale. One of the disadvantages of technology based industry is unemployment especially in labour intensive countries like India.

4. **Services:** The service sector has also been improved with technology. Booking tickets, shopping, handling bank accounts and even setting up a business, such works are easily done with the help of computers and internet.
5. **Medicine:** Advanced medical inventions have helped to cure many diseases. Vaccinations, diagnosis and operation equipments have increased the lives of people by detecting life threatening diseases at early stages and performing microscopic surgeries on highly risky organs like the heart and the brain. Many diseases like polio, chicken pox etc are completely curable today.

Technology has changed media and its forms. Man has reached space and is researching more about the universe with advancing space technology. Many other fields like construction, logistics, education and commerce have also progressed with better technology.

6.6.3. Interrelation between science and technology

The very definition of technology explains it as an extension of science. The relationship between the both has several dimensions. Following points explain the interrelation between science and technology:

1. **Technological application:**

New scientific knowledge leads to its application in a new field and for a new purpose. For .e. g. the discovery of nano science has lead to advancement not only in computer technology but also in cosmetics and refrigerators. Technology is the way by which scientific knowledge is combined with practical value and put to the benefit of humankind. Both science and technology are based on experimentation and creation.

2. **Exemplary relationship**

Scientists explain natural phenomena on the basis of experiments. Many a times such experiments are done on instruments, tools and machines developed through earlier technologies.

Such technological aids help in understanding and explaining scientific concepts better.

1. Instrumental relationship

Scientists require different machinery to find out, test and present information. They need accurate machinery for this purpose. Technology is aimed to provide sciences with such devices that further increase scientific knowledge. Sometimes machinery produced for one purpose is used for another scientific experiment. For e.g. telescope invented by an optician in Europe, was later used and developed by Galileo for studying space. Skills and knowledge of the technologists can be thus used to advance science.

2. Inspirational relationship

Science and technology take inspiration from one another for further development. Based on basic electrical sciences, engineers develop such machinery which is used in advanced electrical appliances. On the other hand, some technological devices provide science explanation of some unknown phenomena. For e.g. the invention of steam engine later gave basis for the creation of thermodynamics theory in physics. Thus the instrument gave foundation to research in science.

6.6.4. Science and technology are different

Though we have seen that both science and technology are related in many ways, they are different in nature. The following points can better explain the distinction between them:

1. Purpose:

Science and technology have fundamentally different purposes. The main aim of science is to explain natural phenomenon through scientific method of observation and experimentation. Technology aims at creation of a product through intellect and design based concepts and methods. While science only observes and understands, technology intervenes in nature. Rather than meeting a human need or opportunity, it is primarily driven by curiosity about something.

2. Aims

Technology aims at the satisfaction of the end users of a product, process or environment. Science aims at discovery or verification of a certain element of nature.

3. Role of value:

Scientific knowledge is objective. The theories and laws developed as scientific knowledge cannot be termed good or bad. However technological products do have negative implications on human nature. For e.g. nuclear power and its use as scientific knowledge is not bad, however bomb producing technology for terror purpose is surely inhuman.

4. Evaluation methods

Scientific knowledge is evaluated through analysis of data. Theories are created and they are tested over various experiments and on the basis of several hypotheses. Other scientists have to give validation to the theories as being true so that they can be established as laws or universal facts. Technological products are not based on assumptions and hypothesis but verified on the basis of analysis of designs. Thus no validation for truth is required in technology.

Science involves formation of theories based on accurate data, while technology involves use of available data to create approximate models. Technology is therefore different from science in its goals, methodology and also final product.

6.7 SUMMARY

Science as a discipline is very wide. It develops theories and explanations about natural phenomena by following the scientific method. Development of scientific temper is essential for better social life. It removes untrue baseless beliefs from people's lives and also brings peace and harmony and equality in society. Technology is everyday science. It has made human life convenient and advanced. Technology and science help each other progress. They are distinct from one another in nature, aims and methods.

6.8 UNIT END QUESTIONS

- Q.1. Explain the meaning and features of technology.
- Q.2. What role does technology play in everyday life of man?
- Q.3. How are science and technology related?
- Q.4. Bring out the differences between science and technology.



7

SOFT SKILLS FOR EFFECTIVE INTERPERSONAL COMMUNICATION

Unit Structure:-

- 7.0 Objectives
- 7.1 Effective Listening
- 7.2 Verbal and non verbal communication
- 7.3 Public speaking
- 7.4 Presentation skills
- 7.5 Barriers to effective communication
- 7.6 Importance of Self Awareness and Body Language
- 7.7 Channels of communication
- 7.8 Writing formal applications
- 7.9 Preparation
- 7.10 Leadership Skills and Self-improvement
- 7.11 Summary
- 7.12 Unit End Questions

7.0 OBJECTIVES

1. To bring out the importance of listening in communication
2. To analyze the methods of communication
3. To learn about skills relating to public speaking and presentation
4. To know the importance of body language for effective communication.

7.1 EFFECTIVE LISTENING

Communication happens between the one who communicates that is sender of information and one who responds or the receiver. Both have an important role to play for smooth and efficient communication. Listening is one of the important elements of communication. A message is said to be well communicated only if it is listened by the receiver and responded properly. Many people find talking more interesting than listening.

7.1.1 Meaning

Listening and hearing are two different concepts. Listening is a conscious activity which involves both physical and intellectual functions. It is a dynamic process. In other words, when a person

carefully pays attention to the words that he hears and understands them he is said to be listening. Hearing is the physical activity carried out by the ear involuntarily. Whether a person wants to hear a sound or not, the ear will accept. Listening on the other hand is different. Even while sounds of the words are heard by the receiver, if the receiver is inattentive and uninterested, he may not understand the message. He will not be able to become a part of the communication. Thus, listening is an active process while hearing is a passive activity.

Listening means understanding the message given by the speaker and interpreting it correctly. It can be achieved by improving patience and concentration.

7.1.2 Features of listening

A good listener enhances the quality of discussions. Following are features of listening:

1. **A dynamic process:** Effective listening is the characteristic of a good communicator. It is an active process in which the listener pays attention to the message, spoken and not clearly spoken by the speaker. He then interprets and evaluates the message. Giving feedback is important to show involvement in dialogue. Feedback can be in gestures or simple sounds of agreement.
2. **Aims:** Depending upon the audience, the aims of listening are different. Sometimes it also depends on the content or the speaker. The audience sometimes appreciates the views and ideas expressed by the speaker. e. g. during the speech of a political leader in his rally. Sometimes they listen and empathize with the speaker e. g. students listening to experiences of alumni. A listener sometimes listens to selectively only that content which is relevant to him. Judges in any competition always have a critical mind and listen with the aim of evaluating the speaker.
3. **Obstacles:** Certain problems can affect the process of listening. Following are a few of them:
 - a) **Force:** if the audience is forced to listen to the speaker, they cannot concentrate.
 - b) **Language:** if the audience is not well versed in the language in which the speaker speaks, they may not be able to understand the message even if they are willing to pay attention.

- c) **Emotional barrier:** if the listener is upset or disturbed emotionally then he will not be able to pay complete attention to the speaker.
- d) **Environmental problem:** noisy environment or uncomfortable space can disturb the listener, affecting the listening process of the audience.
1. **Retention of information:** the listener interprets and understands the speaker's message. However, after a period of time, not all the information listened can be retained by him. To increase the retention of the listeners, speakers should take aid of visual aids and examples to communicate the information. The information should be presented in such a way that it relates to every audience, so they can retain it for their benefit. Taking notes while listening to the speaker can help the listener to have reference points with him even after a long time.
 2. **Requires patience:** Listening requires involvement in communication. A good listener is one who listens patiently to the speaker and makes a mental note of all points covered by him. A listener should patiently wait for his chance to speak. In case of discussions or debate, a listener should wait for an opportune moment to speak about his views. After attentive listening he will be in a good position to score points for him. Patient listening allows the listener to understand the speaker and his message well. Thus the listener doesn't make any opinions based on ill judgment but based on proper information. Listener should avoid interrupting the speaker unnecessarily.
 3. **Listening can be improved:** There is formal training for improving communication skills in reading, writing and speaking. There is no such training available for listening. Listening requires a correct attitude and interest. This positive attitude can be brought by developing the willingness to listen. By bringing discipline and self-control one can improve his listening skills.

7.1.3 Importance of effective listening

Studies have shown that human brain's listening capacity is much higher than its speaking capacity. We should utilize this feature of our brain to develop effective listening. Listening not only improves communication but also develops good relationships and delivers good results. Following points bring out the importance of listening:

1. **Effective communication:** The listener is an essential part of communication. Effective listening ensures clear transmission of information from speaker to listener. By attentive listening the listener can appreciate the speaker's efforts to communicate properly. He can also bring out defects in the speaker. E.g. students who listen attentively can point out if any wrong information is given by the teacher, or convey to him during the lecture that the concept is not clear.
2. **Develops better understanding:** By effective listening misunderstandings can be avoided. Since sometimes there is no written record of spoken message, misunderstandings can occur.
3. **Improve relationships:** It can help to solve several problems in relationships. Elder members of the family feel satisfied and loved when they get a chance to share their experiences with people who listen carefully to their talk. Parents can help identify problems of their children if they listen to them attentively and look for unspoken messages and emotions in their talk.
4. **Help to obtain information:** The speaker expresses his ideas and emotions through his talk. Effective listening can help a person to get information from the talk directly or indirectly. The listener can develop his own ideas based on the information given by the speaker.
5. **Helps in making decisions:** Listening to the concerned groups ideas and opinions can help authorities make proper decisions. For e.g. by listening to the suggestions and opinions of both the superiors and juniors, management can make decisions that can benefit the organization as a whole. It can help the organization to form better policies which offer solutions to the grievances of its employees.
6. **Provide encouragement:** Effective listening provides encouragement to both the listeners and the speakers. Speakers get encouraged to communicate more effectively looking at the involvement and response of the listeners. Listeners are encouraged to participate in the communication when they listen effectively especially during group discussions. Effective listening equips a person with an open mind. It helps him explore new ideas, appreciate other people and also evaluate them based on their ideas.

Check your progress

Q.1. What do you mean by effective listening?

Q.2. Enlist the features of effective listening?

7.2 VERBAL AND NON VERBAL COMMUNICATION

The method of communication differs in all cases. It depends on several factors such as the information provider, the target audience, type of message and many a times on the place in which the communication is taking place. Throughout human history, several modes of communication are developed by man and the list is growing with new technology. However, basically, there are two major ways of communication namely verbal and non verbal.

7.2.1 Verbal communication

Verbal means relating to words or use of word, written or spoken. Thus verbal communication includes oral and written communication.

7.2.2 Oral communication

Man learnt writing much later. Thus for a long period of human existence communication among people was largely in oral form. Any form of communication with the help of spoken word is oral communication. Oral form is used both in formal and informal communications. Speech connects to people more than any other method of contact.

Oral communication can be classified further in personal and non - personal types. Personal communication is in which there is face to face dialogue. e.g. discussion in classrooms, seminars, speeches, gossip, interviews etc. Non -personal communication does not include face to face dialogue. e.g. radio shows, telephonic conversation etc.

7.2.3 Written communication

Effective writing requires planning. One has to use proper words and form the matter in such a way that the message is clearly understood. It is an important form of communication in formal world in the form of letters, memos, reports, acts, laws etc. It is also used for informal communications like letters, invitations, notes etc.

Advantages –

1. **Permanent and legal:** Written communication can be preserved permanently and can be referred when required in the future. If written communications has signature of a person or seal of an organization then it gains legal status and can be produced in court as legal evidence.
2. **Accurate and precise:** The writer plans the content to convey message to the concerned receiver. Thus written communication is accurate and precise. This reduces the chances of misunderstandings as well.
3. **Accountability:** Since the name, place of the sender of the written message can be traced down even if it is not mentioned on the written document, the sender can be held accountable for his message. In official communications, the message contains the name or signature of the sender.
4. **Large and widespread audience:** If the message has to reach a larger number of receivers then written communication is a better option. It helps to communicate the message in exact same form at the same time. It is also viable option for audience spread across geographical areas, like various branches of the office.

Check your progress

Q.1. Name and explains the types of communication.

Q.2. State the differences between oral and written communication.

7.2.5 Non Verbal Communication

Any form of communication that does not involve the use of words instead communication takes place through gesture, display of emotions, movements, eye contact etc. is said to be non verbal communication. Sometimes non verbal form is used along with verbal form. However, on its own too, non verbal form can be used to convey messages along with feedback.

1. **Sign language:**

Audio visuals signs are used by people to indicate a certain message.

Various forms of visual signs are posters, colours, graphical representations etc. Posters signs represent a certain idea or message in a combination of pictures and slogans. They are used during rallies and drives for a cause, such as anti smoking drive. A sign board with a picture can tell a message too, e. g. a skull on the electric meter board or drawings of men and women on doors of public toilets. Each colour represents a specific emotion. For e. g. blue indicates cool and calm feeling while red indicates passion. Data is presented in graphical formats like pie charts, graphs and tables to show relationship between various elements or compare data.

Some sounds are used in specific areas to convey messages. For e. g. the factory siren indicates lunch time for workers. In BEST buses the conductors ring the bell in various combinations to communicate with the driver to move or stop etc.

1. **Body language**

The science related to the study of the way human body communicated without the use of words through movements of its parts is known as Kinesics. It includes facial expressions, postures and physical appearances.

- a) **Facial expressions:** It is often said that human face is the monitor of the human mind. What a person feels or thinks is shown by the various forms of facial expressions. As smile conveys compassion, tight muscles of cheek and clenched jaw show anger. Thus one should control what kind of expressions is reflected on their faces.
- b) **Posture:** Whatever the size and shape of the body be, one can tell about the state of mind of a person by studying their body posture. A person with self confidence walks with shoulders spread and raised chin. A bend in the back while sitting or standing shows tension and lack of confidence.
- c) **Gestures:** Certain movements of arms, legs, head and hands can be used to indicate our emotions and thoughts. A gesture is strong way of letting people know about thought without words. Gestures such as nodding, eye contact, tilting the head during a talk made by audiences shows their involvement and attention towards the speaker. Throwing a fist at somebody shows anger, fiddling with objects during a talk or shaking leg shows nervousness. Certain gestures in different cultures may mean different things. For e. g. nodding of the head up and own means saying yes in India but it means a no in Bulgaria.

- d) **Physical appearance:** The complete personality of the person that reflects by his physical appearance i.e. clothing, hair etc tells about his opinions and ideas. The colour of the clothes, their style, and style of hair reflects the person's confidence.

2. Para-language

Paralanguage means the various features of speaking which communicate a message just "like language". Para linguistics is the study of pitch variation, speed of speaking, pauses, volume variation and use of fillers. The speaker has to control the manner in which he speaks to communicate his message in a better manner. The way in which the speaker speaks conveys his ideas as well. It can be understood better with the help of following points:

- a) **Pitch variation:** Pitch of the voice is its range. The speaker can speak at a higher, lower or moderate pitch according to the intensity of the content or to draw attention of the listeners to some important message. Use of same pitch for a long time makes the talk boring. In general conversations the voice pitch shows the excitement levels of the speaker. A very low pitch shows bad mood while an angry person talks in a high pitch.
- b) **Speed of speaking:** People who are scared of situation or nervous speak fast in such times. Control over speed of talk is important during lectures and presentations. If the lecturer thinks that the students do not understand a certain concept then he can explain it again at lower speed.
- c) **Pause:** Continuous speaking makes it difficult for the audience to understand the message. It is important to pause at appropriate times. A speaker may pause for some time before explaining new point to see if the audience has completely understood the earlier point. He may also pause expecting any remark or reaction from the audience.
- d) **Volume variation:** It is important for a person to have control over volume of his voice. One can adjust the volume of voice depending upon the place where he is talking, number of people he is talking to etc. for example a person presenting before a group of 50 people speaks slowly then people away from him may lose interest because they are not able to listen to him.
- e) **Fillers:** Non fluencies or fillers are short words which are used to connect to the audience in a better way. For e. g. the use of alright, ok, you know in between sentences helps to draw attention, maintain continuity and also make a special

impact of a particular sentence. However, over usage of such words should be avoided. This can irritate the audience.

3. Silence

Silence can also convey the mood, message or response of a person. It can be used to indicate positive reactions like approval, consent or agreement. It can also show negative response such as disapproval, anger or sorrow. During a talk silence can be used in pauses to give the audience time to think and react.

a) Space

The study of use of space for communication is known as Proxemics. The amount of space a person keeps with others during communication depends upon various factors like relationship, surrounding, social norms etc. The normal amount of space during casual conversations at personal level between the communicators is about 18 inches to 4 feet. When the relationship among people and the environment is formal, the distance may be between 4 to 12 feet. Beyond 12 feet the space becomes a public space. The relationships are formal and number of people involved in this is greater. The type of conversation also decides the use of space. Proxemics also involves seating arrangement and territoriality. Example parking one's vehicle in the same place everyday shows marking of personal space. If a person wants to be more involved with the speaker and is interested in the talk he may take a seat in the first few rows of the auditorium.

b) Time

The use of time by a person tells about his personality. A person who is punctual and manages time well is considered discipline and gains respect among colleagues and subordinates for this quality. Using one's time well is also a quality. People who arrive late for meetings give a negative impression about themselves.

c) Touch

Haptics is the study of touching. In different cultures touching has different meanings. A firm handshake is a symbol of confidence. A hug may be considered friendly way of greeting in some cultures but in some cultures it is conserved offensive.

Advantages –

1. **Facilitates interaction:** Non verbal communication is advantageous when the audience has certain imparities such as hearing problem, slow learning or even illiteracy. Even otherwise, the speaker can strike a good interaction

with the audience because of his informal gestures and use of signs.

2. **Creates impact:** Visuals and graphics make an impact on the minds of the audience. They are able to recall it even after a longer period of time and relate information with such visual memory. Positive gestures and confident body language creates a good impression on them. Thus it enhances communication.
3. **Develops relations:** Positive body language and facial expressions attract people. They send vibes of warmth and happiness. So it helps to create and develop relationships in both formal and informal settings.

Disadvantages –

1. **Problem of misunderstanding:** Sign and body language can be misunderstood by the audience. Colours, visual signs and gestures may have different meaning to people from different cultures. Thus a wrong message could reach the people. People may also identify voice variation differently. For e .g. if the speaker is speaking in high pitch to emphasize on a point better the audience may see it is aggressiveness.
2. **Irritation:** Audience may get irritated with the use of fluencies if used frequently by the speaker. It may distract the audience as well.
3. **Quality of communication:** Sometimes the speaker maybe good in use of non verbal communication to keep the audience interested but may lack content in his talk. Quality of the communication is also important with attractiveness.

Check your progress

Q.1 Define non verbal communication.

Q.2. Discuss any 3 types of non verbal communication.

7.3 PUBLIC SPEAKING

Public speaking means the process of speaking to a group of people in a structured manner. It is a powerful medium for motivation, influence, informing and entertainment. Many people have stage fear that is fear to speak in public while some can engage the audience for a very long time. Fear and nervousness

can be overcome by practicing some basic steps and improving one's confidence level. Following are a few of the essential elements to develop oneself as a good public speaker:

1. **Structuring the talk:** Whatever the purpose of the public talk is, the speaker should prepare the talk in stages of introduction, main explanation and conclusion. Such practice will help the speaker to convey message to the audience according to their understanding levels without making it boring. It will give the audience a clear idea of what they have to expect from the talk and also prepare questions at the end.
2. **Preparation:** Even experts need preparation. It is better to have an idea of the time allotted for the talk, the purpose and prepare accordingly. Preparation in advance will reduce the possibilities of mistakes during the talk.
3. **Analyze the audience:** The speaker should keep in mind the target audience and use language and examples accordingly. For e .g. an archaeologist will prepare a different format of speech archaeology to present in a seminar in front of scholars; while the format will be different for the same topic if he has to present in front of students.
4. **Short sentences:** Short sentences are better to understand. They help to keep the audience interested. Audience may lose track of the actual content while listening to long and complex sentences. It helps to maintain the flow of communication.
5. **Expressive speech:** People lose interest if an interesting topic is presented in a boring manner. A speaker should use decorative language to describe the content and help the audience visualize the topic that is spoken about. He can draw examples from day to day life to help the audience relax with his talk. He should use humour to keep the audience connected and refresh them after some time. Information can be given through humorous instances. The speaker's enthusiasm for the subject should be seen in his speech.
6. **Composed body language:** The speaker can take control of attention of the entire audience only when he is calm and relaxed himself. Tension and nervousness of facing a huge audience takes away confidence. To deal with this the speaker has to perform this natural form. Being confident, cheerful creates a positive impact on the audience.

7. **Seek feedback:** Involvement of audience during a talk is important. One can ask a few rhetorical questions in between the talk. After the talk a feedback from the audience is advisable. One can ask questions to the audience and encourage them to participate. Questions from the audiences should also be welcomed.

7.4 PRESENTATION SKILLS

Presentation is slightly different from public speaking and so it requires a different set of skills. The purpose of a presentation is always more formal than a public talk. Presentation is a professional practice to demonstrate data, research, reports or new information. They are done on several occasions by students for their projects, business persons to present data for clients, and also scientists to present reports etc.

The presenter has to keep in mind the following point to make an effective presentation:

1. **Structure the presentation:** Presentations are scheduled for events. Thus a presenter should utilize time well to prepare the presentation. He should see to it that the presentation should convey all points he wants to say, is based on the theme of the event and has a proper direction to it. Brief the audience about the topic before beginning with complete details. Include a lot of examples to make the presentation interesting. Make a neat and point style presentation.
2. **Presentation:** Appearance of the presenter makes an impression on the audience. It is important for the presenter to be formally dressed and to be neat. Appearance of the PowerPoint presentation is equally important. A power point presentation having paragraphs, bold font, too may images with no caption, makes the audience loose connect and concentration with the main content. It also shows lack of research by the presenter.
3. **Knowing the audience:** As in any public talk it is important for presenter to know his audience. The audience expects information from the presenter. He should be able to give it to them and in the way they understand. Audience evaluates him not only on the content but also on the way it is presented.
4. **Controlling the environment:** The presenter should be comfortable in the environment he is presenting in. It is better to make all preparations like set up, checking mike, checking if PowerPoint works on the laptop etc. on his own before the presentation. It is also important to get a feel of the environment and get to know things like knowing from

where he will be presenting, whether he will be able to move around or not. This will enhance confidence, help to keep calm and concentrate completely on the talk.

4. **Keep track of time:** Usually presenters have to present within a given time slot. It is important to finish within the given time. This gives a proper impression of positive time management to the evaluators and also gives the presenter time to answer audiences questions calmly. It also shows that he respects the time of the audience. Rehearsing the presentation is important to be able to manage time as well as completely cover the topic.

7.5 BARRIERS TO EFFECTIVE COMMUNICATION

Communication through any medium is successful if the meaning of the message clearly reaches the receiver. Many a times this does not happen due to some disturbance during the passage of message or some error or absence of some quality in the sender or receiver. Any such problem or obstacle is termed as a barrier to communication.

Following are the various types of barriers to communication:

1. Physical
2. Linguistic
3. Cultural
4. Psychological
5. Organizational

1. **Physical:** Barriers that are external or related to the environment in which the communication takes place are called physical barriers. They are as follows:

- a) **Environment:** Elements of the environment such as temperature, humidity, ventilation, light of the place etc. where communication takes place affect the communication. For example, lack of proper ventilation in an auditorium can make the audience uncomfortable because of which they may not be able to concentrate on the show. Natural calamities disrupt communication mediums because of which people remain stranded for long.
- b) **Time & distance:** Time difference between two people can affect the communication between them. Some people do not meet their families for days because they have unusual work shift. People living in different time zones also have to make different arrangements to communicate each other. Distance becomes a barrier especially when messages have to be given personally.

- c) **Defects in mediums:** When a wrong medium is used to communicate, the message cannot pass to the receiver as expected. For example, written medium will not be useful to communicate with illiterate people.

Defects in the instruments used may also pose problems. For example, disconnection of internet service during a video conference or faulty telephone service.

2. Linguistic: Language is the primary tool of communication. Problem may occur in communication if there is a problem in understanding the language, pronunciation or meaning of the words.

- a) **Difference in language:** When the people wanting to communicate with one another are not familiar with each other's language they may not be able to communicate effectively. Different languages have different meanings for a single word. For example in Spanish *burro* means donkey while in Italian it means butter. Such problems create misinterpretations and misunderstandings.

- b) **Jargons:** Technical terms particular to a field are called jargons. For example people who are interested in space but are not physics students may not understand a lecture if jargons are used by experts talking in the lecture on space research. Thus the speaker should keep audience in mind and use words accordingly.

- c) **Ambiguity:** Similar words may mean different things when used in different contexts. This may cause misunderstanding. Homophones or words with same sounds but different meaning like *hair* and *hare* may create confusions during a communication. The same colour may have different symbolism in different cultures. Christian brides wear white on their wedding day; Hindu married women wear it when their husband dies. Confusion and misunderstanding due to such problems can be overcome by a proper knowledge about the culture that one is going to interact with.

- d) **Voice and tone:** If the speaker is too slow or too fast the listener may not be able to follow the conversation. If the tone used by the speaker is not proper then the meaning of the message may not effectively reach the listener. A monotonous tone makes the receiver lose interest.

3. Cultural: Opinions and thoughts of people are influenced by their culture. Culture refers to ideas, ritual, ceremonies, festivals etc of a group of people. Words, symbols, actions, etc have different meanings in different cultures. When people from different

regions interact with one another, culture may become a barrier in many ways. People may think about symbols from other cultures in their own culture's context leading to misunderstanding. Sometimes people may not understand actions and words from other culture. For example; people in India are finding it difficult to adjust with the corporate culture of calling each other by first name in work place. In India calling any senior or elder by first name is utterly rude.

4. Psychological: Communication is affected by the state of mind of both the sender and the receiver. Biases and prejudices of people, their emotional well being and general mind set affect their thoughts. Following are some of the psychological barriers:

- a) **Selective perception or filtering:** People sometimes accept only such information from the message which is relevant to them or appeals to them. This is known as selective perception. In some cases such practice is beneficial but otherwise it leads to loss of valuable information by the receiver.
- b) **Closed mind:** Some people do not like suggestions or advice given to them. They believe they know everything and can handle everything. Such closed mind affects effective communication especially in team work. Some people who do not like changes may not accept others ideas and opinions.
- c) **Poor retention:** If the receiver has poor retaining capacity then much of the information may be lost by him and so the communication may fail.
- d) **Emotions:** When a person is in bad mood or depressed it affects the communication process. Receiver's concentration may be affected if he is in bad mood or if the sender is in bad mood he may not communicate the message in proper words and tone. Nervousness also affects the way a person communicates. If a person is in stress he is unable to communicate properly, he may transfer the message in a wrong manner or receive it wrongly.
- e) **Bias & Prejudices:** When ideas about something or someone are formed without proper knowledge it is called prejudice. Prejudices block the mind and do not allow truth to be seen. Communicating with such people is difficult. They may not want to understand the message the sender wants it to be understood. Prejudices about people whom they are communicating with also affect the communication. If a person has bad impression or image of the sender, then they may not accept messages from them freely. On the other

hand, if the receiver has a very good image of the sender in their mind, they may accept any information from them.

- f) **Slanting:** Slanting means giving different meaning to the message. Thus the receiver makes inappropriate conclusions about certain information. In some cases it may be relative understanding of a term for example during a sale the rate is expressed along with the term “only”. It implies that that price is low during the sale; otherwise it would have been standard.

5. Organizational: Apart from the above mentioned barriers, there exists some peculiar barriers which can be seen in business organizations.

- a) **Excessive information:** When too much information is passed on then people tend to make errors while processing the information, or they may delay the process or they may neglect some part of the information.
- b) **Lack of common goal and planning:** People often speak without proper thinking and without any specific goal in mind which creates confusion in an organization. They may speak in a rude manner which can spoil the environment of the organization. There can arise goal conflicts between different departments or between two different individuals. For e.g. a research and development department may want more money to be spent on the development of new technologies, whereas a design and marketing department may want more money to be spent on designing and marketing of a product to increase the sale of a product.
- c) **Barriers related to positions held:** Many a times the superiors tend to pass on the orders upon their juniors or pressurize them to finish the task without carefully listening to their set of problems. On the other hand juniors may feel awkward or may hesitate to approach their boss due to lack of proper communication.

7.6 IMPORTANCE OF SELF AWARENESS AND BODY LANGUAGE

If we have to develop ourselves then first we should be able to understand ourselves better. Understanding oneself means having complete knowledge of one's physical, emotional and intellectual capacities. This understanding is termed as self awareness.

7.6.1 Meaning

Self awareness is the result of giving complete attention to oneself. When a person thoughtfully observes his mannerisms, thoughts, beliefs and tendencies, he has better realisation of his personality. Self awareness comes from this realisation. It is knowledge of what is happening within us. It is comprised of the following three specific capabilities:

- Emotional self awareness
- Accurate self assessment
- Self confidence
- **Emotional self awareness** – one has to be completely aware of his thought process and feelings. He should be able to analyse his reactions and emotions towards specific situations. Emotional self awareness means knowing which emotions dominate our actions.
- **Accurate self assessment** – one has to be aware of his strengths and weaknesses. This will help him to improve his capabilities by dealing with his weaknesses. Such practice will provide him the ability to make right choices for him. Also he will be willing to bring about necessary improvements in him to take advantage of all opportunities.
- **Self confidence** – when one is aware of his emotions, personality and attributes, he becomes confident of himself. Self confidence displays assertiveness, maturity, independence and enthusiasm in one's behaviour. However a balance in self confidence is required so that it does not affect one's behaviour and performance.

7.6.2 Importance

Self awareness is the key to success and peace. People who are aware of themselves tend to be at peace with them. This allows them to have more strengths than weaknesses. It is important to identify one's own self from within to make wise choices in personal and professional life.

1. **Acceptability:** Self awareness enables a person to accept his weaknesses. He can make himself stronger by developing his strengths and overcoming his weaknesses.

He can accept criticism of his faults and mistakes in a positive way because he knows that such attitude will help him perform better next time. He also understands weaknesses of others.

2. **Empathy:** Self awareness helps to empathise with others. It helps to take control over emotions and understand the people in difficult situation. Thus it can lead to understanding others' perspectives.
3. **Positive attitude:** Self awareness encourages optimism. People tend to a positive attitude towards favourable changes. It motivates them to take positive actions against harmful emotions and behaviour. It helps to bring out the best in oneself and improve one's self-image. Self awareness encourages people to look towards challenges with confidence.
4. **Decision making:** Self awareness guides in the process of decision making. It stimulates intuition. In complex situations intuition helps to make proper decisions. It helps to analyse and process uncertain problems. A person with proper understanding of oneself will choose a right career according to his choices and capabilities. He will invest time and efforts into developing his skills which he lacks to achieve his goals.
5. **Virtues:** A developed sense of self awareness makes a person have positive feelings and also develops good qualities in him. It makes him understanding towards the weaknesses of others. He develops humility and respect. Such people value relationships and make efforts towards maintaining them.

7.6.3 Importance of Body Language

Body language is an inseparable part of communication. Knowingly or unknowingly it conveys a lot about a person's thoughts, state of mind and sometimes also intentions. In several situations body language alone is enough to communicate. A combination of good speech and proper body language is a key to effective communication. Every type of body gestures like eye contact, movement of hands, and movement of head and facial expressions creates an impact on the communication taking place.

The importance of body language in communication can be explained in the following ways:

1. **Creates impression:** A positive body language creates a positive impression of the person.
This is important for people going for interviews.
2. **Prevents misunderstanding:** A person may not be comfortable in expressing his true emotions through words. Paying attention at facial expressions and body gestures can help in identifying clues of real feelings and intentions of the person. This can prevent misunderstandings and make the speaker comfortable.
3. **Displays confidence:** Confidence can be shown through body language. Making right amount of hand movements, maintaining eye contact, nodding head signifies giving attention, are all signs of a confident listener as well as a speaker. A person who shows such signs in group discussions and interviews gains extra points for his self-confidence. On the other hand lack of confidence is also evident by signs such as shaky leg or irregular eye contact.
4. **Aids persuasion:** Emphatic words and an assertive voice are important tools of persuasion. If these are combined with confident body language then the listener gets impressed and persuaded to listen to the entire talk. People can get convinced by non verbal communication.
5. **Facilitates communication:** Body language gives more meaning to verbal communication. By observing one's facial expressions and body gestures one can know if that person is following the communication and understanding it.

Check your progress

- Q.1. Enlist the essential requirements to be a good public speaker
- Q.2. How to make an effective presentation?
- Q.3. Name and explain the various barriers to effective communication.

7.7 CHANNELS OF COMMUNICATION

Proper and speedy communication within a business organization is very important for its smooth functioning. Whether an employer wants to communicate with the employees or a high level official wants to communicate with the employer or vice versa, the communication passes through several points of authority. This points through which communication happens is known as channels of communication. There are broadly two channels of communication:

- a. Formal
- b. Informal

7.7.1 Formal communication

Communication that takes place through the hierarchical lines of authority by following protocol is called formal communication. Types of formal communication depend on the direction of authority.

A. Types:

- 1) **Downward Communication:** It involves flow of communication from higher to lower authority that is from seniors to subordinates. Such flow involves methods like notice, circulars, memos, meeting announcements etc.
- 2) **Upward communication:** It involves flow of communication from the lower levels to higher levels in the department or organization. For example when a department manager presents his report to the general manager it is upwards communication. Methods like suggestion box, surveys, grievance redressal cells etc are used for such communication.
- 3) **Horizontal communication:** When communication takes place among the people of the same rank it is called horizontal communication. For instance the meeting of the heads of various departments in a college called for to discuss examination dates and rules is an example of horizontal communication. Apart from meetings and telephonic conversations, sharing of letter and reports are other methods that are used in this form of communication.
- 4) **Diagonal communication**
Cross-functional communication between employees at different levels of the organizational hierarchy is described as diagonal communication. When there is a need to avoid the horizontal and vertical channels of communication in decision making, the best way out would be diagonal form. For example, the executives from Human Resource (HR)

executive will have to communicate with the finance department officials for certain information on new recruits.

7.7.2 Informal communication

In every organization an informal channel of communication exists termed as the grapevine. It is called so because it stretches throughout the organization in all directions irrespective of the authority levels. It is unstructured and not under complete control of the organization. It is defined as the informal transfer of information through gossip or rumours. Informal communication occurs almost all the time in an organization. Topics from the appointment of new manager in the department, anger of a certain subordinate, change in HR policy of the organization etc., are discussed by officials of all levels amongst themselves informally. Such information is passed from one person or group to other person or group. Subordinates discuss their problems and fears related to work with each other and share their opinions over management policies.

Check your progress

- Q.1. Describe the various formal types of communication.
 Q.2. Write notes on: a) Upward communication
 b) Diagonal Communication

7.8 WRITING FORMAL APPLICATIONS

When communicating with authorities at any level, from secretary of the housing society to Corporator of the ward one has to make use of formal letters. Formal applications are written for various purposes such as job application, application for a course, permission letter etc. depending upon the purpose the structure of the letter may change. However certain features like formal style of language, use of proper words, use of short paragraphs and concise message as well as factual information remains the same in all.

We will discuss writing of mainly three forms of formal applications namely job application letter, statement of purpose and resume.

7.8.1 Formal application

A job application letter is a formal persuasive letter from the candidate to the employers. The candidate presents his eligibility and interest for the job through the letter. The letter highlights the qualifications and experience that makes the candidate a right fit for

the job. Through the letter the candidate points out ways in which he will be beneficial for the company. He requests the employers to give him an opportunity to present himself better by selecting him for an interview.

To serve all these aims it is important that the letter is structured in a proper style. It should have an interesting opening. The opening should catch the reader's attention. The main body of the letter should consist of all details about the candidate relating to the job. The employer's will not be impressed to see irrelevant information. The letter's closure should be such that it convinces the reader to take positive action.

While structuring the letter in the above style the candidate should be careful about some details. The candidate should not use very heavy words and decorative language. The letter should be in simple language with short simple sentences. Ideally the letter should be typed. It makes it easier to read. Formal fonts such as Times New Roman or Arial should be used. The font size should be readable. The candidate should thoroughly proof read the letter before dispatching it. Grammatical and spelling mistakes in the letter leave a bad impression on the employer. Enclosures made should be mentioned at the end of the letter. Proper opening and closing salutations like Respected Sir/ Madam, Yours truly/sincerely/faithfully should be used. One should sign at the end of the letter.

An application letter written in response to an advertisement is known as a **solicited letter**. The date and reference of the advertisement should be given in the letter.

When the candidate writes an application after getting information about the vacancy from an indirect source, it is known as **unsolicited letter**. The source should be clearly mentioned in the letter so that the employers can contact them for reference.

7.8.2 Statement of Purpose

After the completion of graduation a student is required to write an application essay to any institution which tells them about the student's aims, interests and knowledge for higher studies. Such an essay is generally termed as Statement of Purpose (SOP). An effective SOP makes the student eligible for admission in the applied course. The admission staff and faculty of the institute get to know more about the student apart from scores. The student should concentrate on presenting himself at his best through the SOP.

Following are guidelines that can be followed by the students:

1. Use formal sentences. Use of words such "kind of", "you know like" etc. should be avoided.

2. Do not use a lot of technical terms. It gives an impression that you are trying too hard to show your intelligence. Use simple sentences.
3. Statements should not contradict each other. Even if you had different plans about career earlier explain the manner in which you changed your plans as a better option. The review committee is concerned with your current goals.
4. The essay should answer all questions relating to the skills you acquired in your student life as well as internships and other relevant works if any. It should also project the reason for choosing the particular field for study and how passionate you are about it.
5. It should be persuasive in nature.
6. Do not exceed the maximum word limit specified by the college/university.
7. Proof read the SOP. Get it checked by professors who are writing testimonials for you. Any grammatical or spelling mistakes show carelessness.

The statement of purpose should be in the following style or structure –

1. **Introduction:** The essay should have an attention seeking introduction. It should consist of a brief introduction about yourself followed clearly with which course you are applying for.
2. **Purpose of study:** Explain why you are interested in that particular field and what makes you choose a graduate programme in it. If there is a personal story, inspiration or role model behind this interest then explain it in short. It is true that further studies will enhance your qualifications and your ultimate career goal can be achieved with this programme. Discuss new areas in the field that excites you.
3. **Reason for choosing *that* institute:** This can be explained with the help of what the programme offers. For example the programme offers the combination exactly you are interested in. Point out those subjects in particular and explain your interest in them. Explain how the programme will help you reach closer to your goal by mentioning details like particular skills you will acquire or chance to work with some noted faculty there. This will show to the review committee that you have thoroughly gone through the programme details.

4. **Special skills and experience:** It is important to mention your motivation and goals. Mention your achievements like prizes in competitions, rank in college etc. give details of any major project, paper that you have submitted during your bachelor's degree. Give details of conferences attended, internships done any special laurels won for the college in extracurricular field as well. Describe any experience that demonstrates your credibility, dependability and independence. Show what is unique about you in the relevant field. Give details about any gap in completion of course or bad scores or other records in the application form that demand explanation.

Do not write negative about yourself. The SOP should present you as unique, deserving and perfect candidate for one of the limited seats on the programme. It should focus on your strengths however without exaggerating them. Qualities not relating to the study should not be mentioned; you may be an excellent singer but that doesn't qualify you for masters in archaeology.

In sum, the Statement of Purpose is your way to introduce yourself personally to a group of intelligent people. In this statement you must present yourself in a favorable light, express your interest in them and the subject they teach and tell them why you are special enough to be admitted. It must be honest in conception, accurate in detail, and direct in address. And it must look good and be error-free.

7.8.3 Resume

A resume is a brief document that summarizes your education, employment history, and experiences that are relevant to your qualifications for a particular job for which you are applying. It is a short, point-form document. It is through the resume that the candidate gets to make an impression on the employer. The main objective of a resume is to get an interview for the job.

There is general confusion over a bio-data, curriculum vitae and resume. Bio-data is a complete record of the candidate including personal particulars by place of birth, family background followed by educational qualifications. This term is not used in most professional circles today. Curriculum Vitae is an in detail description of skills learnt at various stages of academic life and a type of responsibilities handled at the previous employments. A resume is a summary of educational qualifications, skills and professional experience of the candidate.

1. Guideline

It is important to prepare an effective resume. It should convince the employer that the candidate is well suited for the job and should be called for an interview.

A resume begins with giving personal details like address, email id, contact details etc. It is followed by mention of position sought. Mentioning career objective at the start of the resume is

advisable. It gives an impression of planning as well as ambition. Then educational qualifications and professional experience are written in reverse chronological order that is the most recent comes first. Specific skills and other achievements follow in order. Names and contacts of references can be given at the end. The resume should be signed by the candidate by hand to give it more personal touch.

Following guidelines should be followed to create a flawless resume;

1. The resume should be concise. It should not exceed two pages.
2. The resume should not have complete sentences. It should be in point form. Each skill, qualification should form a bullet point under a side heading.
3. Headings should be named properly. Example 'experience' instead of 'previous jobs'.
4. All records mentioned should be factual.
5. Negative or irrelevant information should not be mentioned.
6. Any development or training programmes attended should be mentioned.
7. A good quality paper should be used for printing it.
8. Font type and size should be formal.
9. It should be proof read carefully to rule out any grammatical or spelling mistake.
10. Resume should be submitted with a covering letter.

7.9 PREPARATION

Every important step in educational or professional life requires proper preparation. From the smallest of exam to the toughest one preparation improves confidence, success rate and also improves the person for future steps in progress.

7.9.1 Group discussion

Group discussions are formal discussions held to test the candidates' knowledge, ability to formulate their ideas and express them in the best manner possible. They are a platform for the participants to express their opinions. They are structured programmes held with a specific purpose. Group discussions can

be held for various purposes such as exchange of various views on a particular subject, facilitate decision making by involving various parties, developing information on a particular issue, problem or creating awareness about some issue.

1. Essentials for preparing for a group discussion.

Whatever the purpose of group discussions, the participants can make it successful by following some essential guidelines as given below:

- a) Think before you speak. Participant should jot down points which he is going to make in the discussion, this will help him to give direction to his talk and he can avoid contradicting himself.
- b) If he has any doubts he should clarify them with the organizers to avoid diverting from the topic or speaking irrelevantly.
- c) Taking initiative in the discussion shows leadership skills.
- d) Be assertive not dominating. If you disagree with somebody say so politely. Use persuasive language with reasoning and courtesy.
- f) Do not take anything personally. Do not get emotional about you views. Tone of voice and rate of speaking should be moderate.
- g) Every discussion is structured. Keep a tab on the time. Do not speak after the time is over. Alert people who are taking too much time and ask them politely to give others a chance to speak.
- h) Participant is judged not only on his talk but also on his body language. He should maintain calm posture and display positive attitude.

7.9.2 Interview

Interview is the final step to selection for a job. It is a face to face communication held between the candidate and the employer. Candidate must well prepare his answers and also questions related to the job profile if any. Following guidelines can help the candidate to present himself confidently and get his chances of being selected stronger.

- a) **Technical knowledge:** The candidate must be thorough with technical knowledge related to the position sought. He should be aware of recent developments in his field. He should be able to explain any query related to the records

mentioned in the resume. Candidate should think before he answers any question. If he does not know any answer he should say so directly. Avoid giving fake answers.

- b) **Appearance:** Candidate should dress formally. Clothes, footwear and hairdo should be comfortable.
- c) **Punctuality:** It is advisable to reach at the venue of interview much before the schedule. This will help the candidate to settle down, relax and freshen up before the actual interview.
- d) **Certificate folder:** Certificates relating to work experience and education should be arranged in the reverse chronological order. It should be kept handy while entering the interview room so that it can be easily given to the interviewer when asked for. He should collect all his papers and certificates after the interview.
- e) **Body language:** Candidate should display confidence through his body language. He should avoid stiff body and broad smile as they display over confidence and also tension. He should be relaxed and have a pleasant facial expression. He should take his seat only after the interviewer instructs to do so. The candidate should maintain eye contact with all the interviewers. He should use polite language. He should greet the interviewer after entering and before leaving the room.
- f) **Exit:** After the interview is over, the candidate may ask for a feedback. After coming out of the room he should avoid sharing all details of the interview with other candidates.

7.9.3 Presentation

Please refer to the point 7.4 Presentation Skills.

Check your progress

- Q.1. Explain ways to be influential in a group discussion.
- Q.2. Provide guidelines to prepare an effective resume.
- Q.3. Discuss the preparation to be made for an interview.

7.10 LEADERSHIP SKILLS AND SELF IMPROVEMENT

Leaders show their team the way to work. He is the source of inspiration and encouragement to the followers. They lead by example. He is held responsible for the entire team's success as well as failure. A team with a dynamic and envisioned leader has higher success rates. Leaders are creators of good teams. It is said that one is born to be a leader. However if a person polishes his qualities and develops right attitude and skills he can grow to become a leader from any stage of his life.

Leadership is a process of social influence, which maximizes the efforts of others, towards the achievement of a goal.

A leader plays several roles according to requirement of situation; he is a task manager, arbitrator, listener and ideology maker. He is the identity of the followers. From personality, behaviour, attitude and skills everything is important to become a leader and maintain that position.

7.10.1 Characteristics of effective leadership

Leadership skills refer to special characteristics of an effective leader. Leadership when forced upon the followers does not command respect. People follow the leader only out of fear or certain obligation. Effective leadership leads to progress of the whole unit, be it a country, a sports team or an enterprise. Following are the characteristics of an effective leader:-

1. **Initiative:** Many people have plans. However only those can become leaders who take the first step to make their ideas come in reality. A leader shows the way things have to be done to his team.
2. **Vision:** Leaders have plans and they know where they want to take their team. In the vision it is not only how he leads the way, but how he prepares his team and they together achieve the goal as a team. He should build confidence among the members in the vision and make them realise that each one's effort will be counted in achieving it. The leader should be focused and passionate about the development of his team.
3. **Communication:** A good leader communicates with his team members. He proposes plan, takes opinions and let

others express themselves, even if it means disagreeing with him. He does not impose decisions but explains his decisions to his team members. He informs members of their roles in the team. Communication helps built trust and confidence between the leader and his team. He should be able to hold the team together by helping all members to gel with each other.

4. **Administrate:** Leader is also the manager of the team. He plans, organises, controls and directs the resources of the team.
5. **Decision making:** A leader should analyse all factors before taking decisions. In times of emergency the team looks up to the leader or immediate action plan. He should be able to handle pressure and take quick decisions in such situations.
6. **Persuasion:** A good leader uses persuasion to create his influence. He gives demonstration of his skills, builds strong image of his vision and creates confidence among the team members by positive talk, rewards and by showing trust. A leader who uses force or coercion to establish his influence is not an effective leader.
7. **Innovation:** A leader should develop new ways to deal with new problems. He should take risks to help the team achieve its goal.
8. **Values:** A leader with a weak moral base is undesirable by the team. Leaders have power in their hands. This power can shake the values of the leader. However a person with strong guiding principles can deal with any such situation with integrity. The team members trust their leader for their wellbeing. Effective leadership demands accountability to the team members and transparency in decision making. He should be trustworthy. As respect beets respect, he should respect every team member for their qualities. He should be compassionate with them. An understanding leader has few misunderstandings in his team.
9. **Responsibility:** Leaders have the responsibility of the entire teams' working. This means they have to take responsibility of not only their success but also failure as a team. This means while he should accept that something better could

have been done and mistakes were made. He should find ways in which the members realise their mistakes and act upon them positively. He should also appreciate team members for their efforts and motivate them to keep their spirits up even after failure.

10. **Development:** A leader should devise such methods and techniques which will help each team member to understand their capabilities and perform to the best of their abilities. He should be able to identify weak members and help them get rid of their weaknesses.

7.10.2 Styles of leadership

There are as many styles of leadership as there are leaders. Each leader develops his own way of leading his team depending upon his nature, philosophy and ideas. By analysing important and influential leaders around the world, experts have identified certain styles of leaderships. A few of the important styles are discussed below:

1. **Autocratic Leadership:** Autocratic leaders use force and coercion to influence the followers. They control all resources and centralise all powers in their hands. They do not consult others while making decisions. The subordinates do not have the power to question the decisions of the leader. Followers remain in fear of the leader and lose respect for him.
2. **Bureaucratic Leadership:** Leaders who follow the given rules strictly, belong to this style. They do not use their own ideas nor do they consult anybody before making decisions. They do not take responsibility for their actions and blame the system for any failure. Followers do not have respect for such leader and often become irresponsible towards their work due to the attitude of the leaders.
3. **Participative Leadership:** The leader shares information with the team and invites suggestions and opinions. His decision remains final but he involves the members in decision making process. Such leadership builds a strong informal relationship among the team and its leader. Confidence shown by the leader in the members helps them perform better and feel a sense of responsibility. Such

leadership can be successful only when the leader is influential enough to maintain control.

4. **Laissez Faire Leadership:** In such leadership the leader adopts the “leave it to them” attitude. Such leaders allow the team members to work according to their ways. He remains more of a guide, to coordinate the entire team and keep all members in sync with each other. The authority to make decision, solve problems is given to the team members. However the responsibility of the decisions is shared by the leader and the team.
5. **Paternalistic Leadership:** Leaders who consider their team as a family. The relationship between the leader and the followers is very informal. Mostly all decisions are taken by the leader. He may or may not consult his followers. This style of leadership works successfully in organisations with less number of members.
6. **Sociocratic Leadership:** For Sociocratic leaders the interest of the members is more important than the interest of the organisation. All decisions are taken by the leader after consulting the members. They tend to encourage good teamwork and creative collaboration.
7. **Neurocratic or task oriented Leadership:** For task oriented leaders the task or goal of the organisation is more important than any other factor. He may not consult the members if he does not feel the need. Such leaders do not take into consideration the interests of the members. He may also thrust the entire responsibility of the failure of a task on the members.
8. **Charismatic Leadership:** Leader with impressive personality, great oratory skills and good networking skills attract lot of followers. Their energy and enthusiasm inspires the team members. Charisma sustains followers support only if it is supported by decision making capacity and intelligence. Also if the leader gets over confident and egoistic because of his charisma then he may not think in the best interests of the team.
9. **Situational of transformational Leadership:** This is a combination of several positive style of leadership. The

leader is accommodative, shares information and takes decision after consultation with the team. Depending upon the intensity of the situation he may take complete control of all resources or may let the team members decide for themselves. Such leaders aim at effective task management, shared responsibility and also motivate the members for better performance.

7.10.3 Team building

Team building is the process of developing effective teams. It refers to the process of forming new teams as well as formatting the earlier teams for better results. Team building is the process of creating a cohesive group of people who work together towards a common goal by sharing ideas and efforts. Teams may be created for long term that is for continuous work over a long period, or for a short term in order to achieve temporary goals. Whatever the purpose or tenure of the team may be, essential factors for the creation and success of the team are fundamentally the same.

A. Stages in team building

Keith Davis formulated a five-stage team building process. Following are the stages of this process:

- 1. Identification of problem:** The very first step is to identify the problem for which the new team is to be created. Depending upon it, members can be chosen and resources can be allotted. If the team exists then identifying issues which are hindering smooth functioning of the team is important. It should be brought to the notice of all members and suggestions should be invited to solve it.
- 2. Collection of data:** The newly created team should collect all data possible related to the given task. In case of an existing team, members provide relevant data relating to the problem. A guide, internal or external helps them to survey all sources for data.
- 3. Analysis of data:** The team members analyse the collected data. The entire team works together. Each member is assigned a particular part of the task. Members are encouraged to think from new point of view and avoid mistakes done earlier.

4. **Resolving the problem:** At this stage, a solution is sought to the problem based on analysis. Viewpoints of all members are taken into consideration. It leads to a win-win situation to the conflicting parties. The group members get a new experience in problem solving. They may come across new data or find out areas which lacked efforts. This increases their confidence.
5. **Action:** The members take suitable actions to put back their team in good performance. Team building process results in high morale of the team and boosts cooperation among them. Some members may be replaced or new members may be added at this stage to give a fresh start to the team depending on the requirement of the goal. The process helps team members to identify potential areas of development in the team.

B. Significance of team building

1. Team building process increases the morale of the team. It brings back the confidence of the team members.
2. It leads to better cooperation among team members. Teamwork thus enhances.
3. Team acquires a new approach towards identifying and solving problems.
4. Team members' achieve higher job satisfaction.
5. The process leads to higher efficiency of the organisation and better use of its resources.
6. It leads to higher level of trust and support in the organisation.

Check your progress

- Q.1. What is Leadership? State the characteristics of effective leadership.
 - Q.2. Explain the various styles of leaderships with suitable examples.
-

7.11 SUMMARY

Effective communication is a very important element at personal and professional level. Good communication skills can help a person to move up in the social and professional ladder more smoothly. Good communication reduces the chances of misunderstandings and conflicts and helps greatly at workplace. Bodily gestures and other non verbal means of communication pass on very important message and plays crucial role in interpersonal relations. We have also discussed in the above chapter the guidelines to prepare for an interview, how to prepare a resume, how to be effective in group discussion and at the interview. The importance of good communication skills, written, unwritten, verbal, non verbal for all these was discussed in greater details. The good leadership qualities are essentials for professional success in every field.

7.12 UNIT END QUESTIONS

- Q.1. Effective listening is important for effective communication. Do you agree? Give reasons.
- Q.2. Write a note on oral communication.
- Q.3. State the advantages and disadvantages of written communication.
- Q.4. Write notes on the following:
1. Paralanguage
 2. Body language
 3. Advantages and disadvantages of non verbal communication
- Q.5. Explain the meaning and importance of self awareness.
- Q.6. State the importance of body language in effective communication
- Q.7. State the advantages and disadvantages of informal channel of communication.

- Q.8. Explain the importance of Statement of Purpose.
- Q.9. Discuss the ways to make formal application impressive
- Q.10. How is team building beneficial to an organisation?
- Q.11. Describe the process of team building.



QUESTION PAPER, FOUNDATION COURSE - III,

Paper- II

Time: 2½ hrs.

Marks: 75

- Note :** 1) All questions are compulsory.
2) Figures to the right indicate full marks.

- Q.1A) Explain the following concepts :(Any-5) (15)
- | | |
|----------------------------|----------------------------|
| 1) Political Rights | 2) Child labour |
| 3) Prevention of Disasters | 4) Mitigation of Disasters |
| 5) Myth | 6) Technology |
| 7) Oral Communication | 8) Self Awareness |

OR

- B) Write a comprehensive note on the Foundation Course (Sem-III) project submitted by you
- Q.2) How are the Human Rights of Scheduled Castes violated? Explain the laws that protects their rights. (15)

OR

In what way do rights of disabled persons violated? Comment on the laws that protects their rights.

- Q.3) Which are man-made disasters? Explain its effects. Suggest various measures to be taken before and after man-made disasters. (15)

OR

Discuss the various Human Rights issues in addressing disasters. Give relevant examples.

- Q.4) Explain in detail about 'Development of Science in Ancient Cultures and in the Classical era'. (15)

OR

Discuss the positive and negative impact of modern technology on human life.

- Q.5) What is communication? Explain the advantages and limitations of Verbal Communication. (15)

OR

Define the term 'Presentation'. Explain about various elements of presentations.

