UNIVERSAL HUMAN VALUES AND PROFESSIONAL ETHICS

JESHNA GOEL

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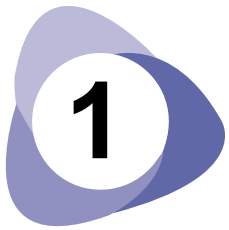


Human Values

Morals, Values and Ethics – Integrity – Work Ethics – Service Learning – Civic Virtue – Respect for others – Living Peacefully – Caring – Sharing – Honesty –Courage – Value time – Co-operation – Commitment – Empathy – Self-confidence – Spirituality- Character.

1.1 Morals, Values and Ethics

(i) Morals

Morals are not qualities. They are the attributes of a person, but outside his or her control. It is understood to be those, that makes a person purely “good”.

The discipline dealing with what is right or wrong or with moral duty and obligation are,

a) A group of moral principles or set of values.

b) A particular theory or system of moral values.

c) The principles of conduct governing an individual or a profession, standards of behavior.

Moral is concerned with the principles of right and wrong behaviour. Very often the terms 'morality' and 'ethics' often used interchangeably and closely related, but it is essential to identify the differences between these two with respect to the study of ethical matters. Morality tends to be more general and prescriptive. Because of this, the notions about manners, tastes, customs and even laws, may be considered ethical beliefs, but they are not always part of a moral code. When ethical views contradicts with moral beliefs, morality must prevail, because moral beliefs are generally far more general and basic.

Being immoral is completely different than being unethical. A person may behave unethically on occasions and certain circumstances, but to be immoral is to posses some fundamental, if not permanent character flaws, that render one untrustworthy in most of the occasions.

There are ways and means to acquire moral beliefs. The following six ways are helpful in acquiring moral beliefs.

1. Authority

2. Logic

3. Sense experience

4. Emotion

5. Intuition and

6. Science.

If anyone is directed to obey parental authority in one's childhood ages, he/she will generally feel it convenient to accept other authorities in later years. As far as majority of the people are concerned, parental authority is their first exposure to subordinating personal desires to some other's influence. If anyone learns to control the desires of somebody else, he further can substitute other influences for parental authority in later periods. Other ability to respond to any kind of moral guidance is relying upon their ability to control their own actions.

Moral development need not be linear in nature. Moral philosophers are in a view that moral theories and moral actions are the necessary parts to be a human.

(ii) Values

Value or worth seems to have its origin in economics, eventually it was applied analogously to other aspects of life, human values as such.

Value makes actions, characters, traits and objects of anyone good or bad. Evaluating the moral qualities of people or actions and their non-moral characters enviably raises the qualities of the nature or source of those value.

It consists of two possible forms: The first and the simplest one provides a list of values, such as courage or beauty, honesty and compassion. The second tries to answer what exactly is known by beauty or courage or friendship. It may seem to be relatively easy to compile a list of different values, but difficult to answer the second part of the question. Because, the list of values may change from time to time and culture-to-culture. One cannot estimate whether the particular values are useful or not, if not one knows the nature of value in general.

Values are taken from life, environment, from self, society and culture and, beyond all, from the ideal, transcended dimension of human existence and experience. As per the opinions of psychologists and social scientists, values are mere preferences and aversions as, desirable goals, emotions and interests.

The unity and transcendence of the value system, grounded in both human actualities and human possibilities, are seldom envisaged by the sciences of man, society and culture. Values and the process of valuation and development of the value system are analyzed in strikingly divergent and

piecemeal manner by the various psychological, social and philosophical studies according to their image of man and their conception of human nature and destiny.

With the aid of values, man delays his satisfactions and sets his mind and behaviour to distant and sometimes unrealizable goals, strivings and ideals. His value judgment enables him to select between alternative courses of behaviour and solve chronic inner tensions and conflicts by accepting standards and demands that control him from beyond.

Human values emerge due to two factors.

• The impingement of society and its meanings and norms on the fulfillment of the individual's needs or drives.

• The introduction of his own awareness, choice and judgment.

These two processes are interdependent. Values are essentially social products and at the same time involve the Individual's assumption of certain common goals and purposes of the milieu that have become a part of him.

Thus values may be defined as stable, regulative, future-oriented patterns of expression of formalized social life in its relations to man, society and world.

Individuality or integrity, openness or affiliation, integration or unity of transcendence of freedom are the polar attributes of human nature and development which characterize all human values.

The process of valuation starts at the biological dimension of health, efficiency, well-being and security. Here the generic values are life-maintenance and enhancement and the values are wealth, status, equality and justice. It then reaches out and fastens upon potential wholeness, balance and serenity and the realization of being at the ontological or transcendent dimension and the values here are truth, beauty, love, harmony and holiness.

The principal branches of human learning are biology, psychology, social science, ethics and metaphysics which can show multi-dimensional frames of human values. Their findings and explorations now need to be organized into a coherent, general theory of values for the guidance of man, society and civilization.

Values are indispensable, encountered by man everywhere and in all thoughts, relations and actions, no matter what he thinks or believes or how he responds to his fellowman, society and cosmos. Values are subjective, laden with feelings and flexible and at the same time objective, rational and regulative.

'Ethics' generally refers only to professional behaviour.

'Morality' refers to any aspect of human action very often.

`Values' are principles of some one's being good or bad.

Giving respect to others, good listening, sincerity, admiring good actions of others, understanding the responsibility, expressing views, projection of individuality are the values which help any individual to come up in life.

Universal values

- Responsibility
- Commitment
- Integrity
- Patriotism

One of the most important characteristics of moral judgments is that they express human values. Not all expressions of values are moral judgments, but all moral judgments do express the value of human beings. Thus, understanding morality requires investigating what people value and why.

There are three principal types of values which humans can have.

- Preferential values
- Instrumental values and
- Intrinsic values

Each plays an important role in lives of people, but these values don't play equal roles in the formation of moral norms and moral standards.

Preference value, the expression of preference is the expression of some value people hold. When people say that they prefer to play sports, they are saying that we value that activity.

Instrumental values are values like politeness, persistence, courage, ambition etc. They are not the end but a mean of achieving terminal values.

Intrinsic value—Something which has intrinsic value is valued purely for itself - it isn't used simply as a means to some other end and it is not simply "preferred" above other possible options.

This is a concept which regards the subject under consideration, as having some value in its own right, independent of any value placed on it by humans.

(iii) Ethics

Ethics is a set of moral principles. Ethics is the scientific involvement and demonstration of morality.

Some universally accepted ethical standards are as follows.

a) Ethical standards are helpful in understanding and resolving moral determines.

b) They are useful in justifying professional obligations and ideals.

c) They are useful in expressing everyday moral experience and justifying the professional morality.

The word ethics is derived from the Greek word 'ethos', referring to the philosophical science that deals with the rightness and wrongness of human actions. Ethics refers to most important beliefs and values of an individual and/or a society. These beliefs help to shape the character of the people in that society, teaching them what is good and bad.

In general, ethics refers to an activity an area related to inquiry. It is the task of understanding moral values, resolve moral issues and justify moral judgments. It may also be referred as discipline or an area of study dealing with good or bad with moral duty and obligation. Ethics is the study of codes of conduct and moral judgment: it is the study of the moral characteristics; the system or moral codes of a particular person, religion, group or profession.

The study of ethics can offer some understandings of basic ethical principles and strategies of moral reasoning that can be used in debate in support of moral issues positions.

Universally accepted ethical principles

Honesty, integrity, fulfilling commitments, abiding by agreements, being fair and open minded and willing to admit mistakes, being varying and compassionate, having respect for human dignity, response be pursuit of excellence and being accountable for one's decisions and their consequences are called ethical principles.

It is concluded that ethics have got several meanings which are given below.

• Ethics is an activity and area of inquiry.

• When ethics is referred to some ethical problems, issues and controversies, it tries to distinguish them from non-moral problems.

• Ethics refers to the particular kind of beliefs, attitudes and certain habits that any group can exhibit with moral concerns.

• Ethics can be used as synonyms for "morally correct" often at the very outset.

Moral values

Moral values are personal, not only because a person has them, but also because they are the expression of each one’s unique personality in the innermost center of one’s being.

Example: Two husbands have wives afflicted with a lingering and in a disease. Both families are alike, five children, moderate income, no hope of remedy.

One husband does his best to be both father and mother to the children, works overtime to pay for his wife's care and spends what time he can be with her to brighten her days.

The other man decides that he has enough, deserts wife and children, gets work in a distant city and is not heard of again.

We make our judgment, we have to approve the first husband and we condemn the action of the second as morally wrong.

1.2 Integrity – Work Ethics – Service Learning

Integrity

Integrity is one of the most important virtue terms. Integrity relates to general character or quality of a person.

A number of accounts of integrity being,

- Integrity as self integration.
- Integrity as maintenance of identity.
- Integrity as standing for something.
- Integrity as moral purpose.
- Integrity as a view.

Work ethics

The work ethics is a cultural norm that advocates being personally accountable and responsible for the work that one does and is based on a belief that work has intrinsic value.

Elements of work ethics are,

- Interpersonal skills
- Initialize
- Being dependable

Work ethics is the discipline aimed at understanding the moral values that ought to guide all professional practices including engineering, medicine, law and other practices. But the engineering ethics refers to the set of specific moral problems and issues related to engineering profession only.

Various disciplines of work ethics are,

(1) Personal ethics:

• Personal ethics is concerned with the rules by which an individual lives his or her personal life.

• It also clearly explains how we treat others in our day-to-day life.

(2) Business ethics:

• Business ethics is concerned with truth and justice and has a variety of aspects such as the expectations of society, fair competition, advertising, public relations, social responsibilities, consumer autonomy and corporate behavior.

• It involves choices on an organization level rather than a personal level.

(3) Engineering ethics:

• Engineering ethics is concerned with the rules and standards governing the conduct of engineers in their role as professionals.

• It is a body of philosophy, guiding the ways that engineers should conduct themselves in their professional capacity.

(4) Medical ethics:

• Medical ethics is concerned with the rules and standards governing the conduct of doctors and other medical practitioners in their role as professionals.

(5) Legal ethics:

• Legal ethics is concerned with the codes that guide the professional conduct of lawyers, judges, etc.

(6) Accounting ethics:

• Accounting ethics is concerned with the codes that guide the professional conduct of accountants.

Service learning

Service learning is a teaching and learning strategy that integrates meaningful community services with instruction and reflection to enrich the learning experience, teach civic responsibility and strengthen communities.

1.3 Civic Virtue – Respect for others – Living Peacefully

Civic virtue

Civic virtue is morality or a standard of righteous behavior in relationship to a citizen's involvement in society. An individual may exhibit civic virtue by voting, volunteering, organizing a book group, a public-oriented meeting.

Civic virtue helps people understand their rights to the community and their responsibilities with it. In many ways, an educated citizen who possesses civic virtue is a good public.

Types of virtues:

The various specific virtues can be grouped into four categories.

1. Self-direction virtues

2. Public-spirited virtues

3. Team-work virtues

4. Proficiency virtues

Self-direction virtues:

These virtues are those, that are fundamental in applying moral autonomy and responsibility.

Examples: Self understanding, humility, courage.

Public spirited virtues:

These virtues are those that are focused on the benefit of clients and the society. These virtues are commanded by the needs of the community. Three important public-spirited virtues are,

1. Justice

2. A server of community

3. Generosity

Team-work virtues:

These virtues are those, that are very essential in performing one's professional work successfully with others.

Examples: Collegiality, co-operativeness, loyalty to employers.

proficiency virtues:

They are also known as intellectual virtues, that are due to one's mastery over the profession through knowledge and technical skills.

Examples: Competency, diligence, creativity.

Respect for others

In general, respect means valuing one's colleague for their professional expertise and their devotion to the social goods.

Living peacefully

Living peacefully is not only individual but collective. Living in peace is collectively essential if something meaningful is to be achieved out of meetings, gatherings and organizational and institutional activities.

1.4 Caring – Sharing – Honesty

Caring

Caring means feeling and exhibiting concern and empathy for others. It also means feeling or showing care and compassion to others. Caring is the essence of moral life. Caring involves feelings, relationship, contends with other persons and protecting others and causing least damage to others.

• Having or showing warmth or affection.

• Feeling and exhibiting concern and empathy for others.

• Caring is a process and product which incorporates sharing, supports and respect. It encompasses the unity of mind, body and spirit of the holistic person with the broader content of one's environment.

As a normal human being when an individual is dealing or moving with neighbours, friends, colleagues, even with their family members, they must have some interests about the welfare of the other persons at least to some extent. This type of caring is essential in the work place too. Caring for others and having interest in the solution of their grievances will definitely bring in a good work environment. This type of adjustment among the workers or between the executives and subordinates in the work spot is also necessary for the successful implementation of the workload assigned. This type of morality of care, leads to concentration rather than impartiality and justice. The individual with justice orientation and caring in any dispute will be interested only on the fair thing to do and then proceed to follow up the course of action without bothering about the impact on others. But the individual with care orientation will try to identify the best course of action that preserves the interest of all those people involved.

Even actions taken by such care-orientated people will have least amount of damage to the relationships among the persons.

Sharing

Sharing means sharing of feelings, ideas, profits, resources and thoughts. Sharing is always mutually beneficial. Sharing morally acceptable feelings, resources and materials is a value.

Knowledge sharing is an activity through which knowledge (namely information, skills or expertise) is exchanged among people, friends, families, communities or organizations.

Organizations have recognized that knowledge constitutes a valuable non-physical asset for creating and sustaining competitive advantages. Knowledge sharing activities are generally supported by the knowledge management systems. However, the technology constitutes only one

of the many factors that affects knowledge sharing in organizations such as organizational culture, trust and incentives.

The sharing of knowledge constitutes a major challenge in the field of knowledge management because some employees tend to resist themselves without sharing their knowledge with the rest of the organization.

Honesty

Honesty means expressing one's true feelings. It is all emotional intelligence, which gives the ability to accurately identify our feelings. A society in which people are totally honest with each other would be difficult to tolerate.

The requirement of total honesty would mean that the people would have to be mutually frank with one another about their opinions and be unable to exercise the sort of tact and reticence that we associate with polite and civilized society.

Honesty is the human quality of communicating with a truthful, direct and complete intent. It is related to truth as a value.

Honesty means simply, stating facts and views as best one truly believes them to be. It includes both honesty to others and to oneself and about ones own motives and inner reality.

Engineering profession resembles with the construction process of a structure or building-honesty being its foundation. The value of the engineering services depends on honesty. Unreliable engineering judgment will be the worst. Rather it is better to be with none at all. Honesty also refers to the maintenance of truth or not to misuse the truth. Misuse of truth may indicate failing to communicate the truth also. Communicating the truth when actually they are not supposed to be informed and allowing the judgment with respect to the truth to be corrupted are also an act of misuse of truth.

(a) Lying:

Honesty means to avoid lying also. Lying may be of any type, for instance, an engineer by mistake communicates some test results on a sample testing. Actually lying means a person happened to be intentionally with less knowledge or less awareness, communicating wrong or misguided information. But of course, even in such incidents complications may arise. To be honest, an individual should not give information that he believes to be false even though it is actually true. Even gestures and nodding and some other indirect statements may also bring false statement or meaning during conversation, even though the individual has not said any lie.

(b) Deliberate deception:

Sometimes an engineer may discuss some matters on technical aspects in such a way implying knowledge, which he does not have to impress an employer or a customer. In that case, that engineer is definitely engaging in deliberate deception though he is not lying.

(c) Withholding the information:

Sometimes people hide certain information in conversation. Although it is not a matter of lying, it is another type of deceptive behaviours. Suppose an engineer during the proposals to his executive, fails to indicate some of the negative aspects of the project, he gets involved in serious deception, even though he is not lying. So dishonesty may be considered as a form of omission if anyone fails to pass on the information that his superior or his subordinates would reasonably expect; and such information should not be omitted.

(d) Adequate promotion of dissemination of information:

Sometimes an engineer may involve himself in planning for protection of the public health and safety. In such cases the obligation of the engineer is to ensure the maximum possible effect to disseminate the information regarding safety and health of the public. For instance, in situations like earthquake, tsunami, fire hazard, infectious diseases. Affected people in those areas must receive the information well in advance for the purpose of avoiding a disaster. Failing to develop the dissemination of such communication is also a false and dishonest.

(e) Seeking of the truth:

The most honest engineer is the one who is involved in searching and locating the truth not merely to avoid dishonesty. It would not be fair to assume that lying is a serious mistake than deliberate dissemination, withholding information, not adequately promoting the dissemination of information or failing in search of truth.

(f) Maintaining confidentiality:

Engineers should not get interested in disclosing or discussing some confidential information without the knowledge or consent of the clients. Mostly such confidential information may be either, information to the engineer by client or findings by the engineer during the process of the work carried out by the client.

(g) Permitting any judgment leading to corruption:

Professional judgment is an important part of any type of professional services. At times, these judgments may be corrupted or unduly influenced by certain conflicts of interest or some extraneous factors. This attitude is also another kind of misuse of truth. Some occasions, engineers in the design process may submit specification of minute equipment. Though the equipment is of good quality some later developments and innovations related to that equipment might actually be better for the effective functioning. But when the engineer makes use of an idea of a company proposed by any particular individual who is known for so many years by the company, the engineer may be correct and honest in certifying the company but he is not giving his employer the benefit of the latest innovations. Thus he makes unbiased professional judgment. This may also be considered as a form of dishonesty.

Truthfulness and trustworthiness are the two major aspects of honesty. Each one relies on the other or in other words, truthfulness is most essential to being worthy.

Honesty normally includes the activities like—not liking, not stealing, not involving in bribes and kickbacks. In simple words, it refers to paying respect to the property of others.

1. Honesty in beliefs: It denotes intellectual honesty i.e., forming of one's beliefs without self-deception.

2. Honesty in speech: It refers to the action of not deceiving or not intentionally misleading others. For instance, acts like pretending, manipulating somebody's attention, intentionally lying, misleading and withholding some pertinent information which someone or the client has to know.

3. **Honesty in act:** It means that the individual should not steal or manipulate accounts or get bribes and kickbacks.

4. **Honesty in discretion:** It means that an employee should not interfere with the decisions of the employer or the client. He should not interfere with the confidential matters.

Thus, honesty being the basic virtue for those people who engage themselves in the relationships with other employers and clients.

Honesty on campus

Similarly honesty on campus is also an important matter to train the students on the study of ethics. They must be very cautious in making use of the literature survey, which they have made for thesis presentation or fabrications of products or models. New ideas and reports can also be heard that there has been substantial increase in the most serious types of cheating, during examinations. It is found out that the experience of the students in engineering colleges is basically a training period for their professional careers. So part of this training programme must be in the area of professional honesty and ethics.

In general the dishonest attitudes expected from the professional students are forgery, trimming data; plagiarism and multiple authorship in publications could raise, particularly sensitive issues, with regard to honesty in scientific and technological work.

1.5 Courage – Value time – Co-operation – Commitment – Empathy

Courage

Courage is the ability and willingness to confront fear, pain, danger, uncertainty or intimidation. Physical courage is the courage in the face of physical pain, hardship, death or threat of death.

Courage implies self respect and governs confrontations with danger and risk. It is not excessive rashes or cowardice but it is the middle ground.

Taking risks and being bold in facing crises are the hallmarks of courage as a human value. It defines the mental make up of an individual in taking bold decisions even under adverse situations.

Valuing time

The first step in good time management is to understand the value of our time. If we are employed by someone else, we must understand how much the employer is paying for our time and how much profit he or she expects from us.

If we are working for ourself, we should have an idea of how much income we want to bring in after taxes. By working out these figures back to an hourly rate, this gives us an idea of the value of our time.

By knowing the value of our time, we should be able to tell what tasks are worthwhile to perform and also which tasks give a poor return. This helps us cut away the low value jobs or argue for help with them.

A short speech about valuing time:

This quote which is attributed to Bryan Dyson – Ex CEO of Coca Cola.

“Imagine life as a game in which we are juggling some five balls in the air. They are family, health, work, friends and spirit; and we’re keeping all of these in the air. We will soon understand that work is a rubber ball. If we drop it, it will bounce back. But the other four balls such as friends, spirit, family, health - are made of glass. If we drop one of these, they will be irrevocably scuffed, marked, damaged, nicked or even shattered. They can never be the same. We must understand that and strive for it. Work efficiently during office hours and leave on time. Also spend the time with our family, friends and have good rest. Value has a value only if its value is valued.”

Co-operation

Man cannot make his living all by himself. He has to depend on others for many things which is to be referred as the co-operation for successful completion of work assigned.

Co-operation is known as extending help to others for a good cause. Co-operation may be through an idea, an assistance, a suggestion or physical work which extends to others for common benefit.

Commitment

Every individual when grown up has to perform their duty, not only for his livelihood but also for the betterment of social and national condition. This is referred as commitment.

Empathy

The ability to imagine oneself in their place and understand the others feelings, desires, ideas and actions.

In another words, empathy is the ability to mutually experience the thoughts, emotions and direct experience of others. The capability to understand another person's circumstances, point of view, thoughts and feelings is empathy. When experiencing empathy, we are able to understand someone else's internal experiences.

1.6 Self-confidence – Spirituality- Character

Self-confidence

Self-confidence is very necessary for undertaking and completing any worthwhile job. It is very essential to complete the task easily.

Some factors that would shape the self confidence in a person are,

• Valuing oneself

• Perceptional traits

People with self-confidence feel that they are equal to others, even in the situations when others are in a position with better and greater formal power. The people with self-confidence also recognize the value of building the self-confidence of others and normally would not be threatened by doing it so. Thus self-confidence in everyone develops a sense of partnership, respects and accountability and helps the company to get maximum effort and ideas and guidelines from everyone.

Self-confident people have the following qualities,

(a) Have a self assured bearing

(b) Flexibility and willingness to change

(c) Easily giving others credit

(d) Not being afraid to tell the truth

Self-confidence is being referred to as an attitude, which permits individuals to have somewhat positive but realistic view of themselves with respect to the situations in which they get involved. Self-confident people trust their own abilities and have a general sense of control in their lives. They believe with reasonable limits that they can do what they wish, what they decide, like and plan with certain requirements.

Of course, it never means that self-confident people will be able to do anything or everything. Self-confident people have some expectations, which are realistic; even when such expectations are not met satisfactorily, they will continue to be positive.

But on the other hand people who are not having self-confidence rely more on the approval of others even in order to feel about themselves in good angles. As far as possible, they will avoid to take risks, as they are afraid of failures. Mostly they will be ideal or tend to ignore compliments given to them. But in contrast, self-confident people will definitely come forward to take up risks, as they generally trust their own capabilities.

The self-confidence need not be a general characteristic, which pervades in all aspects of a person's life. Some typical individuals like sportsmen, scholars and educationists will have certain areas where they feel quite confident. But at the same time, they may not feel quite confident in other areas like social services, public relationship and so on.

There are factors, which affect the development of self-confidence, like parents and elders attitudes to the feelings of children about themselves. Normally when elders give acceptance to the youth's emotions, they get a solid foundation of good feelings and recognition about themselves. But on the other hand, if the elders are critical or demanding and are over protective by discouraging the moves towards independence, youth may come to a belief that they are incapable or incompetent. This leads to inferiority complex. So to develop self-confidence, the elders should encourage the movements of the youngsters towards self-reliance, so as in jobs too.

It is an interesting factor that, lack of self-confidence is not exactly related to lack of ability. It is the result of emphasizing too much on the unrealistic expectations of others particularly elders and the society. At times, the influences of friends/colleagues can be much more powerful than those of parents and society in bringing feelings about one's self in the proper shaping, especially, like the college students who develop their own identities by the influence of their friends.

Strategies for developing confidence

Emphasize strengths:

For all attempts, credit must be given without emphasizing the end results. One should appreciate and applaud for the efforts taken and not emphasizing on the results of the end projects.

Taking risks:

It's better to enter onto new experiences as opportunities are given to learn and better rather than occasions to win or lose. This will open the new possibilities to increase "sense of self acceptance".

Self-talk:

It's better to use self-talk, taking it as an opportunity to counter harmful assumptions. For e.g., when any one wants to attain the expected perfections, it is better to remind himself that he

cannot do everything perfectly well and it is only an attempt in trying to do the things and so in trying to do them well. This trial permits one to accept himself while still striving for improvement.

Self evaluation:

In order to develop confidence one should evaluate himself independently. This makes oneself to focus on how he feels about his own behaviour, work, etc. and will give him a stronger "sense of self" and will thus prevent him from giving away his personal power to others.

Spirituality

Spirituality refers to the way of living. It emphasis a constant awareness of the spiritual dimension of nature. It is a sense of meaning and purpose a ‘sense of self’.

Spirituality can be of two kinds.

1.Religious spirituality

2.Workplace spirituality

Spirituality raises a man above the materialistic world into a realm where he finds peace and real happiness.

• Spirituality is, in a narrow sense, a concern with the matters of spirit, however that may be defined; but it is also a wide term with many available readings. It might include belief in supernatural powers, as in religion, but the emphasis is on personal experience. It may be an expression for life perceived as higher, more complex or more integrated with one's worldview, as contrasted with the merely sensual.

• Devotion to metaphysical matters, as opposed to worldly things." Another is "activities which lift up, renew, heal, comfort and inspire both ourselves and those with whom we interact."

• An inner sense of something greater than oneself. Recognition of the meaning to existence that transcends one's immediate circumstances.

This way of living also practices like meditation and bonding rituals, which support identity and relationship. Spirituality may also include certain beliefs in supernatural powers as referred to in religions. It is necessary to understand the meaning of religion and spirituality and their difference. Spirituality carries the connotations of the believer's faith, which is more personal and less dogmatic. Moreover spirituality is open to new ideas and myriad influences. But in work spot, spirituality is not the same as religion. Religion is something, which people can select as a choice or in other words, people can change religions later or in future. By so, people can even be non-religious.

If spirituality is properly understood and applied in a profession or work situations, then the profession becomes an ethical practice. This will not force any prescribed rules and regulations for

the workers of an organization because the workers follow spirituality in their profession. They will normally carry out their duties and know their responsibilities and dedicate themselves for the betterment of the organization. Therefore, spirituality in the work spot is a feeling at home and similar to the works that people have to do as a daily job with a greater level of comfort. Spirituality is something that people carry within themselves or sense for self-respect.

Character

Character is defined as “The combination of mental characteristics and behavior that distinguishes a person or group.”

• A distinguishing feature or attribute, as of an individual, group or category.

• The inherent complex of attributes that determine a person's moral and ethical actions and reactions.

• Moral or ethical strength.

• A description of a person's attributes, traits or abilities.

It is a known fact that people are not born with a character. Because character is a obtained by learning. A good character emerges due to the practice of proper behaviour and discipline. The combination of qualities like integrity, honesty, courage reflects the values and level of maturity of people. Hard work is also essential to build a sound character. Moreover the character of the people decides the quality of the organization.

2

Engineering Ethics

The History of Ethics-Purposes for Engineering Ethics-Engineering Ethics-Consensus and Controversy –Professional and Professionalism –Professional Roles to be played by an Engineer –Self Interest, Customs and Religion-Uses of Ethical Theories-Professional Ethics-Types of Inquiry – Engineering and Ethics-Kohlberg's Theory – Gilligan's Argument –Heinz's Dilemma.

2.1 The History of Ethics - Purposes for Engineering Ethics - Engineering Ethics

The known history of pure ethics or ethics theories began with ancient Greek philosophers and after them it was recovered by early English positivists and has been the main topic of discussions in the Medieval times in Europe.

As the scholastic doctrines are by-passed, we come to the illuminated times after the Medieval and continue with Hobbes, the Father of Modern Ethics. This kind of ethics is known by two logical methods: criticism and comparison.

After Hobbes, English and German schools of ethics have been differentiated. These led to English intuitionists followed by Utilitarians against Kantian ethics.

Throughout the 19th Century these ideas have been discussed very fiercely throughout Europe. Then Darwin, Comte and finally Spencer followed by Green came in, who set the evolution concept into physical sciences as well as the development of ethics. Thus at the beginning of 20th century ethics was more powerful with evolutionary concepts but still divided between Utilitarians and Kantians.

Immanuel Kant (1724-1804)

• Immanuel Kant is the most important name in modern ethics. He is a follower of both the Intuitionists and Naturalists. He underlines the importance of "duty" and "self-love" as two district motives.

• He says that the only absolutely good thing is the "good will". It is the principle of action that ought to be obeyed by all rational beings, under all circumstances and for its own sake. This principle of action is adopted by the person and not the laws which are independent of the person.

Kantian "Categorical Imperative" suggests that "A person should act on that principles and when everybody act like that the principles becomes a universal law".

Kant's definition of "Free-will" is based on the consciousness of moral obligations: "we ought, therefore we can".

Kant based his theory on three postulates of morality.

• The existence of God.

• The freedom of will.

• The immortality of the soul.

The particular duties as well as the general principles of morality can never be doubtful as they are known by rational intuition. He ascertains that,

– We can do what we ought to do, but unless we know what we ought to do we cannot do it.

– A conflict of duties is impossible.

– Motive determines the morality of the actions; not the effects.

• Kant's most important teaching is "morality of an action depends only on the motive and is independent of the effects on the person doing it or on the others".

Utilitarianism

• Utilitarianism is the doctrine that the ethical standard should be, "great happiness" of the greatest number. Its founder is Bentham (1748-1832) who was followed with Stuart Mill and Sidgwick.

• Bentham says that "Nature has placed man under the governance of two masters, pain and pleasure. It is for them to tell us what we ought to do, therefore, we shall do.

• Then the principle of utility comes into picture, to approve or disapprove every action with a value in itself, to increase or decrease the happiness of the party whose interest is in question.

• What is the measure of pleasure and pain?

For the personal pleasure,

(1) Intensity

(2) Duration

(3) Certainty

(4) Propinquity

(5) Tendency to be followed by other pleasures

(6) Purity

These are the criteria for the measure.

For the community it follows: (7) The extent.The seventh measure was brought to define the "equity" by Bentham. In his words "every one is to count for one and no more for more than one".

2.1.1 Purposes for Engineering Ethics

The purposes for engineering ethics are,

(a) To understand the moral values that ought to guide the Engineering profession.

(b) Justify the moral judgment concerning the profession.

(c) Resolve the moral issues in the profession.

It is intended to develop a set of attitudes, beliefs and habits that engineers should posses concerning morality. The prime objective is to increase one's capability to deal effectively with moral complexity in engineering practice.

2.1.2 Engineering Ethics

Engineering ethics may be defined as the identification, study and resolution of ethical problems occurring in the practice of the engineering profession.

Senses of engineering ethics:

• Engineering ethics is the activity and disciplines which is aimed at understanding the moral values that ought to guide engineering practice and resolving moral issues in engineering and justifying moral judgments that concerns engineering.

• Engineering ethics refers to the set of specific moral problems and issues related to engineering.

2.2 Consensus and Controversy

Consensus means agreement and controversy refers to disagreement. When an individual exercise moral autonomy, they may not be able to obtain the same results as other people obtain. There may be some differences in the practical application of moral autonomy that can't be altered either

by facts or errors in logical conclusions. This kind of controversies (i.e.,) disagreements are inevitable.

Moral autonomy could be comparable to a subject like morality which is considered to be not more clear or distinct as arithmetic problems. Similar view was also expressed by the great philosopher Aristotle before a few centuries back. It is reasonable to understand that tolerant quality could pave a way for differences of opinion among people.

Exercising moral autonomy is not as precise and clear-cut as arithmetic. Therefore, the moral disagreements are natural and common. In order to allow scope for disagreement, the tolerance is required among individuals with autonomous, reasonable and responsible thinking.

According to the principle of tolerance, the objective of teaching and studying engineering ethics is to discover ways of promoting tolerance in the exercise of moral autonomy by engineers.

In some way, the goal of courses on engineering ethics and goals of responsible engineering have some similarities. Both situations require, the need for some consensus regarding the role of authority.

The provision of moral autonomy to professional engineers is a fascinating concept of engineering ethics. When the modalities of ethical values are being implemented in practical terms, some consensus and controversial implications and issues arise. The harmonious interaction between engineers and managements and in turn between engineers and public individuals is the crucial factor for the manifestation of consensus and controversy.

The creation of a uniform agreement on ethical values is not the only purpose of teaching ethics of engineering. These views are also expressed by the principle of tolerance. These views can hold good, even if uniform agreement is accomplished by any of the studies that would harm the logics of moral autonomy. The similar concept of finding the proper ways and means for promoting tolerance in the practical applications of moral autonomy by engineers, should be strictly applied in the evaluated methods of teaching the engineering ethics despite the possibility for some conflict views of morality.

Proper provisions should be made available for teaching the essence of engineering ethics and the responsible engineering. Particularly, authority should be inducted both in classrooms of engineering teachings and engineer's work place. Authority of teachers on students and authority of managers on engineers, would much focus on the values of moral autonomy and ethics. A common line of agreement should be reached on the specific role of authority. More precautionary steps are need to be taken for not degrading and diluting the agreement by the strong emphasis of moral autonomy of individuals in expressing their moral views.

There are two important relationships between autonomy and authority. Care about the welfare of the people and respect for good moral values an the basic themes of moral autonomy. Moral autonomy highlights the capabilities and responsibilities of people. The framework that motivates and encourages the learning attitude is the primary theme of authority. Authoritative handling of classes by the academic teaching community is very vital to maintain the dignity and decorum of

academic climate in a institution. Authority would also help in restoring the confidence and respect between teaching community and students. The commanding authority exercised by faculty in controlling the students in a classroom is just equivalent to the commanding role of the conductor while directing the musicians in an orchestra.

Secondly, some specific problems may arise with regard to the basic applications of autonomy and authority. As a result of this, some differences of opinions among students and faculty members may also occur due to some inconsistent rules of a specific class. Open and frank discussion is the best remedial relief measure to avoid these problems. When the authority is wrongly exploited by means of abuses, conflicts may arise between autonomy and authority. To have a healthy atmosphere of academic curriculum, students should be encouraged by faculty to have discussions and clarifications of their subject doubts thereby infusing better confidence in their minds.

2.3 Professional and Professionalism –Professional Roles to be played by an Engineer

Engineering is a great profession which helps us to realize anything and everything in the world. Engineering gives homes and jobs to people and also it improves the standard of living.

The important and great liability of engineers when compared to other professions is that the work of an engineer is open to all and all can see the works done by an engineer. He can't hide his mistakes as doctors do. He cannot argue like a lawyer. He can not blame others for his mistakes like the politicians do. If his work is wrong, only he will be condemned by others.

In the modern world today, with the help of the mass communication and other facilities, the products of engineering are much out in the open, than the ancient period. There are also more number of engineers. But, inspite of their large numbers, they have become less visible to the public today.

The invisibility of the engineers makes it difficult for them to keep a sense of accountability and mutual understanding with the public. So the engineers must have some responsibility to do good to the public by their profession or as a professional.

Definition

The word 'Professional' gets different meanings based on the context. In general 'Professional' relates to any work that a person does for an occupation, especially the work which requires some special skill or training.

Profession means a type of job that requires special training and that brings a fairly high status. For example, work connected with medicine, law and education. Whatever may be one's profession one should exhibit one's professionalism, qualities that are typical or expected of a person in that profession.

Professionalism can be achieved by the following criteria:

1. Knowledge

The job/work must include complicated skills, theoretical knowledge a clear judgment and caution. Selection of a person to do a job requires some formal education, like humanistic studies as well as technical studies etc.

2. Organization

Some special societies or organizations must be created for the profession. These organizations and societies must be accepted by the public to set the standards for that particular profession, writing the code of ethics of that profession and also these organizations have to represent that profession to the public. For example, societies like IEEE, ISTE etc.

3. Public good

The job/work must help the public by doing them a favour as quoted in its code of ethics. For instance, medicine is for promoting health, law is for protecting the legal rights of the public and engineering towards improving the public's health, safety and welfare with the help of technological advancements.

To conclude, a job or a work or an occupation can be said to be a profession only when professionals have got all the above mentioned criteria, of late, only engineering, medicine, law and business administration can be called professions. The sanitation work, driving, sports can not be called professions as they are lack the above said criteria.

Models of professional roles

- Engineers as saviors
- Engineers as guardians
- Engineers as bureaucratic servants
- Engineers as social servants
- Engineers as social enablers and catalysts
- Engineers as game players

(a) Engineers as saviors

It is believed that engineers hold the key for any improvements in society through technological developments. Thus, people consider engineers as a savior, because they redeem society from poverty, inefficiency, waste and the hardship drudgery of manual labour.

(b) Engineers as guardians

Engineers know the direction in which technology should develop and the speed at which it should move. Thus, many people agree the role of engineers as guardians, as engineers guard the best interests of society.

(c) Engineers as bureaucratic servants

The engineers role in the management is to be the servant who receives and translates the directives of management into solid accomplishments. Thus, the engineers act as a bureaucratic servants. (i.e.,) loyal organization person, while solving problems assigned by the management, within his limitations set by the management.

(d) Engineer as social servants

As we know, engineers have to play the role of social servants to receive society's directives and to satisfy society's desires.

(e) Engineer as social enablers and catalyst

Besides merely practicing the management's directives, the engineers have to play a role of creating a better society. Also they should act as catalysts for making social changes.

(f) Engineer as game players

In actual practice, engineers are neither servant nor masters for anyone. In fact, they play the economic game rules, which may be effective at a given time.

2.4 Self Interest, Customs and Religion

Self-interest

In general, self-interest refers to a focus on the needs or desires of the self. A number of economic, psychological and philosophical theories examine the role of self-interest in motivating human action.

Enlightened self-interest is a philosophy in ethics which states that the persons who act further to the interests of others, ultimately serve their own self-interest.

Customs

As we live in a society which is of increasingly diverse nature, it is more important to have tolerance for the various customs and outlooks. Hence the concept of ethical pluralism emerges. It views that there may be alternative moral attitudes and that are reasonable. But none of the moral perspectives can be accepted completely by all the rational and morally concerned persons.

Ethical pluralism allows the customs which plays an important role in deciding how we should act. Moral values are varied and flexible. So these moral values allow considerable variation in how different individuals and groups understand and apply them in their day-to-day activities.

In other words, to be precise, the reasonable persons always have reasonable disagreement on moral issues including issues in engineering ethics.

Religion

Moral responsibilities and religious belief are intertwined in many positive ways. Firstly, they are related historically. Our moral views have been shaped by the most known central moral values within the major world religions.

For example, Islam has been having a great influence in middle east countries such as Saudi Arabia, Kuwait, Pakistan etc. Confucianism has been influential in China and Hinduism, Buddhism and Taoism have been famous in Asian countries.

Secondly, most of the people still have beliefs and show some important and inevitable psychological connections between their religious and moral beliefs. Religious views frequently support moral responsibility by providing additional motivation for being moral.

Religious hopes or faith in religions implies trust. This trust gives an inspiration to be moral. The fundamental social functions of religion is motivating right action based on ethical principles. Religion supports many number of people to follow their beliefs and promote tolerance and moral concern for others.

Thirdly, religions forms a set of higher level moral standards. For instance, Christianity suggests for loving neighbours. Many religions include virtue ethics stresses about particular virtues. For example, if Christianity focuses in the virtue of love, faith and hope, Buddhism emphasizes a feeling of pity. Islam pressures 'insane'.

Sometimes, religious sets standards below the level of acceptable moral standards. Some religions don't give equal rights to women as in Islam. In such circumstances, the conflict is not only between secular morality and religion but also among other religions.

2.5 Uses of Ethical Theories - Professional Ethic

Theories of rights action are philosophical concepts concerned with human nature and their rights and duties is to lead the life with ethical values. This concepts mainly focus on individual person's actions and their consequences.

There are different versions of rights action introduced by difference ethicists during the Eighteen-century, Enlightenment Era such as utilitarianism, rights, ethics and duty.

The different types of ethical theories are,

1. Virtue ethics theory

2. Right ethics theory

3. Duty ethics theory

4. Utilitarianism theory

(1) Theories about virtues

Basically virtue ethics is about determining what kind of people we should be. In virtue ethics one's situation and actions are considered, right if he holds good character traits and wrong if he hold bad character traits. Thus, virtue ethics is closely related to personal character.

The two basic old-good theories about virtues are,

i) Aristotle's theory of the "Golden Mean"

ii) MacIntyre's theory of virtue

(i) Aristotle's theory of the "golden mean"

Aristotle in his Nicomachean ethics, defined the virtues obtained habits. It allows an individual to employ effectively in activities that define him as a human being.

According to his theory, the virtue of wisdom or good judgment is highly essential for accomplishing the rational activities successfully. As per this theory, virtues or tendencies to find the "Golden Mean" between the extremes of excess and deficiency.

(ii) MacIntyre's theory of virtue

Alasdair MacIntyre, a contemporary ethicists, related the issues of virtues with the social practices, (i.e) co-operative activities that are aimed at achieving public goods. These public goods should not be related to external goods such as money and prestige.

(2) Theory of rights ethics

The rights ethicists emphasize that any action that violates any moral right is considered as ethically unacceptable. This theory holds that, those actions are good that respects the rights of the individual.

In other words, right ethics holds the people who have fundamental rights and that other people who have a duty to respect.

Two versions of rights ethics are,

i) Locke's version of rights ethics

ii) Meldon's version of right ethics

i) Locke's version of rights ethics

John Locke (1632-1704), a famous rights ethicists, argued that humans have human rights to life, liberty and the property generated by one's labor. His views of human rights ethics were considered as highly individualistic.

In Locke's view, rights are claims that prevents other people from interfering in one's life. These rights are referred as liberty rights or negative rights, that places duties on other people not to interfere with one's life.

ii) Meldon's version of rights ethics

A.I. Meldon (1910-1991) considered human rights as intimately related to communities of people. According to Meldon, moral rights requires the capacity to show concern for others and to be accountable within a moral community. Meldon also defined welfare rights as rights to community benefits, that is needed for living a minimum decent human life.

(3) Theory of duty ethics (respect for persons)

Duty ethics states that there are moral duties such as being honest, being fair to others etc, that should be formed regardless of whether these acts lead to the most good. Two versions of duty ethics are,

i) Kant's theory of duty ethics

ii) John Kant's modern theory of duty ethics

(i) Kant's theory of duty ethics

A major proponent of duty of ethics was Emanuel Kant (1724-1804), who regarded that moral duties are fundamental rather than good consequences.

In his view, ethical actions are those actions required by a list of duties such as,

- Be honest
- Don't cause suffering to other people
- Be fair to others
- Show gratitude for others
- Show kindness
- Don't commit suicide
- Seek to improve one's own intelligence and character
- Develop one's own talents, etc.

According to Kant, the above actions are our duties because they express respect for persons. They express an unquantified command for autonomous moral agents and they are the universal practices.

(ii) John paul's modern theory of duty ethics

According to Paul's, valid principles of duty are those that would be voluntarily agreed upon by all rational persons in an imaginary contracting situation.

Also Paul felt that placing a person in the imaginary contracting situation helps him to reason more easily and honestly about moral principles. It also enables him to check his intuitions and to set aside his biases.

(4) Theory of utilitarianism

Utilitarianism seeks to produce the most utility. Utilitarianism holds those actions or rights that produce the most good for the people.

Different version of utilitarianism

I. Act utilitarianism

The act utilitarianism concept was developed by John Stuart Mill (1806-1873). The act utilitarianism focuses on individual actions rather than on general rules.

It is understood that most of the common rules of morality such as don't lie, don't steal, be honest, don't harm others, keep promises etc, are good guidelines to judge a human being.

But according to Mill, a person's actions should be judged based on whether the greatest good was achieved in a given situation. He also emphasized that even the general rules should be broken, if necessary to achieve the greatest good for the greatest number of people.

Mills view about 'Goodness':

As we know, the standard of right action is maximizing goodness. According to Mill, the term 'goodness' represents two things.

1. Intrinsic good: Intrinsic good is referred as something good in and of itself or desirable for its own safe. He felt that happiness is the only intrinsic good.

2. Instrumental goods: Instrumental goods are other good things that provide means for happiness.

In Mills view, the pleasures derived through intellectual inquiry, creative accomplishment, appreciation of beauty, friendship and love are inherently better than the bodily pleasures derived from eating, sex and exercise.

ii. Rule utilitarianism:

Rule utilitarianism differs from act utilitarianism in owning that moral rules are more important than an individual action. Richard Brandt proposed this version of utilitarianism.

According to Brandt, though sticking to general moral rules such as don't lie, don't steel, be honest, don't harm others, etc, might not always maximize good in a particular situation, overall sticking to moral rules will ultimately guide to the most good. In Brandt's view, the rules should be considered in sets known as moral codes. The moral codes are justified only when they maximize the public good.

Uses of ethical theories

The three most important uses are,

• Ethical theories are helpful in understanding and resolving moral dilemma.

• Ethical theories are useful in justifying professional obligation and ideas.

• It is useful in everyday moral experience and justifying the professional morality.

2.5.1 Professional Ethic

Professional ethics is a personal and corporate standard of behaviour expected of the members of a particular profession.

Professional code of ethics

Many professions that are trusted by the public to apply expert knowledge have a code of ethics which sets out their expectations of a person's behaviour and the boundaries within which members have to operate.

A code of ethics helps us to clarify the profession's values provides a reference point for decision making and can be utilized as a framework for discipline. Most codes of ethics are principles based, providing guidance as to the principles on which decisions and professional judgement should be based, rather than a rigid system of rules.

There tend to be some general themes, so for instance AAT's code of ethics, like that of other professional accountants, sets out five fundamental principles which all the members should apply.

• Integrity

• Objectivity

• Professional competence and due care

• Confidentiality

• Professional behaviour

2.6 Types of Inquiry

The three types of inquiries are,

1. Normative inquiries

2. Conceptual inquiries

3. Factual inquiries

Normative inquiries

• Normative inquiries are useful to identify the values that guide the individuals and groups in taking a decision.

• Normative inquiries are meant for identifying and establishing the morally described norms or standards that are used as guide to assess something as good or bad.

• Generally, normative questions are about what ought to be? And what is good?

Some examples are:

• When and why the engineers have obligations to their employers, their clients and the general public?

• When should the engineers attempt for whistle blowing?

• Why must some engineering information kept confidential?

• What are the moral rights an engineer should possess in order to fulfill their professional obligations?

• How an engineer can protect the public safety in a given situation?

From the above questions, it is clear that the goal of normative inquiries is justifying many moral judgments.

Conceptual inquiries

•These inquiries are useful in clarifying the meaning of concepts, principles and issues in engineering ethics.

•In other words, the aim of conceptual inquiries is to clarify the meaning of key ideas and issues, possibly expression by single word or by statements.

Examples of conceptual inquiries:

• What is safety?

• What is meant by risk?

• How safety is related to risk?

• What is a bribe? When a gift becomes as a bribe?

• What is a profession?

Factual inquiries

Factual inquiries are also known as 'descriptive or exploratory' inquiries. These inquiries are helpful to provide facts required for understanding and resolving value issues.

Researchers and engineers use these inquiries to get various information such as the history of engineering profession, the effectiveness of professional societies in promoting moral conduct, the procedures used in risk-benefit analysis and psychological profiles of engineers.

The above-obtained information through factual inquiries provides an understanding of the background conditions that generate moral problems. And these factual inquiries are helpful in solving moral problems by using alternative ways of solutions. Thus factual inquiries are helpful in understanding the business, social and political realities in which the company operates.

Examples of factual inquiries:

• What are the laws enforced in the intellectual property rights law recently?

• What are the procedures used in making risk assessments?

• In what way, the 'code of ethics' of engineering societies inspires and guided the engineer's obligations?

• What is the validity period of a patented product?

2.7 Engineering and Ethics

Engineering is the profession in which the knowledge of the natural sciences and mathematics gained by study, experience and practice is applied with judgment to develop ways to economically utilize the materials and forces of nature for the benefit of mankind.

Ethics

Ethics is the word that refers to beliefs, values and morals of the individuals, family or the society.

The word has several meanings. Generally it is an activity and process of inquiry. Secondly, it is different from non-moral problems, when dealing with controversies and issues. Thirdly, ethics refers to a particular set of habits, attitudes and beliefs of groups, family and individuals concerned with morals. Fourth, it is used to mean 'morally correct'.

The study on ethics helps us to know the people's beliefs, values and morals, learn the good and bad of them and practice them to maximize their happiness and well-being. It involves the inquiry on the existing situations, form judgments and solve the issues.

In addition to this, ethics also tells us how to live, to respond to issues, through the obligations, responsibilities, rights and duties. In religion, similar principles are included, but the reasoning on procedures is limited. The practices and principles of religions have varied from to time to time, region, religion, society, language, creed and caste. But ethics has grown to a larger extent beyond the barriers listed above. In ethics, the focus is to study and apply the principles and practices, universally.

2.8 Kohlberg's Theory - Gilligan's Argument - Heinz's Dilemma

It is the ability to think critically and independently about moral issues and apply this normal thinking to situations, that arise during the professional engineering practice.

Lawrence Kohlberg's theory:

According to Kohlberg, the people progressed in their moral reasoning through a series of stages. His theory is based on the foundation that morality is a form of reasoning that develops in structural stages.

The three levels of moral development suggested by Kohlberg are,

1) Pre-conventional level

2) Conventional level

3) Post-conventional level

1) Pre-conventional level

The pre-conventional level of moral development is based on the desire to derive benefits for oneself. In the first level, individuals behave according to socially acceptable norms, that are taught mainly by parents and teachers.

At this level, individuals are encouraged mainly by their interest to avoid punishment or by that desire to satisfy their own needs or by the external power exerted on them.

This is the stage of development of all young children and some adults, who are unable to reach beyond a particular limit.

2) Conventional level

In the second level, the moral thinking and behavior of the individual are determined by the standards of their society, family and community. That is, the norms of customs of one's society/community/family are accepted and adopted as the ultimate standard of morality.

At this level, individuals are motivated by the desire to please others and to the social units expectations, without bothering much about their self-interest.

Thus, as per the second level, individuals give more importance to loyalty and close identification with others than their own self- interest.

The second level of worst thinking is found in society generally. That's why it is named as 'conventional of moral development'.

3) Post-conventional level

In the post-conventional level, the individuals are guided by convictions and strong principles, not by selfish needs or pressure from society.

According to Kohlberg, these individuals are called as 'autonomous', since they think for/by themselves and also they do not believe that customs are right always.

The people at this level wants to live by general principles that are applied to all people. They always desire to maintain that moral integrity, self-respect and the respect of other autonomous individuals.

Kohlberg fell that the majority of adults do not reach the post- conventional level.

Also Kohlberg believed that individuals could progress only through these stages one by one. That is, they cannot 'jump' the stages. He also pointed out that the people at post-conventional level have more moral development and hence the moral autonomy.

Kohlberg's levels of moral development		
Level	**Appropriate age range**	**Moral development**
Pre conventional	Birth to 9 years	• Self-centered attitude. • Willingness to avoid punishment. • Desire to gain reward.
Conventional	9 to 20 years	• Respect for conventional rules and authority. • Willingness to please or satisfy others. • Importance to loyalty and choose identification with others.
Post-conventional	Over 20 years or may be never	• Thinking for and by themselves. • Agreed upon universal general principles. • Personal moral stands.

2.8.1 Gilligan's Argument

Since Kohlberg's theory are male biased, Gilligan's refers her context-oriented emphasis on maintaining personal relationships as the ethics of care.

Gilligan's three levels of moral development are,

Pre-conventional level:

This is almost same as Kohlberg's first level. In this level individual is concerned with self centered reasoning.

Conventional level:

This differs from kohlberg's second level. In this level, Gilligan mentioned that women will not hurt others and have a willingness to sacrifice their own interests in order to help others.

Post-conventional level:

Principle of non-violence. i.e., do not hurt others or self. To balance between one's own needs with the needs of others.

Factor influencing the moral concern:

• Atmosphere in which person is brought up.

• One's relationship with friends and relatives.

• One's interaction with his neighbour.

• One's family structure and the family's economy.

• Influence of religions institutions.

• Influence of educational institutions.

• Influence of media and social events.

Comparison of Kohlberg's and Gilligan's theory

Level	**Kohlberg's theory**	**Gilligan theory**
Pre-conventional	• Behave according to socially acceptable norms. • Willingness to avoid punishment. • Desire to gain reward.	• Self centered attitudes.
Conventional	• Respect conventional rules and authority. • Willingness to satisfy for others.	• Self-sacrifice is goodness.

	• Importance to loyalty.	
Post-conventional	• Thinking for and by themselves. • Agreed upon universal principles. • Personal moral stands.	• Principle of non violence. • To balance between one's own needs with the needs of others.

Thus Kohlberg gives greater emphasis to recognizing rights and abstract universal rules, whereas, Gilligan stresses the importance of maintaining personal relationships based on mutual caring.

2.8.2 Heinz's Dilemma

Gilligan's criticism on Kohlberg's theory can be made very clear with the help of a famous example used by Kohlberg in his interviews and questionnaires. This is referred as Heinz's Dilemma.

This example was about a woman and Heinz, her husband, living in Europe. The woman was infected with a serious disease, cancer. The doctors told her to use an expensive drug to save her life. The druggist who also invented that medicine charged him with ten times the cost of manufacturing the drug.

Inspite of his poverty, Heinz took a lot of effort to borrow the money, but he could get only half of the amount needed. He approached the pharmacist and begged him to sell the medicine at a cheaper price or allow him to pay for it later. But the pharmacist disagreed to do so.

Eventually without any hope, Heinz forcibly entered into the pharmacy and robbed the drug. The question that arises here is, was the theft morally right or wrong? By asking this question to the males, Kohlberg received two different sets of answers.

One is based on the conventional level that is Heinz did a wrong thing. Another one is based on the post conventional level that is Heinz was correct as the life of his wife is more important than the property right of the pharmacist.

But when the same question was asked to the women, they gave same answer. They replied that Heinz was wrong. They further added that instead of robbing the medicine, Heinz could have tried some other alternative solution. They also told that Heinz must have convinced the pharmacist to give the medicine.

From the above, Kohlberg concluded that women‘s decisions are always based on conventional rule and also they always have various opinions in applying the general principles and moral rules about the right to live.

Based on the Kohlberg‘s comment on the women, Gilligan came to a different conclusion. She tells that it shows greater sensitivity to people and personal relationships. She concluded that the decisions taken by women is based on the context and not on the basis of general rules ranked in order of priority.

Now, the question here is, how Gilligan‘s theory of moral development relates to the theory of moral autonomy as a goal of studying ethics at the college level?

Autonomy needs independent reasoning on the basis of moral concern and not separated from other people. As per Kohlberg‘s theory and Gilligan‘s theory, moral autonomy must be consistent with ‘context -oriented‘ and also with an awareness on general moral principles and rights.

Engineering as Social Experimentation

Comparison with Standard Experiments – Knowledge gained – Conscientiousness – Relevant Information – Learning from the Past – Engineers as Managers, Consultants and Leaders – Accountability – Role of Codes – Codes and Experimental Nature of Engineering.

3.1 Comparison with Standard Experiments – Knowledge gained

Here let us see the reason for engineering projects viewed as experiments

There are many aspects of engineering that makes it appropriate to view engineering projects as experiments. The three important aspects are as follows,

Engineering projects, like the standard experiments are carried out in partial uncertainties.

The uncertainties may include in the,

(i) Design calculation

(ii) Exact properties of raw materials used

(iii) Constancy of material processing and fabrication and

(iv) Nature of working of final product.

The final outcomes of engineering projects are also generally uncertain like those of other experiments.

For example, a nuclear reactor may reveal unexpected problems that endanger the surrounding people, some products such as high heels shoes, slippers, cosmetic items may cause some side effects to the users and who knows, the users of cell phone may be exposed to some unidentified harms in the future.

Similar to standard experiments, engineering experiments also require thorough knowledge about the products at the pre-production and post-production stages.

Thus engineering, like any other experimentation, requires constant monitoring, alertness and vigil on the part of the engineers at every stage of the project.

Engineering experiments differ from standard experiments.

1. Experimental control

•Experimental control is the most important difference between engineering and other standard experiments.

•In standard experiments, experimental control involves selecting members for two different groups randomly. The first group members are given the special, experimental treatment, whereas the members of other groups are not given that special treatment. Even both the groups are subjected to same environment ; the group that was not given the special treatment is called "control group".

•In engineering experiments, usually there is no control groups. Sometimes the control group is used only when the project is limited to laboratory experimentation.

Because the engineering experiments involve human beings as they are considered as the experimental subjects. In fact, clients and customers have more control, as they own the authority of that project. So here the experimental subjects say clients or end user's are out of the experimenter's control. In this type, it is not possible to select the member from various groups randomly. Instead the engineers should work with the available historical and fair data about various groups randomly. Instead, the engineering concept should work the available historical and fair data about various groups that uses the end product.

The above discussion also justifies the view of engineering as a social experimentation.

2. Informed consent

It is known that, there is always a strong human interface in the use of the engineering experiments, results and also the beneficiaries are invariably humans. Therefore, engineering experiments are also viewed as a part with medical experiments as both experiments are performed by humans. When a medicine or an engineering product is to be tested on a person, then the moral and legal rights is to get, "information consent" for him.

Informed consent consists of two main elements.

(1) Knowledge: The human subject should be given all the information to make a reasonable decision.

(2) Voluntarism: The human subjects should show their willingness to be a human model voluntarily. The person should not be forced, deceived, fraud, etc.

The manufacturer of the product should give all the information about the potential risks and benefits of their products to their customers and users.

The characteristics of a valid consent:

The informed consent is called as “valid consent” when the following three conditions are met.

1. The consent should be given voluntarily and not forcibly.

2. The consent should be based on all the information needed for the rational person to make a reasonable decision.

3. The consentient should be physically and mentally fit; then he should be a major i.e., above 18 years.

3.2 Conscientiousness – Relevant Information

General responsibilities of engineering as society:

• Engineers are primarily considered as technical enablers or facilitators, rather than being the sole experimenters.

• Engineers responsibility is shared with management, the public and others.

• The other unique responsibility of engineers include monitoring projects, identifying risks, providing customers and clients the required information to make reasonable decisions.

• While exercising engineering duties, the engineers should display the virtue of being morally responsible person.

General features of moral responsible engineers:

1. Conscientiousness

2. Relevant information

3. Moral autonomy

4. Accountability

Conscientiousness:

• Conscientiousness means commitment to live according to certain values. It implies conscientiousness.

• Engineers have to be sensitive to a range of moral values and responsibilities, which are relevant in a given situation.

• Also engineers should have the willing to develop his/her skills and has to apply the effort needed to reach the best balance possible among various considerations.

• 'Open eyes and an open mind' are required to evaluate a given situation, its implication and to determine who are involved or affected.

• The primary duty of morally responsible engineers is to protect the safety of human beings and respect their rights of consent.

Relevant information:

• Conscientiousness is impossible without the relevant factual information.

• Engineers have to show the commitment to obtain and properly gauge all the information related to meeting one's moral obligations.

The two general ways of losing perspective on the context of one's work are given below.

1. To grasp the context of one's work, one should be aware of implication of that work.

2. Shifts the responsibility and blame the others in the organization.

Thus, conceiving engineering as social experimentation, it is important that engineers act as responsible agents. The responsible agents require,

• Imaginative forecasting of possible bad side effects.

• The development of an attitude of 'defensive engineering' and 'preventive technology'.

• Careful monitoring of projects.

• Respect for people's rights to give informed consent.

Moral autonomy:

• The moral autonomy is the ability to think critically and independently about moral

• issues and apply this moral thinking to situations that arise during the professional engineering practice.

• It is understood that an individual's personality depends on the integration of his moral benefits and attitude.

• When one's labour and skills are sold, then it is an illusion to think that the person is not morally autonomous.

• As an experimenter, an engineer has to undergo an extensive and updated training to form his identity as a professional.

• There will be a personal involvement in one's work.

• The magnitude of moral autonomy to be experienced by engineering is highly influenced by the attitude of company‘s managements.

• Where there is a treat for engineers moral autonomy, then engineers can look for moral support from their professional societies and outside the organization.

Accountability:

• The term “accountability” means being responsible, liable, answerable or obligated.

• In proper terms, the accountability refers to the general tendency of being willing to submit ones action to any type of moral scrutiny and be responsive to others assessment.

• It involves a willingness to present morally convincing reason for ones actions and conduct.

• Morally responsible people are expected to accept moral responsibility for their action.

• According to Stanely Milgram, people are not willing to accept personal accountability when placed under authority.

• There exist a lot of difference and separation between casual influence and moral accountability in all professions including engineering.

• Because of modern engineering practices, the complication in accepting one‘s moral accountability is further worsened. Some of these situations are explained below.

1. Modern engineering projects involve teamwork, in which each member contributes a small amount of personal accountability.

2. The modern organization are based on the principle of “division of work”. Due to this division of work, the personal accountability are also stretched within the hierarchies of authority.

3. A pre-occupation with legalities in a time of proliferating malpractice lawsuits.

3.3 Learning from the Past

It deserves a special mentioning that engineers must have the positive attitude to learn and gain important innovative information not only from their designs but also from other sources of various engineers. This healthy practice would pave a definite way for boosting up the morality and integrity of engineering profession on the whole. Moreover, mutual exchange of technical knowledge and information without any prejudiced feelings and egoism would enable engineers to improvise the designs without the past errors and defects.

These statements are documented by the following illustrations,

1. Adequate provisions were not made for more number of life boats even after the complete destruction of steam ship Arctic due to the same problem.

2. Repeated cases of collisions of ships with bridges such as Maracaibo bridge at Venezuela in 1964, Tasman bridge at Australia in 1975 and Tampa Bay at Florida In 1980 have been reported. The recurrent accidents indicate the utter negligence and poor monitoring on the part of engineers to have an inter-communication between them and also their inconsistent attitude for mutual reciprocation of technical informations.

3. A nuclear reactor accident due to malfunctioning of valves, occurred tragically at Three Mile Island in 1979. Similar cases were later reported at some other places. Despite the proper filing of required data by the manufacturer, sheer negligence and improper attention on the part of engineering are held responsible for the recurrences of these reactor accidents. The inconsistent attitudes and lack of attention of engineers have to be blamed.

All these examples clearly point to the fact that engineering profession would incorporate technical practitioners, apart from project engineers for an effective vigilance and moral responsibilities over the complete aspects of the concerned projects.

3.4 Engineers as Managers, Consultants and Leaders

Engineers as managers

Engineers move into management roles, because of two reasons.

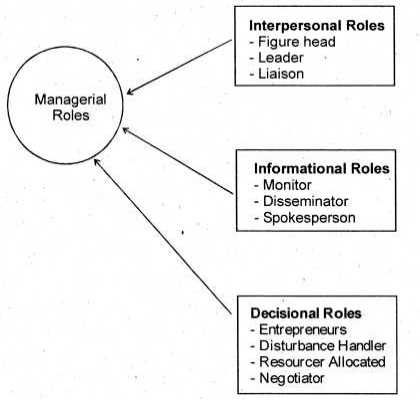
1) Many corporate management prefer engineers as their managers, because they believe that they are capable to do the following,

• To manage technological corporation.

• To manage and teach non-engineers about engineering techniques.

2) Engineers are attracted by various corporate incentives such as higher pay, greater authority, etc.

Mintzberg's role approach provides different views on management than the four management functions. At first glance it might seem that the Mintzberg's findings are incompatible with the views, that the planning, organizing, leading and controlling are important parts of management process.



Managerial roles

Managerial roles of an engineer

1. Interpersonal role

The interpersonal roles grows directly out of the authority of a manager's position and involves developing and maintaining positive relationship with others.

The interpersonal roles of managers include,

- Figurehead
- Header
- Liaison

Figurehead role:

Being managers, as the head of organization in figurehead role, manager performs symbolic or ceremonial duties of either social or legal nature. This includes presenting awards and entertaining dignitaries. Presiding at a farewell reception for a departing employee. Managers spend 10-12% of their time in this role.

Leader role:

In leader role, manager builds up relationship with sub-ordinates also communicates, motivates and train the employees.

Liaison role:

Here the manager maintains a networks of contacts, outside work unit who provides help and information.

This includes not only managers. They also include customers, suppliers, government, official managers etc. **Informational role**

Informational role pertains to receiving and transmitting information from staff members. The managers play a great role in this.

The roles involved here includes,

- Monitor role
- Disseminator role
- Spokesperson role

Monitor role:

Managers monitors or scans the source of information. Management collects the internal and external information.

Disseminator role:

The managers pass the information to the press or sub-ordinates from either internal or external sources.

Spokesperson role:

Managers provides information about the organization to the external community such as press, TV, suppliers and to government officers.

Decisions role

Here the managers examine alternatives and then make choices and commitments. It includes entrepreneurs, handle resource allocator and negotiator.

Entrepreneur

Managers acts as initiator, designer and encourages change and innovation to improve.

Managers not only make routine decision in their jobs but also frequently make decisions that explore new opportunities or start new projects.

- Disturbance handler
- Resource locator

- Negotiator

Disturbance handler role:

Managers takes collective action when organization faces important, unexpected difficulties.

Managers has to settle the disputes which affects the company's functioning like, strikes, notations.

Resource allocator role:

In resource allocator role, manager distributes resources of all types including time, finding, equipment and human resources.

Negotiator role:

Manages negotiation on behalf of company with trade union, contract or joint venture.

Impact of transition on ethical issues:

Generally managers are charged for,

(i) Merely serving for narrow interests of the corporation.

(ii) Their objective of increasing the firm's profit only.

(iii) Not bothering about other responsibilities to promote the public good.**Responsibilities of engineers - managers:**

- Promoting an ethical climate.

- Resolving conflicts - conflicts such as schedules, human resource availability, technical issues, administration procedures, personality, projects and departments.

Consulting engineers

Consulting engineers generally exercise their consulting activities independently. They are paid for their services by fees, not by salaries. Since they are the sole employer for their practice, they have greater freedom than most salaried engineers to make decisions about the projects. Corresponding its greater freedom, the consulting engineers should also deal with a wider variety of moral concerns than salaried engineers.

Some of the responsibility of consulting engineers are in the following areas,

- Advertising

- Competitive bidding

- Contingency fees

- Safety and clients needs

- Provisions for resolution of disputes

3.5 Accountability – Role of Codes -codes and Experimental Nature of Engineering

There are four characteristic features of morality responsible engineers, from the perspective of engineering as said experimentation.

• Conscientiousness

• Comprehensive perspective

• Autonomy

• Accountability

Accountability:

The engineers should be accountable for the results of their project. The accountability refers to the general tendency of being willing to submit one's actions to any type of moral routing and be responsive to other assessments.

Roles of code of ethics:

• The primary aspect of codes of ethics is to provide the basic frame work for ethical judgment.

• They are referred as codes of conduct agreed upon standards for professional conduct.

• The codes of ethics express the ethical principles and standards in a coherent, comprehensive and accessible manner.

• It defines the roles and responsibilities of the profession.

• It helps the professional to apply moral and ethical principles to specific situations.

These code are based on fine canons. They are,

1. Principle of ethics-integrity

2. Competence

3. Individual responsibilities

4. Professional responsibilities

5. Human concerns

Positive roles of code of ethics:

The code of ethics propagated by professional societies play a vital role. They are,

•Inspiration

•Guidance

•Support for responsible conduct

•Deterring and disciplining unethical professional conduct

•Education and promotion of mutual understanding

•Protecting the status quo suppressing dissent within the profession

•Promoting business interests through restraint of trade

1. Inspiration

Ethical codes provides a positive inspiration for the professionals to exercise their obligations effectively. These codes inspires the engineers to apply moral principles under the various conflicting situations.

2. Guidance

The ethical codes provide guidelines for achieving the obligations of the professionals. These codes also provide specific guidelines, which tell how to apply the code to the unique situations.

3. Support

The ethical codes offer positive and potential support to engineers to perform their duties in ethical manner.

At times, the codes can serve as legal support for those engineers who are tangled in professional obligations and conflicts.

4. Deterrence and discipline

The ethical codes can be used for deterring and disciplining unethical professional conduct. These codes are also considered as the formal basis for investigating unethical conduct.

5. Education and mutual understanding

The ethical codes can be used in educational institutions and other places for emphasizing the importance of moral issues and values. They are also useful to encourage a shared understanding

among the public, an governmental organizations and professionals, concerning the moral responsibilities of engineers.

6. Contributing to the profession's public image

The ethical codes can confer a positive image to the public of an ethically committed profession. The codes enables the engineers to serve the public more effectively.

7. Protecting the status quo

The codes constitute of ethical conventions. These ethical conventions can promote a minimum acceptable level of ethical conduct. The codes can also suppress the dispute within the profession.

8. Promoting business interests

The codes of ethics promotes business interests through restraint of trade. They help in facilitating morally feasible business dealings to the professionals. The codes should be applied with caution, keeping in view their limitations.

Here we shall discuss about the codes of ethics with the advantages and disadvantages

Advantages:

• It provides inspiration and guidance.

• It supports for responsible conduct.

• It educates and promotes the mutual understanding.

• It contributes a positive public image of the profession.

• It protects the status quo and promotes the business interest.

Disadvantages:

• It has basic guidelines which is restricted to general and vague wordings/phases.

• It often has internal conflicts which may result in moral dilemmas.

• It cannot serve as final moral authority for professional conduct.

Proposals for promoting ethics:

• Engineering societies should act as the form for debating what should be in a professional code of ethics.

• By establishing awards for engineers who exhibit commendable ethical conduct.

• By assisting and protecting engineers who have been discharged.

• Engineering societies can establish 'ethics helplines'.

• By helping to educate the public about new technologies.

• Engineering societies can also promote the discussion and understanding of engineering ethics by depicting in the application of their codes.

Let us discuss about the codes of ethics of engineers:

• The perspective of engineering as social experimentation provides some useful clues in prioritizing and ranking the various functions of the ethical codes.

• The supportive function of engineering codes is viewed as the primary important function. Because the supportive function of engineering codes enables the engineers to express their views freely, especially about safety to those affected by engineering projects.

• The disciplinary function of engineering codes is recognized as the secondary important function. Because, this function is essential in engineering as it ensures all clear and enforceable laws and rules.

• The guidance, inspirational and educational functions of engineering codes are also important. Because they promote mutual understanding among those affected by them.

• The functions of protecting the status quo and promoting only business interests in violation of free competitions should be avoided altogether.

Thus it should be kept in mind that codes are only a small part of engineering ethics. Also codes are not sacred writ and should always be open to critical examination.

4

Engineers' Responsibility for Safety and Risk

Safety and Risk, Concept of Safety – Types of Risks – Voluntary v/s Involuntary Risk- Short term v/s Long term Consequences- Expected Probability- Reversible Effects- Threshold Levels for Risk- Delayed v/s Immediate Risk- Safety and the Engineer – Designing for Safety – Risk-Benefit Analysis- Accidents.

4.1 Safety and Risk

Safety

The initial version of William W. Lawrence's definition for safety is as follows.

"A thing is safe if its risks are judged to be acceptable". It means, a thing is safe for a person if the perceived risk is less. Similarly, a thing is unsafe if the perceived risk is high.

The safety concept

1. "A ship in harbour is safe, but that is not what ships are designed for" – John A. Shed

• We purchase an ill-designed iron box in a sale-> Underestimating risk

• We judge fluoride in water can kill many number of people -> Overestimating risk

• We hire a taxi, without thinking about its safety -> Not estimating risk

How does a judge pass the judgement on safety in these 3 cases?

So, this definition won't do in real life.

Then, what can be acceptable also depends on the individual or group's value judgement. Hence a better, working definition of concept of safety can be stated as, "A thing is safe with respect to a given person or group at a given time if, were they totally aware of its risks and expressing their most settled values, they would judge those risks to be acceptable" -Mike Martin and Roland Schinzinger

A thing is not safe if it exposes us to unacceptable danger or hazard. RISK is the potential that something harmful and unwanted may occur. We take a risk when we undertake something or use a product that is not safe. In technology, risk could include dangers of bodily harm, economic loss or

environmental degradation. Some may consider that “safety” is a concrete term, while “risk” is a vague, hypothetical concept.

• In fact, its the other way around.

• Risks exist always. But true safety does not exists, except in hypothetical situations.

• So, risk is reality, safety is fantasy.

What degree of risk is acceptable?

Safety is a matter of how people would find risks as acceptable or unacceptable, they knew the risks and are basing their judgments on their most settled value perspective. So, to this extent, it is objective.

So, Safety is 'acceptable risk'.

Risk

William W. Lawrence has defined risk as, “a compound measure of the probability and magnitude of adverse effect”.

Acceptable risk

A risk is acceptable when those who are affected are generally no longer apprehensive about it."

Apprehension depends largely on factors such as,

• Whether the risk is voluntarily assumed.

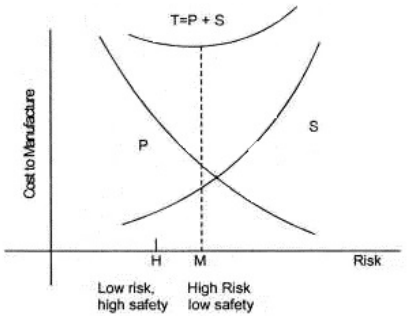
• How the probabilities of harm is perceived.

• Job-related or other pressures that causes people to overlook or to be aware of risks.

• Whether the defects of a risky activity or situation are close at hand or immediately noticeable.

• Whether the potential victims are identifiable beforehand.

Safety-risk analysis



Safety risk analysis

Where,

P - Primary cost of product

S - Secondary cost

T - Total cost

It is necessary to understand the relationship between safety, risk and costs. Analysis based on the above things is called as safety-risk analysis.

Disaster

It is a serious disruptive event coincides with a state of insufficient preparation. Engineering design may results in disaster due to errors. These minor design error, the device may not perform as expected or may perform illegal operation.

Example:

Minor casting defects in aircraft turbine blades may cause failure of the system. Systematic accidents will also results in disaster.

Failure of US space shuttle.

4.1.1 Concept of Safety

Safety is a state in which the hazards and its conditions leading to physical, psychological or material harm are controlled in order to preserve the health and well-being of individuals and the community. It is the essential resource for everyday life needed by individuals and communities to realize their aspirations.

Attaining the optimum level of safety requires governments, communities, individuals and others to create and maintain the following conditions, whichever setting is considered.

• The prevention and control of injuries and other consequences or harm caused by the accidents.

• A climate of social cohesion and peace as well as of equity protecting the human rights and freedoms at the family, local, national or international level.

• The respect of the values and the physical, material and psychological integrity of the individuals.

• The provision of effective, preventive control and rehabilitation measures to ensure the presence of the previous three conditions.

These conditions can be assured by the initiatives which focuses on the environment and on behaviour.

4.2 Types of Risks

Effects of risk:

It includes dangers of bodily harm, economic loss and environmental degradation.

Causes of risk:

Risks or harms caused by delayed job completion, faulty products or systems and economically or environmentally injurious solution to technological problems.

Determination of risk:

1. Knowledge of risk.

2. Uncertainties in design.

3. Testing for safety.

Factors influencing risk:

1) Voluntary (Vs) Involuntary risk.

2) Short term (Vs) Long-term consequences.

3) Delayed (Vs) Immediate risk.

4) Expected probability.

5) Reversible effects.

6) Threshold levels for risk.

Types of risk:

1) Voluntarism and control

Voluntary risk:

If people take risk knowingly, then their involvement of risk is known as voluntary risk. Many people consider it safer if they knowingly take on the risks. Also people believe that they have 'full control' over their actions.

Examples for voluntary risks are,

1) Buying a flat/house near a chemical plant that emits low levels of a toxic waste into the air because the property values are very low.

2) Participating in a potentially adventurous sports such as motorcycle racing, skiing, boxing, hang-gliding, bungee jumping, etc, without much safety guards.

Controlled risk:

If the risk-taken is within the control limit, which can be controlled by any means, then the risk is known as controlled risk.**Examples for controlled risk:**

In practice, all the dangerous sports such as motorcycle racing, skiing, hang-gliding, bungee jumping, horseback riding, boxing etc, are carried out under the assumed control of the participants. They use all safety guards to keep the risk under control.

2) Effect of information on risk assessments

The information about a harm/danger should be presented in a systematic and appropriate manner. Because, the manner in which the required information for decision making is presented has a great influence on how risks are perceived. Many case studies and experiments have proved that the manner in which information about a danger is presented can lead to undesirable and wrong perceptions about danger.

The threshold limit of individuals for information varies from person to person. Some would be comfortable only when they have information of deeper depth and quality, while others may be comfortable with minimal information.

Many experiments have drawn the following two conclusions.

1) Options perceived, as yielding company gains will tend to be preferred over those from which gains are perceived as risky or only probable.

2) People tend to be more willing to take risks in order to avoid perceived company losses than they are to win only possible gains.

3) Job-related risks

The exposure of risk depends on the person's job and his work place. The nature of the job and the working environment will determine the risk level of a person.

For example, people working in the coal mines, oil mines, shipyards, chemical plants, nuclear power plants, etc., have more probability of being exposed to the high risks. Because of high competition for survival, the employees don't have any options other than undertaking high-risk jobs.

Unions and occupational and safety regulations should regulate and enforce the employers to facilitate the standard working environment. Most importantly, engineer who design and equip workstations must take into account the various safety issues and the worker's suggestions/complaints regarding their workplace.

4) Magnitude and proximity

Our reaction to risk is affected by the magnification and the personal identification or relationship we have with the victims. For instance, we feel very bad if one of our close relatives or friends are subjected to some problems. Thus, the magnitude of risk and the proximity with the victims greatly influences the degree of reaction to the risk.

4.2.1 Voluntary v/ s Involuntary Risk

Voluntary risks are the risks that people take knowing that they may face consequences. These risks includes driving a car, skydiving, climbing a ladder and smoking tobacco.

Involuntary risks are risks that people take either they are unable to control the fact that they are at risk or not knowing that they are at risk, such as secondhand smoke. These risks includes environmental hazards such as a toxic waste dumped at next door, lightning, tsunamis and tornadoes.

4.2.2 Short term v/ s Long term Consequences

Something that might cause a short-lived illness or disability seems safer than something which results in the permanent disability. The activity for which there is a risk of getting a fractured leg will appear much less risky than an activity with a risk of a spinal fracture, because a broken leg will be painful for months, but generally the full recovery is the norm. Spinal fractures can lead to permanent disability.

4.2.3 Expected Probability

Many might find a 1 in 1,000,000 chances of several injury to be the acceptable risk, whereas a 50:50 chance of a fairly minor injury to be unacceptable. Swimming at a beach where there is known to be a large concentration of jellyfish would be unacceptable to many, there would be a high probability of a painful, though rarely fatal, sting. Yet, at the same beach, the risk of a shark

attack is low enough, even though such an attack would very likely lead to dismemberment or death. It is important to remember here that the expected probability is only an educated guess.

Likelihood or probability assignment can be classified as,

• Qualitative

• Quantitative

This estimates the probability of each possible accident based on,

– Past history of accidents/incidents.

– Industry benchmarks.

Likelihood/probability can be defined in terms of occurrences per,

• Events

• Units of time

• Items

• Activity

• Population

4.2.4 Reversible Effects

Something will seem less risky if the bad effects are ultimately reversible. This concept is similar to the short-term vs long-term risk.

4.2.5 Threshold Levels for Risk

Something that is risky only at the fairly high exposures will seem safer than something with a uniform exposure to risk. For example, the probability of being in an automobile accident is the same regardless of how often we drive. In contrast, studies have shown that low levels of nuclear radiation actually have the beneficial effects on the human health, while only when the higher levels of exposure are there, which cause severe health problems or death. If there is a threshold for all the effects, generally there will be a greater tolerance for risk.

4.2.6 Delayed v/ s Immediate Risk

An activity whose harm is delayed for many years will seem much less risky than something with the immediate effect. For example, for several years now, Americans have been warned about the adverse long-term health effects of the high-fat diet. This type of diet can lead to chronic heart problems or stroke later in life. Yet, many ignored these warnings and are unconcerned about the

risk that is so far in the future. These same people might find the activity such as skydiving which is unacceptably risky, since an accident will cause immediate injury or death.

4.3 Safety and the Engineer

Acceptability of risk:

According to D. Rouse, "A risk is acceptable when those affected are generally no longer apprehensive about it". Apprehensiveness mainly depends on how the risk is perceived by the people.

Lessons for the engineers:

Engineers have the challenge to face/overcome the following two different public conceptions of safety.

(1) Positive or optimistic attitudes:

Some people assume that things that are familiar, that have not hurt them before and over which they have same control, present no real risks.

(2) Negative or pessimistic Attitudes:

Some people feel feared, when an accident kills or harms in large numbers or affects their relations, they consider those risks as high risks.

Therefore, while designing a thing, engineers should recognize and consider such widely held perceptions of risks along with their routine technical design issues. So, engineers should recognize this as part of their work.

Engineers should also understand that it is not wise to proceed under an assumption that education will quickly change the people's under-estimation or over-estimation of the risk.

The continuous, proper information about dangers and other issues of risk are necessary to educate the people to have right attitude and perception about the risk. The risk communication and risk management efforts should be structured as a two way process.

Safety measures to be taken in establishing an engineering unit:

- A design should comply with the legal standards for product safety and other applicable laws.
- An acceptable design should meet the standard of accepted engineering practice.
- Alternative designs that are potentially safer should be explored.

• While designing any product, all possible misuses of the product by the consumer should be identified.

• Finally, the designed product should be tested using prototypes to determine,

(i) Whether the product meets the specifications.

(ii) Whether the product is safe to use.

Responsibility of engineers in the design of product:

- Eliminate
- Reduce
- Inform
- Control

Eliminate:

The identified hazard in the product can be eliminated. Need to go through mandatory requirements, so far as it is reasonably practicable.

Reduce:

The designer or engineer must reduce the remaining risk associated with the hazard. There must be professional judgment but guided by relevant good practice. In reducing risk a hierarchy is to be observed.

Inform:

Provide information on the risks to the consumer so that the product can be used as informed consent. Proposed access should be discussed with the client.

Control:

It provides that the design does not change and no other influence comes to bear, then the control of the risks on site during construction or maintenance are the responsibilities of those undertaking the work. The designer is not involved.

4.3.1 Designing for Safety

Step 1: Define the problem.

Step 2: Generate multiple alternate design solutions.

Step 3: Analyze each design solution.

Step 4: Test the solutions.

Step 5: Select the best solutions.

Step 6: Implement the chosen solution.

4.4 Risk-Benefit Analysis

Risk benefit analysis is a technique, similar to cost-benefit analysis, which is used to analyze the risk in a project and to determine whether the project should be carried out or not.

Risk-benefit analysis answers the following questions,

• What are the benefits of the project/product?

• Is the project/product worth the risks connected with its use?

• Do benefits outweigh the risks?

It is understood that everyone is ready to accept certain levels of risk as long as the project/product/activity promises sufficient benefit or gain.

The risks and benefits of a project/product are assigned by money values and the most favourable ratio between risks and benefits is determined.

In risk-benefit analysis, both risk and benefits are very difficult to quantify. Because both lie in the future. That is, both risk and benefits are associated with uncertainties.

It should be noticed that who takes the risks and who enjoys the benefits? Therefore, it is important to ensure that those who have taken the risks are the beneficiaries of it.

It is mostly difficult to express both risk and benefits in a common set of units. In this case, risk-benefit analysis is used to judge the relative merits of different designs.

The ethical implications on risk-benefit analysis:

(a) Under what conditions, someone in the society is entitled to impose a risk on someone else on behalf of a supposed benefit to others?

(b) How can we consider the worst-case scenarios of the persons who are exposed to maximum risks while they are also obtaining only minimum benefits? Are they provided safer alternatives? Are their rights violated?

Accessing and reducing risk:

Risk management may be defined as the minimization or eradication of the adverse effect of the pure risks to which an organization is exposed.

Elements of a risk management are,

1. Risk identification
2. Risk evaluation
3. Risk control

Risk identification:

Risk can be identified by various techniques such as physical inspection, safety audit, job-safety analysis, management and workers discussions and historical data analysis.

Risk evaluation:

Risk can be measured on the basis of economic, social or legal considerations. Economical and social considerations include financial aspects, unmanaged cost of accidents, etc. Legal considerations include possible constraint from compliance with health and safety legislation, code of practice, etc.

Risk control:

It consists of four areas. They are,

- Risk avoidance
- Risk transfer
- Risk retention
- Risk reduction

Risk avoidance

It refers to the conscious decision by the management to avoid completely a particular risk by discontinuing the operation producing the risk.

Risk retention

It refers to retaining a particular side for which any consequent loss is financed by the organization.

Risk transfer

It refers to the legal assignment of the cost of certain potential basis from one party to another.

Risk reduction

It refers to the reduction and elimination of all aspect of accidental loss that leads to a wastage of the organization asset.

4.5 Accidents

Accidents are caused by the negligence of the worker, faulty instrument and readings.

Types

The three type of accidents are procedural, engineered and systematic accidents.

Procedural accidents are the most common accidents caused by not following the procedures such as laws and rules.

Engineered accidents are caused by the wrong design, failure of materials and devices which are not functioning, etc.

Systematic accidents are caused by many systems which work in the co-ordination. If one fails, it leads to the accumulated problems resulting in the accidents.

Case study:

Here we will see about the Bhopal disaster.

The Bhopal plant was tuned and operated by Union Carbide India, an Indian company in which Union Carbide corporation held just over half the stock. UCC technical team reports that a large volume of water was introduced into the MIC tank and triggered a reaction that ended up with the gas release.

On December 3, 1984, Union Carbide's pesticide-manufacturing plant in Bhopal, India leaked 40 tons of the deadly gas, Methyl isocyanate into the sleeping, impoverished community which was

killing 2,500 within a few days, 10,000 people were permanently disabled and it also injured 100,000 people. Ten years later, it increased to 4000 to 7000 deaths and injuries to 600,000.

Risks taken:

Storage tank of Methyl Isocyanate gas was filled to more than 75% capacity as against Union Carbide's spec, that it should never be more than that of 60% full. The company's West Virginia plant was controlling the safety systems and detected the leakages through the computers but the Bhopal plant only used manual labour to detect and control the leakage.

The Methyl Isocyanate gas which was being highly concentrated, burns parts of body when it comes into contact, even blinding eyes and destroying lungs.

Causal factors:

• Plant was understaffed due to its costs.

• Three protective systems was out of service.

• The accident occurred early in the morning.

• Most of the people killed lived in a shanty town located very close to the plant fence.

• Very high inventory of MIC, which is an extremely toxic material.

Workers made the following attempts to save the plant:

• They tried to turn on the plant refrigeration system to cool down the environment and slow the reaction.

• They tried to route the expanding gases to the neighbouring tank. The tank's pressure gauge was broken and it indicated that the tank was full when it was really empty.

• They tried to purge the gases through the scrubber. (The scrubber was designed for flow rates, temperatures and pressures that were a fraction of what was by this time escaping from the tank. The scrubber was ineffective).

• They tried to route the gases through the flare tower to burn them away. (The supply line to the flare tower was broken and it hadn't been replaced.)

• They tried to spray the water on the gases and have them settle to the ground, by this time the chemical reaction was nearly completed. (The gases were escaping at a point 120 feet above the ground. The hoses were designed to shoot the water up to 100 feet into the air).

In just 2 hours, the chemicals escaped to form the deadly cloud and killing over hundreds of thousands of people including the poor migrant labourers who stayed close to the plant.

Engineers' Responsibilities and Rights

Collegiality-Techniques for Achieving Collegiality –Two Senses of Loyalty-obligations of Loyalty-misguided Loyalty – professionalism and Loyalty- Professional Rights –Professional Responsibilities – confidential and proprietary information-Conflict of Interest-solving conflict problems – Self-interest, Customs and Religion- Ethical egoism-Collective bargaining-Confidentiality-Acceptance of Bribes/Gifts-when is a Gift and a Bribe-examples of Gifts v/s Bribes-problem solving-interests in other companies-Occupational Crimes-industrial espionage-price fixing-endangering lives- Whistle Blowing-types of whistle blowing-when should it be attempted-preventing whistle blowing.

5.1 Collegiality-Techniques for Achieving Collegiality

Loyalty and collegiality are essential aspects of team work in engineering. Collegiality is an important virtue even though it may seem to be out of place when there is competition among engineers from different companies.

Collegiality is a kind of connectedness grounded with respect to professional expertise and in a commitment to the goals and values of the profession and as such, collegiality constitute a disposition to support and co-operate with one's colleagues".- Craig Ihara. The principle elements of collegiality are respect, commitment, connectedness and co-operation.

• Collegiality is a kind of social organization based on shared and equal participation of all its members.

• Collegiality is the relationship between colleagues.

• it is the shared power and authority vested among colleagues.

Thus, collegiality is the tendency to support and co-operate with the colleagues. Colleagues are those explicitly united in a common purpose and respecting each other's capabilities to work towards that purpose. Thus, the word collegiality can connotes respect for another's commitment to the common purpose and capability to work towards it. Collegiality is an essential and excellent characteristic needed to be possessed by an engineer.

The important aspects of collegiality are respect, co-operation, commitment and connectedness and are detailed as below.

Respect:

Acknowledge the worth of other engineers engaged in producing socially useful and safe products.

An individual has to admire his colleague's expertise and their devotion for the jobs, particularly in the case of engineering, respect denotes giving respect to the work done by the other colleagues for their contributions to the development of product or production design.

Co-operation:

In any field, either at home or at work site, the co-operation, which improves co-ordination, can only get the work successfully done. According to the ethical principles, co-operation has to exist in all respects between the superiors and sub-ordinates, among the workers and between industry and the customers. Lack of co-operation leads to lack of communication, unavoidable delays and finally may lead to collapse of the design and planning. If proper co-operation is not maintained in business or industries, red-tapism may come into rule leading to lot of frustrations among the employees and finally an entire loss to the society. In such a case, it is not easy to establish Total Quality Management in the system.

Commitment:

Share a devotion to the moral ideals inherent in the practice of engineering. It can also be referred to 'sharing of loyalty' to the moral principles that are inherent in engineering practice.

Even though there is a stiff competition among the professionals and engineers, they must share their ideas with one another for the overall development of the society.

Success and completion are the two prime objectives for any work undertaken. In order to attain these objectives, either the official or the worker must have a sense of commitment. Unless and otherwise he is committed to the task assigned to him or if he is not having proper job involvement, he won't be able to proceed further.

Irrespective of the professions, this sense of commitment is very common. For instance, if a teacher is no committed to his job, the student cannot become a successful candidate. If the worker does not have any sense of commitment in the work he won't do any justice to his management or to the salary, which he is receiving.

Thus, collegiality has to be considered as a valuable character, which is to be encouraged among engineers and other professionals.

Connectedness:

Aware of being part of a co-operative undertaking created by shared commitments and expertise.

It also refers that being united with other engineers results in co-operation and keeping mutual understanding with proper support among the engineers.

Collegiality, like most virtues, can be distorted and misused. It must not be reduced to “group interest” but should be a shared devotion for public good. It is not defaming colleagues, but at the same time it does not close the eyes to unethical practices of the co-professionals, either.

Techniques for achieving collegiality are,

(i) Development recognition and articulation of shared values

In many firms, one can identify a handful of partners who are central to the collegiality of the organization. The attitudes and shared values of those partners becomes critically important in maintaining the desired environment.

Does the firm have leaders who represent as a model of performance? Does the leadership or firm talk about firm's values other than money? If the firm is really just about the business of maximizing the income for its partners, how can it expect to retain the loyalty of its partners in case if it has a bad year or if there are opportunities for its partners to make more money in the market place? If the ties that bind are only economic, the organization will be highly unstable and vulnerable. Most unstable environments sooner or later become decidedly non-collegial and partners in such organizations frequently become disrespectful of each other.

(ii) Establishing/restoring a sense of professionalism

Leadership of a firm can restore a sense of professionalism with regard to client service and the role of lawyers in the resolution of disputes, the conduct of business and the overall order of our society.

How lawyers in the firm behave towards one another, the staff of the firm, their own clients, government officials, the courts, adversary counsel and the public at large, matter greatly in establishing a culture of compatibility. Good behaviour reflecting civility, courtesy, respect, fair dealing and honesty cannot be legislated, but high standards should be established as part of what it means to be a lawyer in the firm. Simply put, lawyers who can’t behave in a professional manner destroys collegiality.

(iii) Vision

An organizational mission or vision is important to a sense of well-being and is the essence of a sense of purpose. A firm in which there is no agreed purpose or dramatically different views of the firm in constant unresolvable tension, can easily become un-collegial.

(iv) Defining expectations

Discord within a firm frequently arises because of disappointment at unfulfilled expectations. Frequently, the expectations which become disappointments are also uncommunicated in the first instance. Without undue rigidity, it is important to establish and articulate the criterion of what it means to be a partner in our firm. What general billable hour commitment is expected? What time commitment for business development is expected? What overall time commitment is expected?

Whether there is a minimum expectation for all partners or whether there are tailored expectations, which is less important than having communications about agreements over the general expectations.

A criterion is also important in regulating the selection of partners laterally or from the associate ranks. An example of a criterion would be: a partner in the law firm is expected to make a strong contribution in at least three of the four areas—business origination, management of work, production and firm administration or community service. Expectations should also be defined for associates on a firm commitment basis. Collegiality within the associate ranks is directly affected by the billable hour requirements for the associates. The firm should carefully consider the impacts of billable hour needs for associates. By setting very high billable hour requirements, the firm risks creating an environment of exploitation and may greatly limit the overall development of associates.

(v) Paying attention to structure

Managing the expectations is a key to a collegial environment. Some firms are utilizing contract arrangements to slot lawyers in arrangements where there is a base salary with a bonus tied to performance. These arrangements may permit a firm to retain a valuable lawyer who has been trained by the firm, without overexpanding or diluting the partnership. These contractual arrangements, if fairly monitored, can be used to permit greater level of flexibility in life style choices by lawyers.

(vi) Paying attention to gender and diversity issues

Collegiality can be diminished or enhanced by how and whether the leadership of the firm deals with issues of diversity and gender. Is the firm really committed to equal opportunity hiring? Are opportunities within the firm fairly open without regard to gender and race? Openness and a commitment to fairness is important in creating a collegial environment. Moreover, a firm which has women and minorities in most important positions will have significant advantages in attracting business.

(vii) Score-keeping

How the firm determines and defines the productivity can contribute to or be destructive of, a collegial environment. The lawyers tend to be remarkably attuned to score-keeping issues. If a firm gives "billable hour" credit for jogging, almost its lawyers would probably be in good shape or break down with bad knees.

It is easy to calculate some aspects of productivity, such as collections on a lawyer's time in straight billable hour cases. Other aspects of productivity, such as effectiveness in managing work, business development may be more difficult to measure. A number of questions should be taken into account. Should the firm keep in track the business development efforts and success? Should the tracking be numeric or on some other basis? How does the firm handle billing? If the firm doesn’t track business development efforts then how will it be able to reward this aspect of performance? Is the partner managing the case handling the billing functions or is the billing function retained by

the lawyer who controls the clients? How does the firm's approach in these areas affect the way work is handled? Is the environment one in which work is passed on to the lawyer, best able to handle the matter or is work being hoarded? Does the firm consist of individual lawyers who are in reality competing with each other or does it consist of lawyers acting as a team, each trying to maximize firm's profitability and trying to provide the best possible service to the client?

Firms as a general rule, should stimulate external efforts to develop the business and internal efforts to refer work within the firm to the best lawyer.

There should be accountability for good case management; in many instances the discontent between the billing attorney and the attorney managing the case restricts effective accountability. Score-keeping practices frequently evolve in response to the demands by strong partners and should be periodically examined. At the very least, the score-keeping practices should clearly be understood and articulated and should at least be open for discussion.

Compensation

There are two well defined aspects of compensation which impacts on collegiality: one is the profitability of the firm and the other is how the profits are distributed. If a firm can't achieve reasonable profitability on a per partner basis, great pressure is placed on the distribution process. Management's role is not only to encourage the steps that produce reasonable profitability, but also to manage expectations so that they would be in line with profitability.

A compensation system should,

Motivate partners to perform in ways that maximize firm's profits and to cause the firm to achieve its other objectives.

(b) Reward performance and contribution.

(c) Solidify the ties with partners who are important to the ongoing success of the institution.

Fairness, as an abstract concept, is probably less important than rewarding those partners who are vital to the preservation and success of the venture. Within certain limits, relative compensation might be of more importance than actual compensation. How a partner is compensated with regard to another contemporary or someone who is perceived to be at the same level can easily affect morale.

Differences in compensation among the partners should seem generally reasonable and explainable with reference to the firm's values. Procedural fairness might be as important as the substantive criteria used for compensation. Assuming some measures of subjectivity in the system, it is very important that partners believe there has been thoughtful consideration of their views and contribution regarding compensation.

It is extremely important that a partner be able to effect changes in his or her compensation by changes in performance and that these changes can occur over a reasonably short time span of time say, two or three years.

Among the most difficult issues in compensation are,

1. To what extent should compensation in the present year be tied to current year performance or be determined by a share of profits based on historic contribution?

2. How does the firm address the compensation demands of its superstars?

3. How quickly does the firm respond to the compensation demands of its younger partners as they become extremely productive and start to acquire substantial business?

4. How does the firm value hard work versus business generation?

Rational compensation systems significantly varies in addressing each of these issues. For the organization to be stable and collegial, those partners with the economic horsepower to threaten or destroy the firm must view the firm as insiders with a proprietary interest and not as claimants seeking to extract as much as possible from the organization. Firms confronted by a claimant mentality tend to try appeasement which is frequently unsatisfying to the claimant and others in the organization.

5.2 Two Senses of Loyalty-obligations of Loyalty-misguided Loyalty – professionalism and Loyalty

Being loyal to an employer can mean two different things. Agency-loyalty is acting to fulfill one's contractual duties to an employer. These duties are specified in terms of the particular tasks for which one is paid, as well as the more general activities of following legitimate authority within the corporation and co-operating with colleagues.

As its name implies, agency-loyalty is wholly a matter of actions, whatever its motives. Identification-loyalty, by contrast, has as much to do with emotions, attitudes and a sense of personal identity as it does with actions. It can be understood as, agency-loyalty that is motivated by identification with the group to which one is loyal. It implies seeking to meet one's moral duties to a group or organization willingly, with affirmation and personal attachment. People who detest their employers and companies, who do their work spitefully or grudgingly, are not loyal in this sense, even though they may adequately perform all their work responsibilities they manifest only agency-loyalty.

In both these senses, loyalty can be a desirable character attribute. Either sense might be meant when codes of ethics assert that engineers ought to be loyal to employers or that they should act as their employer's or client's faithful agents or trustees. Certainly, there are specific duties intended,

such as those specified by sub-headings under the injection to be a faithful agent or trustee; to avoid conflicts of interest, to inform employers of any possible conflicts of interest, to protect confidential information, to be honest in making estimates, to admit one's errors and so on.

Loyalty is another team play virtue. An employee has to be loyal to their employer. There are two types of loyalty namely,

(a) Agency loyalty

(b) Identification loyalty

(a) Agency loyalty

• When a person is employed by an organization, they usually sign a contract to the following,

• Carry-out the duties for which he is being paid for.

• Co-operate with colleagues to attain common goals of the organization and respect the line of authority in the organization.

• When a person fulfills his/her contractual duties to his/her employer, he/she said to have agency loyalty.

• Agency loyalty is purely a matter of actions irrespective of its motives.

(b) Identification loyalty

This loyalty is based on personal identification with a group. Identification loyalty means carrying-out one's moral duties willingly with a feeling of personal attachment to the group to which they are loyal.

Hence, if an employee fulfills contractual duties to their employer willingly with a sense of personal attachment, they are said to possess identification loyalty.

Both agency loyalty and identification loyalty are desirable character attributes. Absence of identification loyalty is not a defect but presence of it is desirable for which the employer also has to work for.

Thus, if an organization uses its employees only to maximize its profit, employees will possess only agency loyalty. But if the organization shows strong commitment and values its employees, respects them and takes care of them properly, employees will develop a sense of identification loyalty. Hence, identification loyalty is reciprocal. That is, in this sense, loyalty becomes a dependable virtue.

Two sense of loyalty :

Obligations of loyalty

Loyalty based on personal identification is obligatory when two conditions are met. First, employees must see some of their own important goals as met by and through a group in which they participate. Typically, these goals include the pleasures of affiliating with the group, recognition from the group that one's contributions are valuable and a sense of worth and accomplishment in pursuing the goals of the group. Second, employees must be treated fairly, each receiving his or her share of benefits and burdens once these conditions are met, employees acquire obligations to identify with groups and sometimes to support groups in particular ways.

Misguided loyalty

Both agency and identification loyalty can be shown towards corporations as a whole or towards smaller divisions within corporations. For example, engineer might identify closely with a group of committed professional while working on a particular project, but might identify less with the impersonal vast conglomerate comprising a large international firm. Conversely, an engineer might identify with the corporation but not with a particular team to which he is assigned. Sometimes, inappropriate or misguided loyalty to a project team or supervisor can harm corporations, as well as the general public.

Professionalism and loyalty

There are three points about the relationship between professional responsibility and loyalty to companies or employers. First, acting on professional commitments to the public can be a more effective way to serve a company than a mere willingness to follow company orders. Second, it is clear from the example that loyalty to their current owners or companies should not be equated with merely obeying one's immediate supervisor. Third, an engineer may have professional obligations to both the public and to employer, which reinforce rather than contradict each other. Thus, there need be no general contrast between the moral status of employees and professionals, In fact, obligations to the public and to one's employer often point in the same direction. Sometimes, an engineer seeking to protect the public is overruled by top management for financial reasons. At other times there are disagreements over technical matters and engineers are told that they must not push their own views further.

5.3 Professional Rights –Professional Responsibilities – confidential and proprietary information-Conflict of Interest-solving conflict problems

Professional rights

Professional rights are the rights processed by virtue of being professionals having special moral responsibilities.

Example:

- Right to refuse to involve in unethical activities.

• Right to worn the public about harms and dangers.

Various aspects of professional rights:

Rights of professional conscience:

It is one of the most fundamental right of engineers. The right of professional conscience refers to the moral right to exercise responsible professional judgment in discharging one's professional responsibilities.

Specific rights:

Two of the important specific rights are,

1.Right of conscientious refusal

2.Right to recognition

Right of conscientious refusal:

It is the right to refuse to engage in unethical behavior. No employee can force or pressure an employee to do something that the employee considers unethical and unacceptable.

Right to recognition:

It refers to the engineer's right to professional recognition for their work and accomplishments. The recognition/reward may be of any one of the following types.

Extrinsic rewards:

These are related to monetary remunerations like increased salaries, commissions, bonus, gain sharing, etc.

Intrinsic rewards:

These are related to non-monetary remunerations such as acknowledging achievements by issuing application letters, certificates and oral praises, etc.

Confidentiality:

Confidentiality refers to code of ethics in which certain information of the employer/client are kept secret or confidential. Conflicts of interest means an individual has two or more desires that all interest cannot be satisfied given the circumstances.

Proprietary information:

Information that a company owns or whishes to keep it confidential is known as proprietary information. It can include methods, processes and secret formulas, used in production. It can also include a company's business and marketing plans, salary structure, details of its computer systems, contracts and customer lists. In some cases, the special knowledge and skills that an employee has learned on the job are considered to be a company's proprietary information.

This is primarily used in legal sense.

It is also called called trade secret. A trade secret can be virtually any type of information that has not become public and which an employer has taken steps to keep it secret.

Conflicts of interest

Conflicts of interest means an individual has two or more desires, that all interests cannot be satisfied with the given circumstances.

Examples:

• An employee working in a company depositing a substantial investment in competitor’s company.

• An employee working in a company sourcing as a consultant for a competitor’s company.

5.4 Self-interest, Customs and Religion-Ethical egoism

The next step is to contrast ethical values with three other types of values.

(a) Self-interest values

(b) Values generated by customs

(c) Religious values

Value of self-interest (ethical egoism):

Right ethics theory states that it is our right to take care of our interests whereas utilitarian theory states that we have to take care of our interests as well as other’s interests. Two great authors Thomas Hobbes and Ayru Rand came to the conclusion that morality must involve pursuit of self-interest only. This theory is called "Ethical Egoism”.

This theory also supported by classical economists like Adam Smith and Milton Friedman who believe that if a co-operation, pursue the goal of maximization of profits, that itself is a great service to the society. Ayru Rand has also expressed that in order to achieve self-happiness, over a long period, it should also involve taking care of other’s interests.

Limitations:

In short, this simply means we live for ourselves only, to the exclusion of all others; even if we serve others, it is for our satisfaction only!! Such a theory, is therefore very defective.

Self interest and ethical egoism

• Self interest, simply means looking after one's own needs.

• The concept of ethical egoism means that everyone of us should look into only those consequence's that affect us. That is, each person should do things that are most beneficial to themselves .

• The concept of ethical egoism also tells us that each person is the best judge of their own self-interest. Hence, each person is responsible for maximizing their own self-interest.

• Hence ethical egoism concentrates only on an individual in satisfying his/her own self-interest. Thus, it is clear that the ethical egoism preaches one to be selfish. But morality concentrates on throwing away one's own self-interest for the benefit of others and preaches public interest in terms of safety, health and welfare.

• In the profession of engineering, it is very important to note that engineers and corporations should put limitations to their own self-interest and have moral concern when they act on a situation. Hence morality that we value are concerned for the good of other people.

Everyone benefits if all pursue their own self-interest.

Society mostly gets benefited when,

Individuals pursue their own self-interest and

Corporations pursue maximum profits in a free market environment. —Adam Smith

Ethical egoism does provide guidance for behaviour, but it denies the more global notion of moral behaviour.

Religion-ethics

To say an action is right means it is commanded by God; a wrong action is forbidden by God; there is no morality without God. But, Socrates asked, in effect, Are the commands of God based on whim? Why does God make certain commands? Surely not. God is good.

Divine Command Ethics seems to have things backwards, instead of commands of God creating morality, moral reasons provides the foundation for the commands of God. This discussion does not rely on questions of supremacy or the existence of God. Nor does it deny the purpose or importance of the religion, which is, in part, to motivate right action.

Customs and ethics

This is based on the concept of ethical pluralism which means that there are many views of looking at ethical problems and it is difficult to peg down to one solution which is acceptable to all.

Therefore the concept of "ethical relativism" introduced; According to this concept, what is morally correct is determined by the law or custom of the place. In other words any action is moral if it is within the frame work of law or custom. While ethical egoism reduces moral issues to the level of self-interest. Ethical relativism reduces moral issues to the level of laws and customs.

The merit of the relativism concept is that it is clear-cut and not ambiguous. But the demerit is that it is just not enough to measure ethical values with only legal standards.

There are others who argue that ethical values change based on culture of the country and society. This is also a limited argument. For example, who can justify the crimes of the Nazi regime, based on the culture and Germany's requirement at that time?

Customs and ethical relativism:

We have to agree that we live in a society that has different customs followed by different category of people. For each group of people their customs are right even though it may not be agreed upon by other groups.

Ethical relativism states that an action will be considered morally to be right if they are approved by customs or laws and they are considered morally to be wrong if they are violating customs or laws. Hence ethical relativism attempts to reduce moral values, laws and customs of particular societies.

Ethical relativism appears to be attractive due to the following reasons.

• Customs and laws appear to be tangible and clear-cut.

• It treats the values as subjective at the cultural level encouraging the virtue to tolerate differences among societies.

• Because there are people who believe that moral judgement are to be made in relation to factors that may vary from situation to situation, thus making it impossible to have commonly acceptable rules that are absolute.

It should be noted that in engineering profession, ethical relativism cannot be accepted. Beliefs/customs cannot be taken for granted as they are usually self certified ones. Even if they are used widely and has become customary, they cannot be accepted unless it is universally morally correct to be followed.

Religion and divine

It is true that religious beliefs have shaped moral values, for example, Christianity has shaped western societies, Islam has influenced the middle East and Buddhism, the Chino-Japanese societies. It is also very important that ethical values are infused through religion—in that way, the

values remain unshakable. Many times religion sets very high standards—like "love your neighbour as you love yourself or treat animals as equivalent to men, because all souls are equal.

In these situations, the standards set by religion are higher than the normal moral standards.

Religion and divine command ethics :

There are many religions in this world and each one of them preach moral values. Hence, people belonging to various religions develop religions beliefs.

Moral commitments and religions beliefs are related in many positive ways.

- They are related historically.
- They are related psychologically.
- They are higher than that of conventional moral standards.
- Below what, most of us view it as acceptable moral standards.

But divine command ethics states that,

An act is right when it is commanded by God and an act is wrong when it is forbidden by God.

5.5 Collective bargaining-Confidentiality

Collective bargaining:

Collective bargaining is defined as the negotiation about working conditions and terms of employment between an employer and one or more representative employee's with a view to reach agreement.

Advantages:

• It improves the standard of living of employees.

• It resists to perform unethical acts.

• It maintains stability by providing an effective grievance procedure for complaints.

• It can act as a counterforce to any radical political movements that exploit the employees.

Limitations:

• It encourages unrest and strained relations between employees and employee.

• Individuals are not given importance in the process.

• It shatters the economy of a country by placing distorting influences on efficient uses of labour.

Here let us see the concept of confidentiality in professional ethics

It is widely accepted that the engineers have an obligation to keep certain information of the employer/client secret or confidential. It is highly emphasized in most engineering codes of ethics.

Confidential information:

It is any information that the employer would like to keep it as a secret in order to compete effectively against business rivals.

• Privileged information.

• Proprietary information.

• Trade secret.

• Patents.

Confidentiality in engineering information:

Many information such as privileged information, proprietary information and trade secrets are very important for a company to compete in the market. The following things are to be kept confidential.

• Information about unreleased products

• Test results and data about products

• Design or formula for products

• Data about technical process

• Quality control procedures.

Limits of confidential ability:

First level:

It focuses on three moral considerations such as,

• Respect for autonomy

• Respect for promises

• Respect for public well-being.

Second level:

It focuses on three ethical theories.

• Justification by right ethicists

• Justification by duty ethicists

• Justification by utilitarians.

5.6 Acceptance of Bribes/ Gifts-when is a Gift and a Bribe-examples of Gifts v/ s Bribes-problem solving-interests in other companies

Acceptance of bribes/gifts:

Is there a conflict of interest or the appearance of a conflict, that arises because of the gift?

What's the gift's value?

Is the gift provided out of generosity or for a purpose?

What's the gift's purpose?

Is it a gift or entertainment?

What are the circumstances?

What power do I have to bestow favours in return for gifts?

What's the industry accepted practice?

What's the organization's policy?

What's the law?

The definition of 'bribe' and 'gift' are as follows,

Gift:

Something of value given without the expectation of return.

Bribe:

Something of value given with the hope of a future benefit or influence.

Gifts and bribes can be money or actual items such as rounds of golf or meals, tickets to a sporting event etc.

When a 'gift' is given or accepted – regardless of the intention of the gift-giver, it can give an wrong impression and the appearance that whatever has transpired is not on the 'up and up'. In other words, whatever may have been an innocent gesture, could be interpreted as just the opposite and can blur the lines of integrity, fairness and trust.

Depending on whether we do business solely in the private sector, with state, local or federal governments or internationally, the importance of how our company chooses to manage this subject will prove important.

When is a gift and a bribe:

Exactly where the line is drawn between corruption and acceptable practice is always difficult to decide. Given that difficulty, all companies should adopt a gift policy setting out what is acceptable and what is not acceptable, within the limits of the law.

Most corporate gift policies require that gifts or hospitality received or given should be entered into a gifts register, which is usually monitored by an responsible person or ethics officer.

Where the responsible person or the ethics officer believes that the hospitality and giving or receiving of a gift may amount to bribery or will lead to an expectation of preferential treatment, the employee should decline, regardless of the value.

Gifts which are clearly of an advertising or promotional nature, such as calendars, pencils, business diaries, branded T-shirts and mugs would be acceptable, as they are other promotional or advertising products of insignificant value.

Unacceptable gifts include those that,

• Are given for purposes of influencing the recipient.

• Violate the company's ethics policy and code of conduct.

• Amount to loans from any company supplier, customer, etc or any preferential arrangement not readily available to the public.

• Are illegal or involve an improper, biased or dishonest act.

• Involve conduct of sexual nature and/or violation of mutual respect.

• Constitute reciprocal agreements.

• Result in breach of mutual respect.

• Result in the abuse of a position of authority

• Would result in the violation of any law.

• May be construed as being given or received for an improper purpose.

The general rule is that where the giving or receiving of courtesies or gifts, other hospitalities or payments may constitute an inducement to obtain an improper advantage over another, the giving or acceptance of the gift or hospitality is not advisable.

As far as public officials are concerned, one needs to keep in mind that the code of conduct under the Public Service Act, with which employees of the public service are required to comply with it, prescribes that such employees must not use their official positions to obtain benefits or private gifts for themselves when they performance their official duties, nor should they accept any gifts or benefits when offered, as these may be considered as bribes.

In terms of the Senior Management Services Handbook, which is applicable to all the members of the senior management services across all sectors, senior managers must not accept or solicit any bribe or other improper inducement.

Only in exceptional circumstances gifts should be accepted. Senior managers may accept moderate acts of hospitality or unsolicited gifts. Accepting such benefits or gifts is essentially a matter of

judgment for the individual concerned. In such cases, they must be satisfied that their position will not in any way be compromised by acceptance.

Senior management employees in the public service are also required to report each year to the Provincial Premier or relevant Minister in whose department they are employed, any gifts with a value of more than Rupees 350 or gifts from an individual source which cumulatively exceeds Rupees 350 in value during any 12 month reporting period.

The Executive Ethics Code published under the Executive Members Ethics Act prohibits Members of Provincial Executive Committees, Deputy Ministers and Cabinet Ministers, who are Ministers in the provincial cabinets, from accepting or soliciting any benefit or gift that is given in return for a benefit that constitutes an improper influence; or is an attempt to improperly influence the member of the committee.

As per the EE code, Ministers or Members are also generally required to disclose any gifts with a value exceeding Rupees 350 or gifts from a single source which cumulatively exceed Rupees 350 in value during any calendar year.

Example of gifts v/s bribes:

While on a field trip to country XYZ with students, the member or the staff organizing the trip makes a cash payment to the immigration officials at the airport to enable the students to move through immigration and begin their trip more quickly. This is a facilitation payment which is likely to be unlawful under the Act. The staff or members and the University would be liable for prosecution and the University may take disciplinary action against the employee.

Problem solving:

People do not go into government work to make a lot of money. Especially at the local level, elected officials might receive only a token payment for the number of hours they put into the job. In this context, it is tempting to say that tickets to the sporting arena or local performing arts center are well-deserved perks of office. Some even argue that attending such events is a part of the job and crucial to understanding the experience of citizens who utilize these venues.

On the other hand, such gifts may well influence officials when they need to determine whether the arena can add retail outlets that local businesses oppose or whether the performing art center should expand. Also, such gifts can create a slippery slope, with officials coming to expect VIP treatment and making local businesses feel pressurized into offering it so that they can receive a fair hearing.

By the same token, it is incumbent upon businesses to comply with the government regulations on gift giving. While it may be common in the private sector to acknowledge some important customers with extravagant holiday gift packages, this practice is disallowed in the public sphere, the gravel company that tries to reward the mayor of a city that has made a big purchase with 10 pounds of expensive chocolate simply puts the mayor in the most awkward position of returning the gift.

Interest in other companies :

This kind of conflict of interest arises when an employee develops interest in a competitor's or sub-contractor's business. For instance, working as an employee or consultant for a competitor and partial ownership or large stock holding in the business of competitors.

5.7 Occupational Crimes-industrial espionage-price fixing-endangering lives

Occupational crime

Occupational crimes are illegal acts committed through a person's lawful employment. It is the secretive violation of laws regarding work activities. When professionals or office workers commit the occupational crimes, it is referred as 'white collar crime'.

Most of the occupational crimes are special instances of conflicts of interest. These crimes are motivated by personal greed, corporate ambition, misguided company loyalty and many other motives. Even crimes that are aimed at promoting the interests of one's employer rather than oneself are also considered as occupational crime.

Occupational crimes impinge on various aspects such as professionalism, loyalty, conflicts of interest and confidentially.

Example: Three cases of occupational crimes that are commonly discovered.

1. Price fixing - Fixing a price for a commodity.

2. Endangering lives - Companies employ workers without disclosing them the harmful effects.

3. Industrial espionage - Industrial spying.

Espionage

Espionage is secret gathering of information in order to influence relationships between two entities. It is clandestine in nature and is considered immoral. It may appear contradictory that on the one hand, we have the right to expression and information and on the other; it is considered immoral to ferret out information. Since it involves stealing of intellectual property rights, it is considered harmful and immoral.

Secrecy exists and is maintained for the advantage of one over another. Keeping information secret has always been an effective means of ensuring success.

Keeping something secret is a right thing but acquisition of others secret to our advantage is espionage that is not right and ethical. The element of secrecy is the distinction between standard

intelligence gathering and espionage. Most of the information is gathered overtly. Espionage, however, is carried out entirely in a covert manner. Espionage is the effort to discover by clandestine methods the secrets of others.

It must be made clear that espionage is a secret act of information gathering and should not be confused with other covert activities such as sabotage and misinformation campaigns. In all forms of espionage, espionage agents called spies, who are trained and motivated individual dedicated to their mission, carry out the act of secretly gathering vital information.

Engineers from one country or from one organization are sent out as spies. People who inform or sell information are traitors. A spy is required to conceal his own true identity and mission. They have to use some immoral tactics. If caught, he has to deny his organizational affiliation. The ultimate goal of any spy is to steal secrets. For example, criminal acts like blackmail, bribery, coercion, burglary, murder are employed. This function is carried out in government and business organizations through out the world.

The practice is justified and accepted. Because of the clandestine nature of espionage and the fact that its ultimate goal is to steal secrets, it is perceived as most unethical and lawless activity. Using clandestine means to obtain secret information is ethically justifiable, however, if the end user of the gathered intelligence meets the goals and objectives of the society or organization in the larger interest. Espionage gathers the important information and places in the hands of authorities who use it to build a database of intelligence from which they can plan future decisions and actions. Almost all the countries and many companies have intelligence wings or spy for systematic gathering of the secret information.

Corporate espionage

How safe are corporate secrets? Espionage is fast becoming a serious problem for corporate and causing measurable losses. Corporate or industrial espionage is the theft of trade secret for economic gains. It involves theft of intellectual property such as designs, marketing plans, manufacturing processes, prototypes, prototypes and software codes. The threat to businesses due to corporate espionage has been on the rise.

Some statistic

American Society for Industrial Security has released statistics showing 589 occurrences of corporate espionage in 1,300 companies in the year 1996. The potential commercial value of this loss could be as much as USD 300 billion. In 1999 a survey by the American Society for Industrial Security and Price Waterhouse Coopers showed that fortune 1,000 companies had lost more than $45 billion from the theft of trade secrets. A survey published by CSL Federal Bureau of investigation put the losses of US companies due to theft of proprietary property at more than USD 170 million for 2001! In addition, this is a conservative figure, as 56% of the companies surveyed did not report a figure. The White House Office of Science and Technology reports that corporate espionage costs US companies a loss of USD 100 billion per year in sales.

Assessing losses

It is difficult to find accurate statistic on corporate espionage for obvious reasons. No company wants to admit that it was a victim of corporate espionage. They are afraid that such a statement acknowledging a breach in their security would cause their stock price to plunge.

A bank in a similar position would be afraid of a detailed scrutiny of its policies and systems from the federal government. Small businesses are afraid of their trade partners halting any further business on learning about a lapse in security.

Spy

Any person with access to confidential information having present or future value is a suspect for corporate spying. According to estimates, employees commit 85% of corporate espionage crimes. A newly hired person could be a competitor's man. A disgruntled employee may go to our competitor with vital information he already knows or has specifically gathered.

Then a member of cleaning staff may be bribed to hide a microphone in the conference room. Other 'spies' could be independent contractors and consultants. Joint ventures are another danger zone. The 1997 National Science and Technology Strategy have warned that technology transfers in the course of joint ventures with foreign companies raise concerns of economic and national security.

Travelling employees inadvertently becomes targets of corporate espionage. They continually complain about suspicious activities aimed at collecting information from them. There may be numerous cases of copying information from laptop computers or even stealing of laptops.

The danger

Corporate espionage poses a severe risk to any company's business. The various records that can be gathered to use against a company can include,

Client lists:

These could be sold to competitor or a sales person, he can use the information on to start his own company. This would affect the profitability of the company.

Personnel records

This information helps a rival to target or lure away key persons in the organizational. This would affect the processes in the company and hamper smooth functioning of work, results in important information being robbed through those employees who are lured away.

Price fixing

The American Government passed the Shonnan Antitrust Act in the year 1891 to stop the companies from jointly setting prices. During that period the price fixation was done by companies in a joint manner. It has held back free competition and trade. After this Act was passed, often it

had been violated in the electrical equipment industry where there were large contracts but only few competitor's.

The most famous violators case of the act had happened in two electric companies named as Westing House and General Electric. Top officials of these two companies and some other manufactures were caught for their involvement in price fixation without the knowledge of their proprietors. All the companies were fined a large amount and the persons involved in that were sentenced to imprisonment.

How they fixed the price was an interesting story. They allocated bids on the basis of the previous market shares of their companies. A company with 20% of the market share, would be allowed to submit the lowest bid for 20% of the new contracts. But they would not be given the contracts. The contracts were assigned on the basis of a rotating - plan which had a code-name as "phase of the moon".

The persons who participated in the price fixing game were highly reputed officials of their companies and in their communities. One of the persons was the president of the Local Chamber of Commerce.**Endangering lives**

Employers who expose their employees to safety hazards usually escape from criminal penalties. Victims can use the companies under the civil law, which makes them to get monetary compensation only. The companies which are responsible for the death of people can easily escape by paying compensation.

For example, in the Asbestos industry, asbestos fibers cause a lung disease named 'asbestosis' and an incurable cancer disease named 'mesothelioma'. In America, during 1940-1979, more than 25 million asbestos workers were found to be affected by such diseases and more than 1,00,000 workers dead.

The victims and their families filed suits against the asbestos companies for damages. seeking only monetary compensation and not criminal justice. In order to postpone the settlement, most of the industries filed for protection under bankruptcy. A court agreement was made that the companies could continue their operations by paying a large amount as compensation over the next 25 years. Thus, they escaped from the criminal case against the death of one lakh people and also they were allowed to continue their business by the court. The reason here is that the cases are filed only for monetary compensation for settlement.

The concept of white-collar crime draws attention to definitions of deviance. Edwin Sutherland initially coined the term "white-collar crime" in order to point out weaknesses in typical crime theory that considered social pathology as the primary explanation behind criminal behaviour. White-collar crime refers to crimes that are committed by "respectable people" during the course of their occupation. Crimes which are considered white-collar includes fraud, insider buying, falsification of expense accounts, embezzling, price fixing and theft of materials. This category of crime casts doubt on the notion that poverty breads crime.

Types of white-collar crime

Appelbaum and Chambliss calls attention into two types of white-collar crime.

Occupational crime

Occupational crime occurs when crimes are committed to promote personal interests. Crimes that fall into this category include altering books by accountants and cheating or overcharging clients by lawyers.

B. Organizational or corporate crime

A much more costly type of white-collar crime occurs when corporate executives commit criminal acts to benefit their company.

There are a variety of corporate crimes that include,

- Pollution.
- The creation of inferior products.
- Price fixing and
- Tobacco companies that add nicotine to cigarettes.

5.8 Whistle Blowing-types of whistle blowing-when should it be attempted-preventing whistle blowing.

Whistle blowing is the act of informing the public or higher management of unethical or illegal behavior by an employer or supervisor. It is the act of reporting on unethical conduct within an organization to someone outside of the organization in an effort to discourage the organization from continuing the activity.

According to the codes of ethics of the professional engineering societies, engineers have the professional right to disclose wrong doing within their organization and expect to take appropriate actions. Thus, in a way, whistle blowing is also one of the professional rights of engineers.

On the other hand, the employers/companies view whistle blowing as bad exercise. Because they feel that whistle blowing can lead to distrust, disharmony and an inability of employees to work together.

Whistle blowing definition:

Whistle blowing is alerting relevant persons to some moral or legal corruption, where ‘relevant persons’ are those in a position to act in response, if only by registering protest.

Whistle blowing occurs when an employee or former employee conveys information about a significant moral problem outside approved organization channels to someone in a position to take action on the problem.

Types of whistle blowing

The four type of whistle blowing are given below,

Internal whistle blowing:

Occurs when the information is conveyed to someone within the organization.

External whistle blowing:

External whistle blowing occurs when the information is passed outside the organization.

Open whistle blowing:

Open whistle blowing also known as acknowledged whistle blowing, occurs when the persons openly reveal their identity as they convey the information.

Anonymous whistle blowing:

Anonymous whistle blowing occurs when the person who is blowing the whistle refuses to reveal his name when making allegations.

Attempted:

Whistle blowing should be attempted only when the following four conditions are met.

1) Need

The whistle-blower should be very clear about the problems that are to be conveyed. Examples of important problems are critical offense, unethical policies or practices, injustices to the employees and threats to the environment.

2) Proximity

The whistle-blower should be in a very clear position to report the problem. The whistle-blower should have the expertise and firsthand knowledge about the problems.

3) Capability

The whistle-blower should have a reasonable chance of success in carrying out the whistle blowing. The whistle-blower should be able to take care the financial security of their family.

4) Last resort

Whistle blowing should be attempted only for extremely rare emergencies. First one should try to work out the problem through proper formal and informal organization channels.

Moral guidelines

Richard De George has provided a set of criteria that must be satisfied before whistle blowing can be morally justified. De George says that whistle blowing is morally permissible when the following three criteria are met.

1) If the harm that will be done by the product to the public is serious and considerable.

2) If the employees report their concern to their superiors.

3) If they are not getting satisfaction from their immediate superiors, they tire out the channels available within the organization.

De George believes that whistle blowing is morally obligatory when the following two criteria are met.

1) If the employee has documented evidence that would convince a responsible, impartial observer that his view of the situation is correct and the company policy is wrong.

2) If the employee has strong evidence that making the information public will in fact revert the threatened serious harm.

Prevention of whistle blowing

In order to solve the whistle blowing problem within a company, any one of the following four methods can be used.

1) The company should create a strong ethics culture within the organization. There should be clear commitment to ethical behaviour from both employers and employees.

2) The organizations should remove rigid channels of communication. Instead, they should encourage free and open communication system within the organization.

3) The companies can create an ethics review committee with real freedom to investigate complaints and make independent recommendations to the top management.

4) There should be willingness on the part of management to admit mistakes. If necessary, this attitude will set an atmosphere for employees ethical behaviour.

Global Issues

Globalization- Cross-culture Issues-Environmental Ethics-Computer Ethics-computers as the instrument of Unethical behaviour-computers as the object of Unethical Acts-autonomous computers-computer codes of Ethics-Weapons Development-Ethics and Research-Analysing Ethical Problems in Research-Intellectual Property Rights.

6.1 Globalization

Global networks such as the Internet and the conglomerates of business-to-business network connections are connecting the people and information worldwide. Such globalization issues that include ethics considerations include:

• Global business

• Global laws

• Global information flows

• Global education

• Information interpretation

• Information-rich and information-poor nations

The gap between the rich and poor nations and between rich and poor citizens in the industrialized countries is very wide. As educational opportunities, medical services, business and employment opportunities and many other necessities of life move more and more into the cyberspace, gaps between the rich and the poor may becomes even worse results in the new ethical considerations.

Globalization is the process of increasing the interconnections and linkages within the societies and across the geography, due to the improved communication and expanded world trade. It limits the differentiation wrought by the human cultural evolution and homogenizes health practices, diet and lifestyle. There are both beneficial and adverse consequences of the globalization process.

Globalization also presents the challenge to the development of ethics for practice and advocacy by food and nutrition professionals. Among the related terms, 'morals', 'values' and 'ethics', the latter connotes the basic rules of the conduct for interactions within the society and with the inanimate

environment which has the rules based on the recognized principles. The application of these principles is to resolve the ethical dilemmas that arise when more than one interest is at play.

Recognized ethical principles include autonomy, justice, beneficence, non-maleficence, utility and stewardship. These can be framed in the context of issues that arise during the advocacy for behavioural changes and material and to improve the nutritional health of the populations. At the global level, codes of good conduct and the construction of good food governance can be useful in institutionalizing the ethical principles in matters of eating practices and human diets.

Ethical dilemmas arise in the context of innate diversity among the populations and due to the polarity of the human physiology and metabolism practices which prevents some diseases will provoke other maladies. Moreover, the autonomy of an individual to exercise the independence will be addressing the treatment or personal health of the environment and may compromise the health of the individual's neighbours.

The challenges for the professional in pursuit of the ethical advocacy in a globalized era are to learn the fundamentals of ethical principles such as:

• To bear in mind a respect for difference and differentiation that continues to exist and which should exist, among the individuals and societies.

• To avoid the total homogenization of agriculture and food supplies.

6.1.1 Cross-culture Issues

Globalization/ cross-cultural variation:

Recent theorists conceive of globalization as linked to the growth of the social and cultural interconnectedness across the existing geographical and political boundaries. Globalization and cross-cultural diversity clearly opens up the opportunities for development.

Globalization is introducing and instilling the cross cultural values in the people. Globalization refers to the spread of new forms of non-territorial social activity. Human relations have become the diverse due to the increasing personal and workplace complexities. Many people from overseas are working in various organizations in Pakistan who come from different cultures. Similarly many Pakistanis are working overseas who have their own values and norms. This type of diversity may be useful in learning the new and more efficient ways of doing things.

If the individuals are better trained in accepting the cultural diversities, they will be more successful in their personal and organizational life.

Importance of cross-cultural differences:

The purpose of this is to provide the information that is useful for developing the effective working relationships with the people from cultures substantially different from our own. The cultural differences may exist within the same country or from different countries. Being able to work well

with the people from other cultures, both outside and inside our own country is important for the personal and organizational success.

Cross-cultural skills and attitudes:

Listed below are various skills and attitudes that various employers and the cross-cultural experts think are important for relating effectively to co-workers in the culturally diverse environment.

· At least one of my friends is deaf or blind or has some other handicap.

· I have spent some time in another country.

· I can read in the language other than my own.

· Currency from other countries is as real as the currency from my own country.

· I can write in the language other than my own.

· I can speak in the language other than my own.

· I use my second language regularly.

· I can understand the people speaking in the language other than my own.

· My friends includes the people of different ages.

· My friends include the people of races different than that of my own.

· My attitude is that although another culture may be very different from mine, that culture is also equally good.

· I feel comfortable having the friends with a sexual orientation different from mine.

· I would accept a work assignment of more than several months in another country.

· I appreciate the art from other countries.

· I have the passport.

6.2 Environmental Ethics

Environmental Ethics is the study to explore the ethical roots of the environmental movement and to understand ethics about one responsibility to the environment.

Example: Acid rains, Nuclear leaks accidents.

Environmental issues in the ethical point of view to engineers:

• Literally environmental ethics means conscious efforts to protect an environment and to maintain its stability from the hazardous pollutants.

• Environmental ethics is the study to explore the ethical roots of the environmental movement and to understand what ethics tells us about our responsibility to the environment.

•Whatever ethics can do for us when applied to non-environmental concerns, environmental ethics can do for we when applied to environmental concerns.

Engineers and the environment:

It is evident that engineers are usually creators of technology that contributes to environmental degradation as well as environmental improvement, therefore they should have a professional obligation to protect the environment. Also as agents of change and experimenters, engineers have a role to play in protecting the environment.

(a) Types of concern for environment

There are two types of concern for the environment.

i) Health-related concern:

Engineers can be concerned for the environment when environmental pollution posses a direct and clear threat to human health. This is called as a health-related concern for the environment.

ii) Non-health related concern:

Engineers can also be concerned for the environment even when human health is not directly affected. This concern is termed as non-health-related concern for the environment.

(b) Engineers concern for environment

While choosing a career or when taking up a new assignment/job, every engineers should ask himself the following ethical questions associated with the environment.

• How does and to what extent a particular industry affect the environment?

• How far such ill effects can be controlled physically and/or politically?

• What is the reasonable protective measures available for immediate implementation?

• In what way, I can be effective as an engineer, in ensuring safe and clean environment?

• What are my responsibilities in this regard?

• Should preserving the environment and its non-human inhabitants be regarded as of value for its own sake?

• Do I have obligations for the future?

• How are my obligations to the future to be balanced against my obligation to the present.

• Do I belong to nature or does nature belong to me?

• If animals can suffer and feel pain like humans, should I have moral standing?

Some of the professional codes of ethics regarding the environment are given below:

I. Engineers (ASCE) states: "Engineers should be committed to improving the environment development so as to enhance the quality of life of the general public".

II. The codes of the Institute of Electrical and Electronics Engineers (EEE) states: "Engineers have to accept responsibility in making engineering decisions consistent with the welfare safety and health of the public and to disclose promptly factors that might endangers the public or the engineers".

III. The codes of the American Society of Mechanical Engineer (ASME) States: "Engineer shall consider environmental impact in the performance of their professional duties".

Ethical climate:

A favorable working atmosphere required to achieve a morally responsible conduct is called as an ethical climate. Several factors such as nature of organization, informal traditions and practice and personal attitude directly contribute to the ethical climate.

6.3 Computer Ethics

Computer ethics is the study of ethical issues that are associated primarily with computing machines and the computing profession.

Computer ethics is a new branch of ethics that is growing and changing rapidly as computer technology that grows and develops. The term "computer ethics" is open to both interpretations, broad and narrow. On one hand, for example, might be understood very narrowly as the efforts of professional philosophers to apply traditional ethical theories like virtue ethics, Kantianism or utilitarianism to issues regarding the use of computer technology. On the other hand, it is possible to analyze computer ethics in a very broad way to include standards of professional practice, public policy, aspects of computer law, codes of conduct and corporate ethics and even certain topics in the psychology and sociology of computing.

In the industrialized nations of the world, the "information revolution" already has significantly altered many aspects of life in areas such as commerce and banking, employment and work, medical care, national defense, entertainment and transportation. Consequently, information technology has begun to affect community life, family life, human relationships, freedom, democracy, education and so on. Computer ethics in the broadest sense can be understood as that branch of applied ethics, which analyzes and studies such ethical and social impacts of information technology.

In recent years, this robust new field has led to many journals, conferences, articles, workshops, books, new university courses, curriculum, materials, professional organizations and research centers. And in the age of the world wide web, computer ethics is being quickly transformed into "global information ethics".

The introduction of the World Wide Web in 1990 has catalyzed the expansion of the internet, which is growing still today at unprecedented rates. The recent growth of internet has resulted not only in an increase in the amount of available knowledge, but in an increase in the problems inherent to its distribution and usage. It has become very clear that traditional rules of conduct are not always applicable to this new medium, hence new ethical codes are being developed now.

Ethics, in the classical sense, refers to the standards and rules governing the conduct of an individual with others. As the technology and computers became more and more a part of our everyday lives, we should understand that the problems that have always plagued business and conduct will continue to be a problem. In fact, a new medium can provide much more difficult questions of judgement. In other words, since the introduction of the World Wide Web, the definition of ethics has evolved, too. A new type of ethics called as computer ethics has emerged. Computer ethics is mainly concerned with standards of conduct as they pertain to computers.

Why computer ethics is needed?

• A more coherent body of law is needed to govern internet and computers.

• The existence of new questions that older laws cannot answer.

• The growth of the WWW has created several novel legal issues.

• Traditional laws are outdated or anachronistic in this world.

Three of the more pressing concerns in computer ethics today are questions of censorship, privacy and copyright. Other problems exist as well. One problem is that many domain names are being bought and sold to the highest bidder. For example, in recent times a man bought the name called www.drugs.com and auctioned it off.

Many people are purposely buying up company names and selling them to those companies at scandalous prices. President Clinton calls these people as Squatters and wants to pass a law prohibiting them to buy up already existing company names. Is this fair? Does these people have a right, under capitalism, to make money this way? Or is it near-blackmail? Many people have been tricked my e-mail scams, claiming that they will make us a millionaire. It is the same sort of pyramid scheme that exists over mail or telephone, but no laws covered it for a while. Also, many e-mail chain letters have allowed urban legends to spread at an accelerated rate and created alarm over hoaxes concerning many drug and food products. These e-mails only bog down email servers and systems, but do not seem to be ending. Some advertisers also e-mail unsolicited advertisements to email users, in a practice referred as spamming.

Computers present us not only with vast new potential in technology, but also in ethics. Morality should play catch-up to technology that has leap-frogged ahead. Without a knowledge of computer ethics, we will not be fully equipped to enter the new online society, and we will need to enter that world, whether we choose a career in art, business, programming or anything else.

Categories of computer ethics problems

The three broad categories of computer ethical problems are,

1. Those ethical problems for which the computer is the instrument of the unethical act. For example, the use of a computer to defraud the bank.

2. Those problems for which the computer is the object of the unethical act. For example, stealing computer software and installing it on one's own computer to access others information.

3. Those problems associated with the autonomous nature of computers.

Ten commandments of computer ethics

1. Thou shalt not snoop around in other people’s computer files.

2. Thou shalt not use a computer to harm other people.

3. Thou shalt not use a computer to steal.

4. Thou shalt not copy or use proprietary software for which we have not paid.

5. Thou shalt not use a computer to bear false witness.

6. Thou shalt not appropriate other people's intellectual output.

7. Thou shalt not interfere with other people's computer work.

8. Thou shalt not use other people's computer resources without authorization or proper compensation.

9. Thou shalt always use a computer in ways that insure consideration and respect for our fellow humans.

10. Thou shalt think about the social consequences of the program we are writing or the system we are designing.

6.3.1 Computers as the instrument of Unethical behaviour

Computers are sometimes used as an instrument for carrying out some unethical activities. The two important unethical acts under this category are:

1. Bank robbery

2. Privacy

1. Bank robbery

Computers can be used to steal from an employer. Outsiders can got into a system and steal from an institution such as a bank. In the same way, a company can use the computer to steal from its clients and customers. Computers are used more efficiently to steal money in a bank. The robber simply sits at a computer terminal, invades the bank's computer system and directs some of the banks assets placed in a location accessible to him. The use of computer makes the crime impersonal. The criminal never comes face to face with the victims.

2. Privacy

Privacy means the basic right of an individual to control access and use of information about himself. Computers make privacy more difficult to protect, since large amount of data on individuals and corporations are centrally stored on computers where an increasing number of individuals can access it. Invasions of privacy can be harmful to an individual in two ways as given below:

1. The leaking of private information can lead an individual being harassed or blackmailed.

2. Personal information can also be considered personal property. Any unauthorized use of this information is theft.

6.3.2 Computers as the object of Unethical Acts

When the computers are used as the objects of the unethical acts, ethical issues may arise. This act is presently known as “hacking”. Hacking is nothing but gaining unauthorized access to a database, implanting false information in a database or altering existing information and disseminating viruses over the internet.

In other words, hacking is a crime in which a person cracks a system and gains unauthorized access to the data stored in them. Accessing private information violates the private rights of individuals and corporations. Hacking has thrown a challenging threat to the internal security of a nation when hackers develop illegal access to the secret military information.

Computer viruses:

Viruses are programs introduced deliberately for destroying or altering the operating systems and database of computer. Transmission of computer viruses leads to the complete destruction of files and data stored in the computers. This type of destruction frequently occurs in the records of financial institutions, corporations, government offices and taxpayers.

6.3.3 Autonomous computers

Computer autonomy refers to the ability of computer to make decisions without the intervention of humans. This creates the ethical problems.

Examples: Wrong directed spaceship, Stock exchange automatically, etc.

6.3.4 Computer codes of Ethics

• Privacy should not be violated. In case of academic use, it is termed as plagiarism.

• Information stored on the computer should be treated as seriously as written or spoken word.

• Intrusive software such as "worms" and "viruses" which are destructive to the computer system is also considered as illegal.

• Information from public viewing should not be modified or deleted or inaccessible since these are considered as the destructive acts.

• Sending the obscene and crude messages through the mail or chat is also forbidden.

• Sending the sexually explicit content, message or pictures is also forbidden.

• Congesting somebody's system with a lot of unwanted information is also considered as unethical.

Various national and international professional societies and organizations have produced the code of ethics documents to give basic behavioral guidelines to computing professionals and users. They include:

• **Australian Computer Society:**

- ACS Code of Professional Conduct

- ACS Code of Ethics

• **Association for Computing Machinery:**

- ACM Code of Ethics and Professional Conduct

• **Computer Ethics Institute:**

- Ten Commandments of Computer Ethics

• **British Computer Society:**

- Code of Good Practice

- BCS Code of Conduct

• **League of Professional System Administrators:**

- The System Administrators' Code of Ethics

• **IEEE:**

- IEEE Code of Conduct

- IEEE Code of Ethics

6.4 Weapons Development

Engineers join military services shows their patriotism and interest. They also refuse because it may be unethical. They have to developed compromising attitudes about their involvement though they are aware of consequences of war weapons. They should think morally before getting involved in weapon's production.

Engineer should examine both his individual conscience and the social and political issues of weapons technology, before involving in the weapons development.

Engineer's involvement in weapon's development

The Military or Defense Industry uses most of world's latest technological activity. The entire world spends much of its money in the new development of military weapons. Engineers involve either directly or indirectly in designing and developing of these new weapons. There are several reasons for an engineer to join the military services. The first and foremost reason is that of patriotism and prudential interest. The later can be threats or compulsion from the government or the ruler of the country.

There are also several reasons for an engineer to refuse the war work. Because fundamentally the purpose of designing war weapons is to kill human beings. Therefore, many reasonable engineers feel that the activity of weapons development as unethical. Every engineer has to decide by examining his or her own conscience whether to work or not to work in defense-related industries.

Role of engineers in defence industry

Defense industry is one of the areas, which provide number of jobs opportunities to engineers. Engineers are capable of innovating and developing new weapons. Weapons are designed for one purpose - to kill human beings.

On the one hand, many of the rational engineers feel that they cannot work on designing weapons, which are ultimately used to kill the human beings. Even though they are not the ultimate users of those weapons, they find it morally unacceptable to work on such areas.

On the other hand, similar morally responsible engineers feel that working in defense industry is ethical. Because they feel it as a , honor to work for their nation/government. In fact, the above two different views about working in defense industry are well justified by various ethical theories. Also the engineers should not be attracted by incentives and advancements that are being offered in the defensive industries, they must have the potential judgments to serve in defense works.

Engineers involvement in weapons work

Engineers, who have engaged themselves in manufacturing of war weapon and anti personal bombs, have developed compromising attitudes about their involvement, though they are aware of consequences of war weapons. Sometimes, engineers are forced to involve in weapons work for their survival and livelihood of their family members. Thus, every engineer who accepts job in a war-related industry should seriously consider his or her motives in doing so. They should think morally before getting involved in weapon's production.

Defense industry problems

Many nations give privileges to defense industry, without even thinking, on serious problems that arise in large military build-ups. Some of the problems are:

1) The problem of waste and cost overruns is a major one in the defense industry.

2) Another problem faced by the defense industry is the ‘technology creep'. The technology cheep refers to the development of new weapons, such as the cruise missile, which can change diplomatic arrangements even as they are being negotiated. Thus it affects the political stability of a country.

3) Secrecy creates problems for the defense industry. If the secrets of planned funding were leaked to prospective contractors, then it may lead to high cost and poor quality of defense materials and weapons.

4) Many countries allocate funds for the defense sector than that of the other public welfare schemes.

6.5 Ethics and Research

Ethics in research are very important when we are going to conduct an experiment.

Ethical standards

Researchers should,

• Not use the deception on people participating, as the case with the ethics of the Stanley Milgram Experiment.

• Avoid any risk of considerably harming the people, the environment or property unnecessarily. Tuskegee Syphilis Study is the example of a study which seriously violated these standards.

• Preserve the privacy and confidentiality whenever possible.

• Obtain the informed consent from all involved in the study.

• Not offer big rewards or enforce the binding contracts for the study. This is especially important when people are somehow reliant on the reward.

• Take special precautions when involving populations or animals which may not be considered to understand the purpose of the study.

• Not skew their conclusions based on the funding.

• Not plagiarize the work of others.

• Not use the position as a peer reviewer to give sham peer reviews to punish or damage the fellow scientists.

• Not commit the science fraud, falsify the research or otherwise conduct scientific misconduct. A con-study, which devastated the public view of the subject for decades, was the study of selling

more coke and popcorn by unconscious ads. The researcher said that he had found the great effects from subliminal messages, whilst in fact, he had never conducted the experiment.

Basically, research must follow all regulations given and also anticipate possible ethical problems in their research.

Competition is an important factor in research and may be both a good thing and a bad thing.

Whistle blowing is one mechanism to help discover misconduct in research.

6.5.1 Analysing Ethical Problems in Research

Ethical issues

The principle of voluntary participation requires that people not be forced to participate in the research. This is especially relevant where the researchers had previously relied on the 'captive audiences' for their subjects such as prisons, universities and places like that. Closely related to the notion of voluntary participation is the requirement of the informed consent. Essentially, this means that the prospective research participants must be fully informed about the procedures and risks involved in the research and must give their consent to participate.

Ethical standards also require that the researchers not put participants in a situation where they might be at risk of harm as the result of their participation. Harm can be defined as both the physical and psychological. There are two standards that can be applied to protect the privacy of the research participants. Almost all the research guarantees the participants confidentiality. They are assured that the identifying information will not be made available to anyone who is not involved directly in the study.

The stricter standard is the principle of anonymity which essentially means that the participant will remain as anonymous throughout the study even to the researchers themselves. Clearly, the anonymity standard is the stronger guarantee of privacy, but it is sometimes difficult to accomplish, especially in the situations where the participants have to be measured at multiple time points. Increasingly, researchers deal with the ethical issue of a person's right to service.

Good research practice often requires the use of a no-treatment control group which is a group of participants who do not get the treatment or program that is being studied. But when that treatment or program may have the beneficial effects, persons assigned to the no-treatment control may feel their rights to equal access to services are being curtailed.

Even when the clear ethical standards and principles exist, there will be times when they need to do the accurate research runs up against the rights of the potential participants. No set of standards can be possibly anticipate every ethical circumstance.

Furthermore, there needs to be a procedure that assures that the researchers will consider all the relevant ethical issues in formulating the research plans. To address such needs, most institutions and organizations have formulated the Institutional Review Board (IRB), a panel of persons who

reviews the grant proposals with respect to the ethical implications and decides whether the additional actions need to be taken to assure the rights and safety of participants. By reviewing the proposals for research, IRB's also helps to protect both the researcher and the organization against the potential legal implications of neglecting to address the important ethical issues of the participants.

6.6 Intellectual Property Rights

The legal rights build up on the intellectual property created are known as Intellectual Property Rights (IPR).

Elements of Intellectual Property Rights (IPR's):

A. Patents

B. Industrial designs

C. Trade marks

D. Copy rights

E. Trade secrets

F. Design of integrated circuits

G. Geographical indications

The World Trade Organization (WTO) has established seven elements of IPRs, which were agreed by TRIPs(Trade Related Intellectual Property Rights System). They are:

I. Patents:

Patents are the legal rights approved for new inventions involving scientific and technical knowledge. Patent means an official document giving the holder the sole right to make, use or sell an invention and preventing others from copying it.

II. Industrial designs:

It is the right to safeguard one's industrial designs. A design is an idea or conception as to the features of shape, configuration pattern ornament of composition of lines or colors applied to any article, two or three dimensional or both by any industrial process or means which in the finished article appeals to and is judged solely by the eye or product.

III. Trademarks:

It means a registered design or name used to identify a company's goods and to indicate the public the origin of manufacture of the goods affixed with that mark.

Examples: Pepsi is a registered trademark in soft drinks and Nestle in food products.

IV. Copy rights:

It means the legal right held for a certain number of years to print, publish, sell, broadcast, perform, film or record an original work or any part of it. It protects the expression of the idea, not the idea themselves.

Examples: Poems, Paintings and Computer programs.

V. Trade secrets:

Trade secret means a device or technique used by a company in manufacturing its products etc. and kept secret from other companies or the general public. Trade secrets such as formulas, patterns, methods and data compilations are kept secret in order to gain a competitive advantage over competitors.

Examples: The formula of Fanta soft drink and the formulas for making drugs.

VI. Design of integrated circuits:

It is the right granted to the inventor to prevent anybody making use of the design of integrated circuits, semiconductor devices and other electronic devices.

Example: Invention of a new microprocessor chip.

VII. Geographical indications:

It identify goods as originating in the territory of a country, an origin or a locality in that territory, where a specific quality, reputations or other characteristics of the goods is essentially attributed to their geographical origin.

Examples: Tirunelveli halwa, Dindugal locks, Sivakasi crackers, Kancheepuram sarees.

Discrimination

Discrimination is a morally unjustified treatment of people on arbitrary or irrelevant grounds.

I. Unequal treatment among employee based on religion.

II. Communal classifications.

Benefits of IPR's:

• The IPR's promote technological, industrial and economical development of a country.

• IPR's provide incentives for the inventions and ensure adequate returns on commercialization of the invention.

• IPR's prevent the competitors from using one's invention.

• IPR's are useful in identifying unprotected areas to avoid violation.

• IPR's grant exclusive rights to the inventors.

• IPR's provide use the invention for the public purpose.

• IPR's are useful in identifying an explored areas for identifying and undertaking research so as to become a leader in that area.