HARMONY IN THE PROFESSIONAL ETHICS

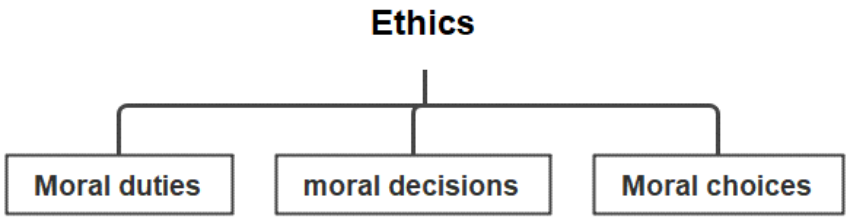
ETHICS

Ethics is a set of principles or standards of human conduct that govern the behaviour of individuals or organizations. By these ethical standards, a person or a group of persons or an organization regulate their behaviour to distinguish between what is right and what is wrong as perceived by others.

Philosophically speaking, ethics is concerned with what is morally right and morally wrong in a given field of human activity.

In short, we can propound the following definitions for ethics.

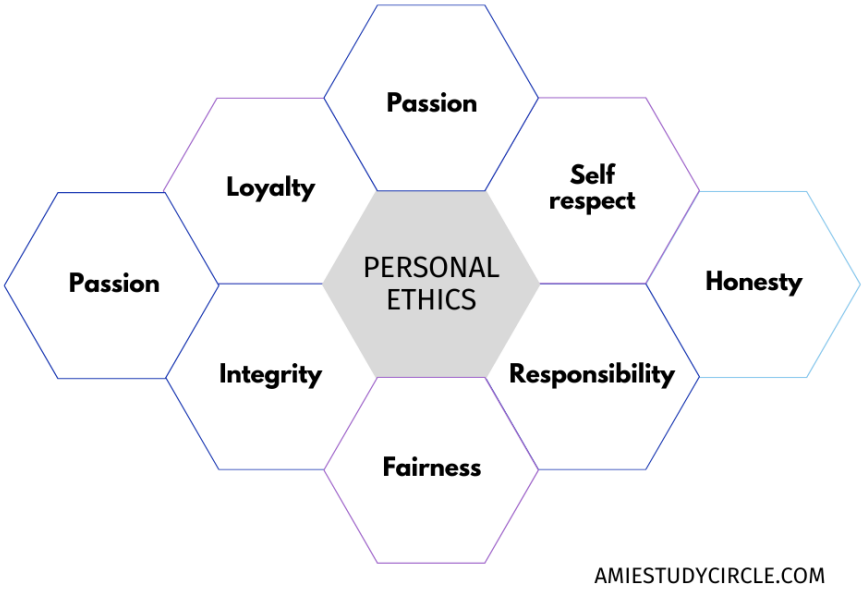
- Ethics can be defined as the discipline dealing with the moral duties and an obligation explaining what is good or not good for others and us.
- Ethics is the study of moral decisions that are to be made by us in the course of performance of our duties.
- Ethics is the study of characteristics of morals and deals with the moral choices that are made in relationship with others.
- Ethics is concerned with truth and justice considering a variety of aspects like the expectations of the society, fair competition, public relations, social responsibilities, and corporate behaviour.



PERSONAL ETHICS

- Personal ethics deals with how we treat others in our day-to-day lives. Many of these principles are applicable to ethical situations that occur in business and engineering.

- Personal ethics is the set of standards of one's own commitment and interpretation of moral and immoral acts, usually based on the early training received at home.
- If an engineer refuses to design a military hardware because he is against war, this is personal ethics rather than professional ethics or common morality.



PROFESSIONAL ETHICS

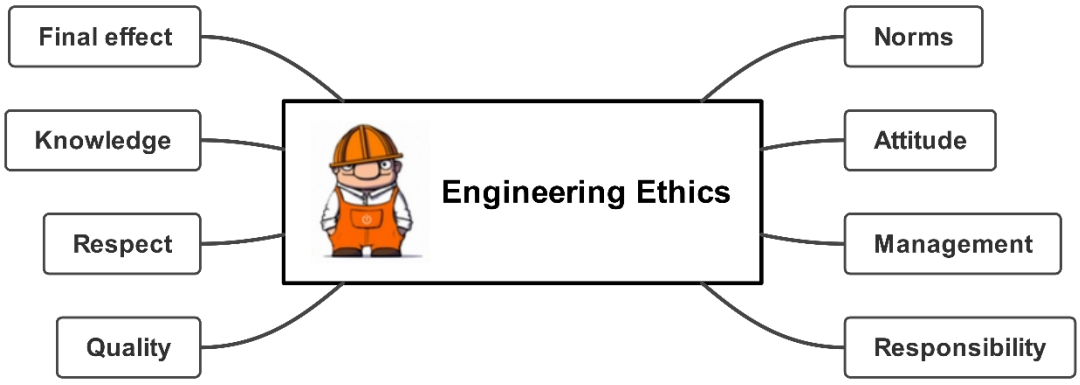
- Professional ethics often involves choices at an organizational level than at the personal level. It involves relations between two organizations, between the corporation and the government, or with the society or between groups of individuals.
- Professional ethics is a set of standards adapted by professionals in so far as they see themselves acting as professionals.
- If the engineer refuses to develop a process that results in excessive pollution of the environment, he is following professional ethics, personal ethics, and common morality.



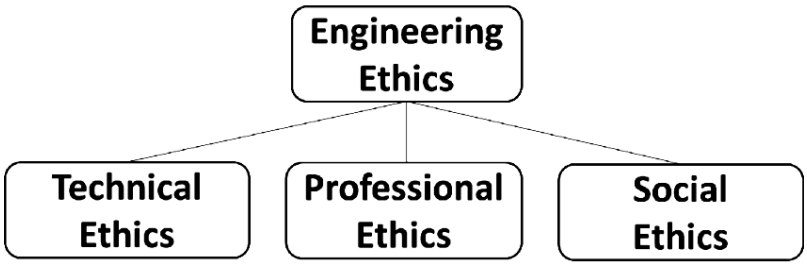
ENGINEERING ETHICS

Engineering Ethics is the activity and discipline aimed at

- understanding the moral values that ought to guide engineering profession or practice,
- resolving moral issues in engineering, and
- justifying the moral judgments in engineering. It deals with set of moral problems and issues connected with engineering.



Engineering ethics is defined by the codes and standards of conduct endorsed by engineering (professional) societies with respect to the particular set of beliefs, attitudes and habits displayed by the individual or group.



Another important goal of engineering ethics is the discovery of the set of justified moral principles of obligation, rights and ideals that ought to be endorsed by the engineers and apply them to concrete situations. Engineering is the largest profession and the decisions and actions of engineers affect all of us in almost all areas of our lives, namely public safety, health, and welfare.

IMPORTANCE OF ETHICS

Several notorious instances, accidents, or scams, or other impacts caused because of simple negligence of duties due to lack of appreciation of responsibilities have attracted a great deal of attention that led engineers to gain an increased sense of their professional ethos and responsibilities.

Examples

- Overconfidence and lack of sufficient safe exits (Titanic disaster)
- Impatience (explosion of Challenger Space Shuttle)
- Poor maintenance (Bhopal gas tragedy)
- Ignoring obvious safety hazards (Chernobyl Nuclear Power Plant explosion)
- Disregard to basic safety equipment and safe exit (Delhi Theatre fire accident)
- Letting unskilled and untrained labour handle highly explosive material under poor supervision (Sivakasi fire accidents)

SENSES OF ENGINEERING ETHICS

Through Enquiry

This means that ethics is an activity where we seek to learn and understand the moral values by inquiring and analyzing into certain practices. These moral values, when understood, would guide us in resolving moral issues in and justifying the moral judgments we make. Engineering Ethics, in this sense, refers to the activity aimed at understanding moral values that guide us in performing our engineering practices and justifying the moral judgments we make as engineers.

Distinction of Moral Issues from Nonmoral Issues

Here, the term ethics makes a contrast between moral issues and nonmoral issues of say political, legal or artistic in nature, which are at a different level and concept than from those of engineering profession. A clear distinction is sought to differentiate between illegal activities, immoral activities, unethical activities, and wrongful activities. Engineering ethics, in this sense, refers to a set of moral issues faced by the engineer during the day-to-day practice of his/her profession.

Codes of Conduct

In some cases, ethics may refer to certain established codes of practices, beliefs, etc., displayed to maintain morality. When we say ethics of Panchatantra, or ethics of Ramana Maharshi, we mean the ethics or moral values illustrated or preached by them. Similarly, we can say Greek ethics, Martin Luther ethics, Gandhian ethics, and so on.

A Synonym for 'Morally Correct'

This is like saying someone is acting ethically or unethically. In this usage, engineering ethics refers to how a professional adheres to the codes with reference to his/her responsibilities, obligations, rights, and ideals, which may vary significantly from person to person. Such variances too are sometimes specified in the codes of practices.

ETHICAL ISSUES

Ethical issues are the typical day-to-day decision problems faced by the engineer, like deciding on the safety factor and his attitude in his perception of the probability of the accidents. In this case, the engineer does not have any selfish motive but it is his attitude that magnifies the issue.

Ethical issues can also refer to professionally virtuous conduct whereas moral issues refer to virtues centered on selfishness or sexual desire.

MORAL ISSUES

Moral issues are those when the engineer deliberately takes a wrong decision motivated by some self-interest, like wanting higher profits to the company or accepting a bribe or any form of corruption.

Example

Give two examples illustrating the distinction between ethical and moral issues.

Answer

Example #1

An engineer finds a certain material-handling equipment faulty and recommends it to be taken off the line. However, the production manager believes it is too minor to afford production holdup. Here, the difference in ethical thinking is due to the differences in the judgment of what constitutes the true state of affairs. However, if some mishap occurs and the production manager passes on the blame to the poor maintenance of the equipment then he is immoral.

Example #2

A certain bicycle factory lets its waste oils into the public sewage pipelines. This is unethical but may not be immoral if no law exists prohibiting this. But if a notice has been received from the Pollution Control Board or the Municipal Corporation and if the company takes no action, it is immoral.

HOW DO MORAL ISSUES (PROBLEMS) ARISE IN A PROFESSION

Resource Crunch

Due to pressure, through time limits, availability of money or budgetary constraints, and technology decay or obsolescence. Pressure from the government to complete the project in time (e.g., before the elections), reduction in the budget because of sudden war or natural calamity (e.g., Tsunami) and obsolescence due technology innovation by the competitor lead to manipulation and unsafe and unethical execution of projects.

Involving individuals in the development of goals and values and developing policies that allow for individual diversity, dissent, and input to decision-making will prevent unethical results.

Opportunity

- Double standards or behaviour of the employers towards the employees and the public. The unethical behaviours of World Com (in USA), Enron (in USA as well as India) executives in 2002 resulted in bankruptcy for those companies,
- Management projecting their own interests more than that of their employees. Some organizations over-emphasize short-term gains and results at the expense of themselves and others,
- Emphasis on results and gains at the expense of the employees, and
- Management by objectives, without focus on empowerment and improvement of the infrastructure.

This is **best encountered by** developing policies that allow '**conscience keepers**' and **whistle blowers** and **appointing ombudsman**, who can work confidentially with people to solve the unethical problems internally.

Attitude

Poor attitude of the employees set in due to

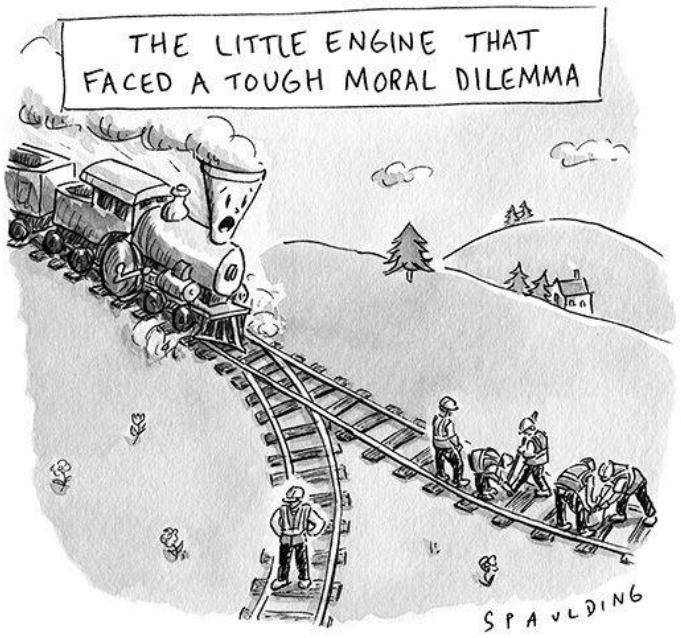
- Low morale of the employees because of dissatisfaction and downsizing, (b) Absence of grievance redressal mechanism,
- Lack of promotion or career development policies or denied promotions,
- Lack of transparency,
- Absence of recognition and reward system, and
- Poor working environments.

Giving ethics training for all, recognizing ethical conduct in work place, including ethics in performance appraisal, and encouraging open discussion on ethical issues, are some of the directions to **promote positive attitudes** among the employees.

To get firm and positive effect, ethical standards must be set and adopted by the senior management, with input from all personnel.

MORAL DILEMMA

A moral dilemma presents a difficult decision-making scenario where there is no obvious or easy solution that aligns perfectly with one's ethical principles. Moral dilemmas often involve conflicting values, obligations, or duties, forcing individuals to weigh the potential harm or benefit associated with each option. For example, a person promised to meet a friend and dine, but he has to help his uncle who is involved in an accident — one has to fix the priority.



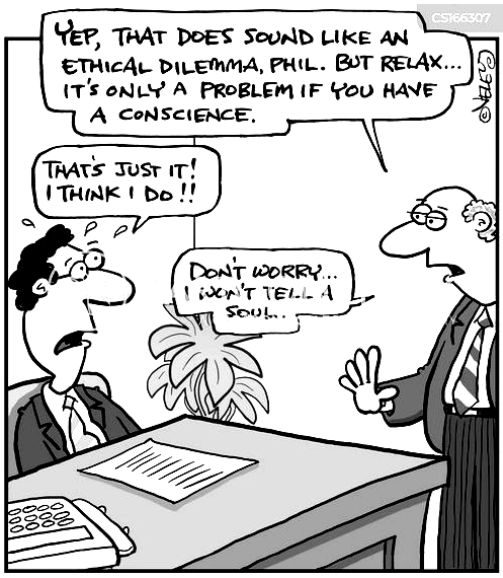
Situations leading to moral dilemmas

- **Vagueness**: One is unable to distinguish between good and bad (right or wrong) principle. Good means an action that is obligatory. For example, code of ethics specifies that one should obey the laws and follow standards. Refuse bribe or accept the gift, and maintain confidentiality
- **Conflicting reasons:** One is unable to choose between two good moral solutions. One has to fix priority, through knowledge or value system.
- **Disagreement**: There may be two or more solutions and none of them mandatory. These solutions may be better or worse in some respects but not in all aspects. One has to interpret, apply different morally reasons, and analyze and rank the decisions. Select the best suitable, under the existing and the most probable conditions.
- **Due to Conflicting Instructions** On many occasions, an employee has to obey two bosses, each giving contradictory instructions. Example: Your immediate boss gives you, as a production engineer, a task to be completed by afternoon, whereas your GM gives you another task to be completed on priority.
- **Due to Lack of Experience and Skill** Several times, a fresh engineer faces moral dilemmas in taking decisions due to his lack of experience or skill. Example: This is exactly what happened in the case of Challenger spaceship launch. The engineers

pointed out the possibility of failure of the O-rings but the boss was in disagreement and overruled it.

Moral dilemma examples

- **Exposing Your Best Friend:** The person is in a supervisory position but recently discovered that his best friend has been faking the numbers on several sales reports to boost his commissions.
- **Tricking a Loved One with Alzheimer's:** In this scenario, a loved one has been placed in a special residential center, which is expensive. Their children don't have the funds to pay, but the loved one does. Unfortunately, the only way to access those funds is to trick the loved one into revealing their bank account information.
- **Selling a Used Car:** The person has two close friends. One is considering buying a car from the other. They know the car has a serious problem with the engine, but their friend is not disclosing it.



Steps to Solve Dilemma

- **Identify the Dilemma:** Clearly recognize and define the moral dilemma you are facing. Understand the conflicting principles or values involved.
- **Consider Consequences:** Evaluate the potential consequences of each possible action. Assess the impact on individuals, relationships, and the broader community.
- **Seek Guidance:** Consult with trusted friends, mentors, or ethical advisors to gain different perspectives and insights on the situation.

- **Reflect on Values:** Reflect on your own values and principles. Consider how each option aligns with your personal and ethical beliefs.
- **Explore Alternatives:** Look for alternative solutions that may help mitigate the conflicting principles. Consider compromise or creative problem-solving.
- **Prioritize Ethical Principles:** Prioritize ethical principles based on their importance in the given context. Determine which principles should take precedence.
- **Consider Long-Term Impact:** Think about the long-term consequences of your decision. Consider whether your choice aligns with your values and contributes to the greater good.
- **Take Time if Possible:** If the situation allows, take some time to reflect before making a decision. Rushed decisions may lead to regrettable outcomes.
- **Maintain Integrity:** Strive to make a decision that aligns with your values and maintains your personal integrity. Avoid compromising core principles for short-term gains.
- **Accept Responsibility:** Accept responsibility for your decision and its consequences. Acknowledge that moral dilemmas often involve tough choices and are rarely easy.
- **Learn from the Experience:** Regardless of the outcome, view the situation as a learning experience. Reflect on how you can apply lessons from the dilemma to future moral challenges.

Example (Moral/ethical dilemma)

The following news item appeared in Times of India of 1st September 2013, perhaps referring to an incidence that occurred during the last week of August 2013.

Two kittens have been rescued after shutting down New York City subway for more than an hour. Metropolitan Transportation Authority bosses cut power of two lines in Brooklyn when the cats were spotted on the track. Delays continued in both directions as rail staff were sent to rescue the kittens.

Public service announcement were made as the search continued for more than an hour. One conductor told frustrated commuters, "There is no service in Manhattan on two lines because if cats and kittens on the track at Church Avenue.

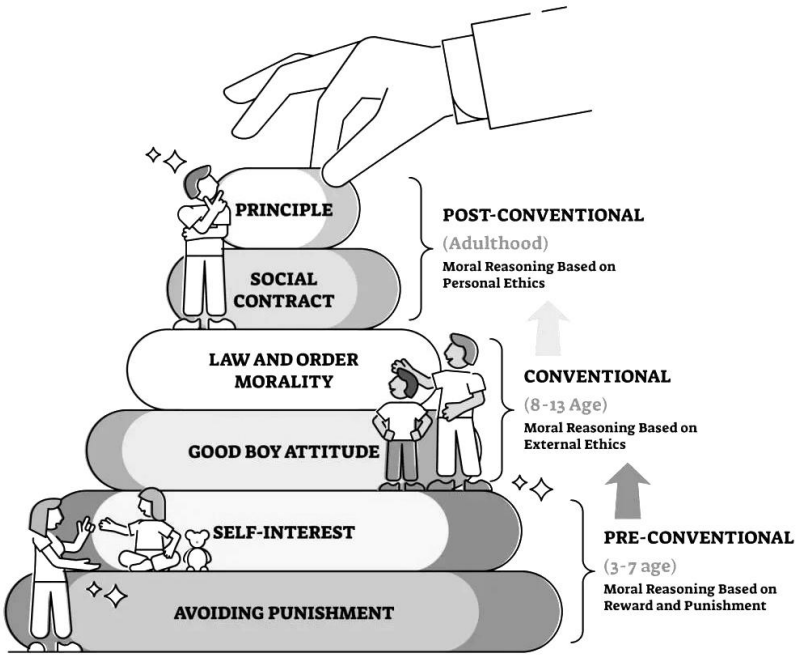
Eventually a rail worker and two police officers captured the kittens and put them in a milk crate. Some passengers vented their anger that services had been cut to rescue the animals.

*This is an illustration for the **ethical dilemma** faced by the Metropolitan Authorities under a conflict of interests between the commuters and the directive from SPCA (Society for Prevention of Cruelty to Animals).*

MORAL DEVELOPMENT THEORIES

Kohlberg Theory

Moral development in human being occurs overage and experience. Kohlberg suggested there are three levels of moral development, namely pre-conventional, conventional, and post-conventional, based on the type of reasoning and motivation of the individuals in response to moral questions.

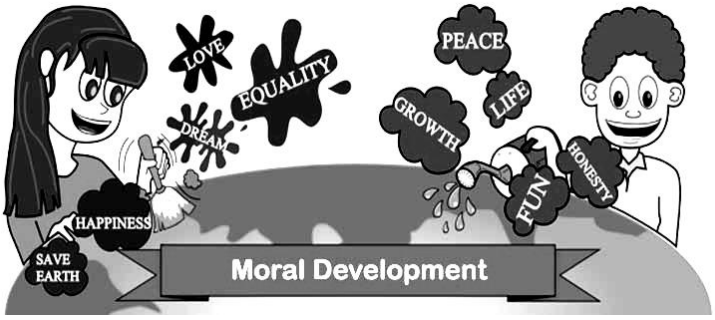


- **Pre-conventional Level** In the pre-conventional level, right conduct for an individual is regarded as whatever directly benefits oneself. At this level, individuals are motivated by obedience or the desire to avoid punishment or to satisfy their own needs or by the influence by power on them. This is comparable to the level of development of children and a few adults whose mental growth is slow.
- **Conventional Level** Norms of one's family, group, or society are accepted as ethical requirements. One is motivated by the desire to please others and for close identification with others. This is at some cost of his self-interest. Recognition of good and bad, and fear of law and order are developed in this level. A majority of adults grow to this stage. This is at some cost of his self-interest. Recognition of good and bad, and fear of law and order are developed in this level. A majority of adults grow to this stage.
- **Post-Conventional Level** At the post-conventional level, people are called autonomous. They live by principled conscience. They clearly understand the principles

of ethics, the rights and wrongs, and also their duties and responsibilities to society. They cannot accept unethical practices of others and do their best to tutor others.

Gilligan's Theory

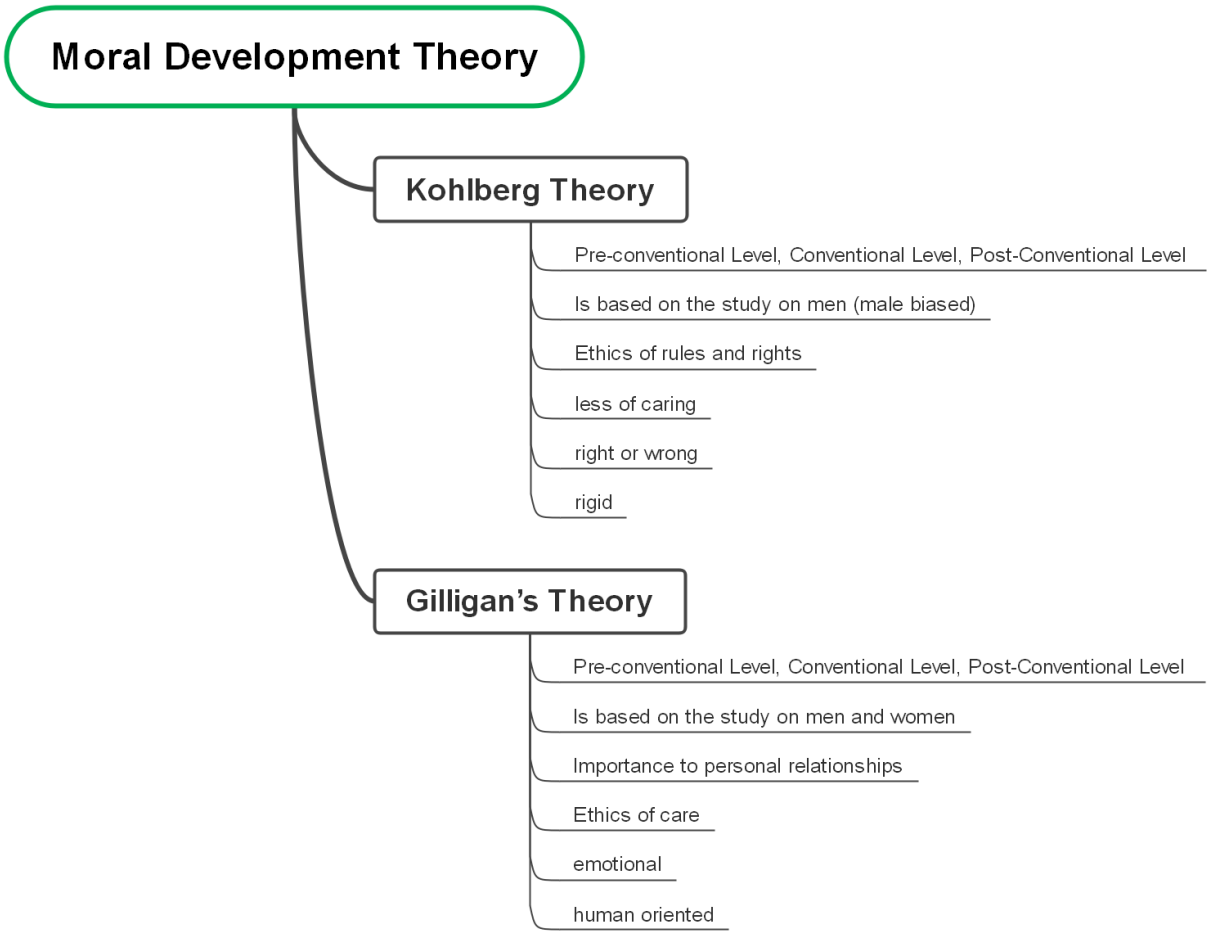
Carol Gilligan found that Kohlberg's theory had a strong **male bias**. According to Gilligan's studies, men had a tendency to solve problems by applying abstract moral principles. Men were found to resolve moral dilemma by choosing the most important moral rule, overriding other rules. In contrast, **women** gave importance to preserve personal relationships with all the people involved. The context oriented emphasis on maintaining personal relationships was called the **ethics of care**, in contrast with the ethics of **rules and rights adopted by men**.



Gilligan **revised** the three levels of moral development of Kohlberg, as stages of growth towards ethics of caring.

- **Pre-conventional Level** The pre-conventional level, which is same as that of Kohlberg's first one, right conduct, is viewed in a selfish manner solely as what is good for oneself.
- **Conventional Level** The second level called conventional level, the importance is on not hurting others, and willing to sacrifice one's own interest and help others. This is the characteristic feature of women.
- **Post-Conventional Level** At the post-conventional level, a reasoned balance is found between caring about others and pursuing the self-interest. The balance one's own need and the needs of others, is aimed while maintaining relationship based on mutual caring. This is achieved by context-oriented reasoning, rather than by hierarchy of rules.

A mind map is given below.



HEINZ'S DILEMMA

The difference in these two theories is explained through the well-known example, Heinz's dilemma. Heinz, a poor man, whose wife was suffering from cancer and a very costly drug was prescribed to treat her. He struggled hard to get the money for it but failed, and even the druggist refused to lend the drugs to him. Finally, with no other choice left to save his wife, he entered the pharmacy and stole the drug.



In fact, it is this case study that **Kohlberg** used in his experiments to question several people on whether Heinz was morally right or wrong. The men gave two sets of responses. One set of opinion was based on conventional-level thinking, saying Heinz was wrong, while the second set of opinion was based on post-conventional thinking, saying Heinz was right as the life of his wife was more important than the proprietary right of the pharmacist. This is like saying 'he is ethically right though morally wrong'.

On the other hand, in **Gilligan's** study, a majority of the women gave the conventional opinion that Heinz was wrong. He could have tried other methods like convincing the pharmacist further than stealing.

ENGINEERING AS EXPERIMENTATION

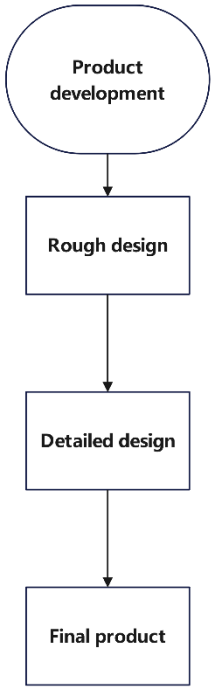
The function of the engineer is to develop new products and processes. Since each stage of the design or development is experienced for the first time, there are uncertainties at every stage and the engineer is bound to make presumptions either from data books or from his experience.

These uncertainties can be in the form of

- Models used for the design calculations
- Performance characteristics of the materials
- Inconsistencies in the materials purchased
- Nature of the pressure the finished product will encounter

His success lies in his capacity to accomplish his task with this partial knowledge. This brings forth the need to develop prototype or simulation models at every stage and conduct experiments to test them.

Rough designs are thus developed from simulation tests conduced from time to time which form the basis for developing more detailed designs, till the final product or the process emerges.



Thus, it is clear that every engineering activity is based on experimental processes. These experiments are done not only in the laboratory but also in the field from the point of view of public safety and performance.

THE ENGINEER AS A RESPONSIBLE EXPERIMENTER

As per Murphy's law, if anything is to go wrong, it will go wrong, sooner or later. It means that all products of technology present potential hazards to some extent due to failure, making engineering a risky activity. Thus, each engineering project, whether development of processes or setting up a new plant or building a new railway track or even preparing for launching a luxury cruiser like Titanic with a full load of passengers should be viewed as an experimental process. Before introducing to the public, every engineering product must undergo various experiments not only in the laboratory but also from the point of safety to the public, especially wherever the lives of several people are involved. *That is the reason why the engineer is called not only an experimenter, but a responsible experimenter* in view of his concern for public safety as he is experimenting with his design with the society at stake.

The engineer, being a responsible experimenter, should bear in mind and appreciate fully the fact that the experiments are to be done from the society and safety point of view.

His major duty is to protect the safety of human beings and respect the rights of consent.

- He should have a clear awareness of the experimental nature of the project, forecasting its possible side effects.
- He should monitor these effects, or side effects, meticulously and record any significant issues that arise.
- He should ensure full personal involvement in all the steps of the project.
- He should have a fairly well-developed moral autonomy. His moral beliefs and attitudes must be held only on basis of critical reflection rather than merely through the passive adoption of the
- conventions of the society.
- He should be accountable for the results of the project.
- He should exhibit their technical competence and other characteristics of professionalism.

LEARNING FROM THE PAST

Engineers normally learn from their own prior designs and infer from the analysis of operation and results, and sometimes from the reports of other engineers. But this does not happen frequently. The absence of interest and channels of communication, ego in not seeking information, guilty upon the failure, fear of legal actions, and mere negligence have caused many a failure, e.g., the Titanic lacked sufficient number of life boats—it had only 825 boats for the actual passengers of 2227, the capacity of the ship being 3547! In the emergent situation, all the existing life boats could not be launched.

Collision of Ships with Bridges

Ships are known to brush against bridges under which they pass, and cause minor or major damages to the ships and the bridges. This happened in 1964 at the Maracaibo bridge at Venezuela and similarly in 1975 at Tasman bridge in Australia.

These incidents should have given sufficient time and precedence for bridge engineers as well as marine engineers to learn from the past. Yet, in 1980, a moving ship hit the Sunshine Skyline Bridge in Sweden due to the unexpected horizontal impact forces. Couldn’t this have been foreseen and avoided?

Fire Accidents in Fireworks Manufacturing Units

In India, Sivakasi in Tamil Nadu is the center for the manufacture of fireworks. Every year, millions worth of crackers and fireworks are manufactured by hundreds of small units and supplied throughout India.

Nevertheless, these units are based on age-old technology, and methods of manufacture involve thousands of unskilled labour including women and children who are employed for filling the containers with explosive powders by hand. This makes them highly exposed to explosion and fire hazards and hundreds are reported to be killed every year. The latest accident is the fire on 2 June, 2005, at a fireworks unit near Sivakasi.

Despite the obvious hazardous working conditions and processes, and heavy death toll year after year, no one—neither the owners nor the Government departments nor other NGOs—have learnt from the past to develop safety standards and enforce them in these units. The gist of a newspaper report can be cited as illustration:

> *There are many (fireworks) units in this (Sivakasi) region and we find workers dying every month. These mishaps do not make news as the factory owners silence the bereaved families with money. Most of the cracker units do not follow the mandated safety norms. They set aside some money (which is a pittance compared to the legal compensations) to accident victims rather than spend larger sums on creating fireproof infrastructure. While it is stipulated that the factories should have fire extinguishers in adequate number in all the rooms, a bucket of water, often empty, is all that can be sighted in the rooms where the workers deal with the incendiary stuff.*

> *Now see. Ten workers, including six women, were killed in an explosion at a fireworks unit in Sivakasi on May 9, 2024. This clearly confirm the fact that we generally do not learn from the past.*

These examples illustrate how engineers should study case examples instead of designing from data books alone. The engineering profession demands professionals to remain alert and be well informed at every stage of the project's history.

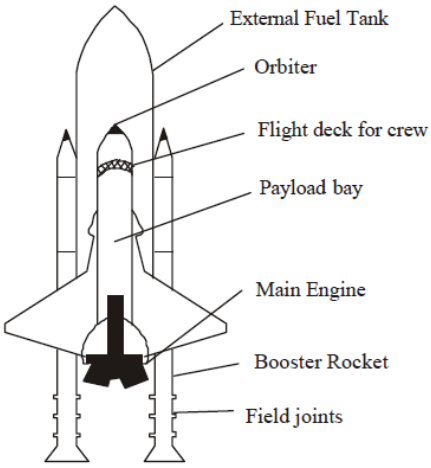
Example (Learning from the past)

The orbiter of the Challenger had three main engines fuelled by liquid hydrogen. The fuel was carried in an external fuel tank which was jettisoned when empty. During lift-off, the main engines fire for about nine minutes, although initially the thrust was provided by the two booster rockets. These booster rockets are of the solid fuel type, each burning a million pound load of aluminium, potassium chloride, and iron oxide.

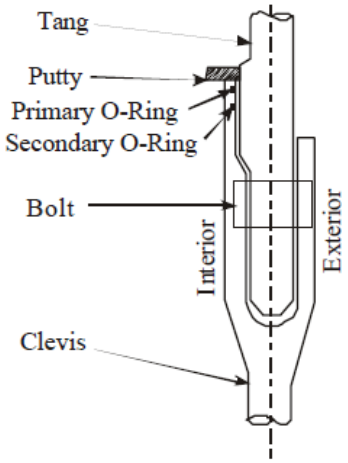
The casing of each booster rocket is about 150 feet long and 12 feet in diameter. This consists of cylindrical segments that are assembled at the launch site. There are four-field joints and they use seals consisting of pairs of O-rings made of vulcanized rubber. The O-rings work with a putty barrier made of zinc chromate.

The engineers were employed with Rockwell International (manufacturers for the orbiter and main rocket), Morton-Thiokol (maker of booster rockets), and they worked for NASA. After many postponements, the launch of Challenger was set for morning of Jan 28, 1986. Allan J. McDonald was an engineer from Morton-Thiokol and the director of the Solid Rocket Booster Project. He was sceptic about the freezing temperature conditions forecast for that morning, which was lower than the previous launch conditions. A teleconference between NASA engineers and MT engineers was arranged by Allan.

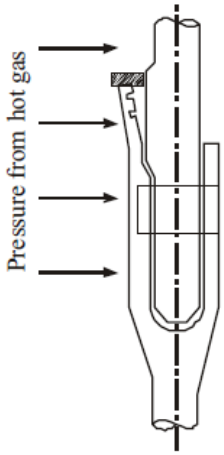
Arnold Thompson and Roger Boisjoly, the seal experts at MT explained to the other engineers how the booster rocket walls would bulge upon launch and combustion gases can blow past the O-rings of the field joints.



Challenger



Field joint before ignition



Field joint after ignition

On many of the previous flights the rings have been found to have charred and eroded. In freezing temperature, the rings and the putty packing are less pliable. From the past data gathered, at temperature less than 65 °F the O-rings failure was certain. But these data were not deliberated at that conference as the launch time was fast approaching.

The engineering managers Bob Lund and Joe Kilminster agreed that there was a safety problem. Boisjoly testified and recommended that no launch should be attempted with temperature less than 53 °F. These managers were annoyed to postpone the launch yet again. The top management of MT was planning for the renewal of contract with NASA, for making booster rocket. The managers told Bob Lund "to take-off the engineering hat and put on your management hat". The judgment of the engineers was not given weightage. The inability of these engineers to substantiate that the launch would be unsafe was taken by NASA as an approval by Rockwell to launch.

At 11.38 a.m. the rockets along with Challenger rose up the sky. The cameras recorded smoke coming out of one of the filed joints on the right booster rocket. Soon there was a flame that hit the external fuel tank. At 76 seconds into the flight, the Challenger at a height of 10 miles was totally engulfed in a fireball. The crew cabin fell into the ocean killing all the seven aboard.

Some of the factual issues, conceptual issues and moral/normative issues in the space shuttle challenger incident, are highlighted hereunder for further study.

CODES OF ETHICS

The 'codes of ethics' exhibit, rights, duties, and obligations of the members of a profession and a professional society.

The **Oxford Dictionary** gives the following two definitions for codes

- A set of moral principles accepted by the society or a group of people

- A set of rules arranged in a system

Almost every professional association has developed its own code of conduct displayed and publicized widely among its members.

Codes cover the standards that every rational person wants every other person to follow like

- Honesty and truth
- Honour, showing respect for integrity and reputation for achievement
- Knowledge, gained through education and experience
- Efficiency in performance with minimum effort
- Diligence and personal effort
- Loyalty to employer's goals
- Confidentiality and dependability in safeguarding information
- Protecting public safety and health

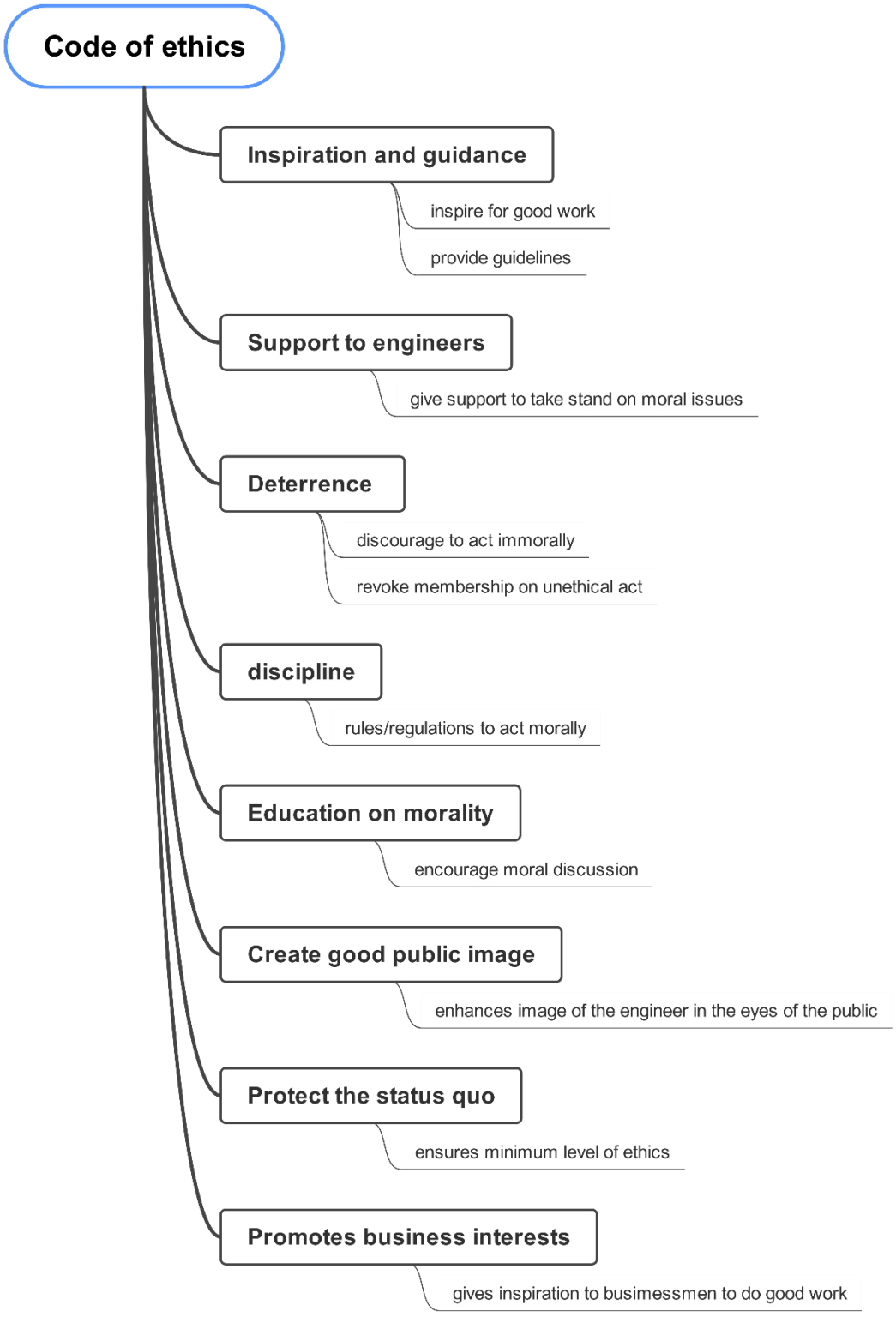
The codes exhibit the following essential roles:

- **Inspiration and guidance.** The codes express the collective commitment of the profession to ethical conduct and public good and thus inspire the individuals. They identify primary responsibilities and provide statements and guidelines on interpretations for the professionals and the professional societies.
- **Support to engineers.** The codes give positive support to professionals for taking stands on moral issues. Further they serve as potential legal support to discharge professional obligations.
- **Deterrence (discourage to act immorally) and discipline (regulate to act morally).** The codes serve as the basis for investigating unethical actions. The professional societies sometimes revoke membership or suspend/expel the members, when proved to have acted unethical. This sanction along with loss of respect from the colleagues and the society are bound to act as deterrent.
- **Education and mutual understanding.** Codes are used to prompt discussion and reflection on moral issues. They develop a shared understanding by the professionals, public, and the government on the moral responsibilities of the engineers. The Board of Review of the professional societies encourages moral discussion for educational purposes.
- **Create good public image.** The codes present positive image of the committed profession to the public, help the engineers to serve the public effectively. They

promote more of self regulation and lessen the government regulations. This is bound to raise the reputation of the profession and the organization, in establishing the trust of the public.

- **Protect the status quo.** They create minimum level of ethical conduct and promotes agreement within the profession. Primary obligation namely the safety, health, and welfare of the public, declared by the codes serves and protects the public.
- **Promotes business interests.** The codes offer inspiration to the entrepreneurs, establish shared standards, healthy competition, and maximize profit to investors, employees, and consumers.

It can be shown in following mind map for easy learning.


Code of ethics
Inspiration and guidance
inspire for good work
provide guidelines
Support to engineers
give support to take stand on moral issues
Deterrence
discourage to act immorally
revoke membership on unethical act
discipline
rules/regulations to act morally
Education on morality
encourage moral discussion
Create good public image
enhances image of the engineer in the eyes of the public
Protect the status quo
ensures minimum level of ethics
Promotes business interests
gives inspiration to busimessmen to do good work

Limitations of Code of Ethics

The codes are not remedy for all evils. They have many limitations, namely:

- **General and vague wordings.** Many statements are general in nature and hence unable to solve all problems.
- **Not applicable to all situations.** Codes are not sacred, and need not be accepted without criticism. Tolerance for criticisms of the codes themselves should be allowed.
- **Often have internal conflicts.** Many times, the priorities are clearly spelt out, e.g., codes forbid public remarks critical of colleagues (engineers), but they actually discovered a major bribery, which might have caused a huge loss to the exchequer.
- **They can not be treated as final moral authority for professional conduct.** Codes have flaws by commission and omission. There are still some grey areas undefined by codes. They can not be equated to laws. After all, even laws have loopholes and they invoke creativity in the legal practitioners.
- **Unawareness**. Even as members of the professional society, many are unaware of the codes
- **Different societies have different codes.** The codes can not be uniform or same! Unifying the codes may not necessarily solve the problems prevailing various professions, but attempts are still made towards this unified codes.
- **Codes are said to be coercive (forced).** They are sometimes claimed to be threatening and forceful.

ENVIRONMENTAL ETHICS

Environmental ethics is the study of (a) moral issues concerning the environment, and (b) moral perspectives, beliefs, or attitudes concerning those issues.

Engineers in the past are known for their negligence of environment, in their activities. It has become important now that engineers design eco-friendly tools, machines, sustainable products, processes, and projects.

These are essential now to

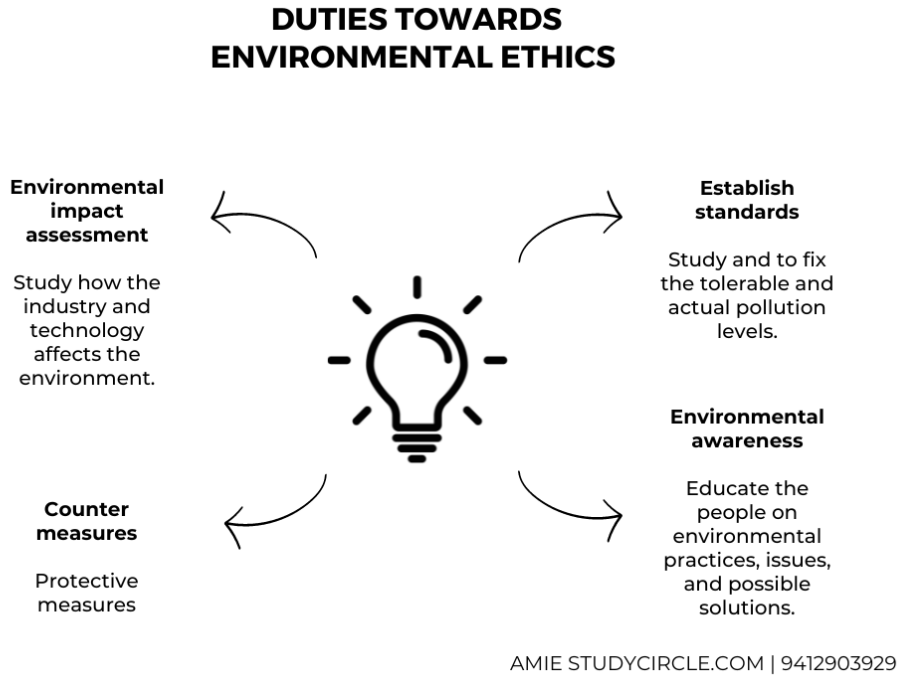
- ensure protection (safety) of environment
- prevent the degradation of environment, and
- slow down the exploitation of the natural resources, so that the future generation can survive.

Compaq Computer Corporation (now merged with HP) was the leader, who exhibited their commitment to environmental health, through implementation of the concept of 'Design for environment' on their products, unified standards all over the world units, and giving priority to vendors with a record of environmental concern.

Engineers as experimenters have certain duties towards environmental ethics, namely:

- **Environmental impact assessment:** One major but sure and unintended effect of technology is wastage and the resulting pollution of land, water, air and even space. Study how the industry and technology affects the environment.
- **Establish standards:** Study and to fix the tolerable and actual pollution levels.
- **Counter measures:** Study what the protective or eliminating measures are available for immediate implementation
- **Environmental awareness:** Study on how to educate the people on environmental practices, issues, and possible remedies.

Following mind map shows these points.



Example (Pollution from plastics)

In our country, several crores of plastic bottles are used as containers for water and oil, and plastic bags are used to pack different materials ranging from vegetables to gold ornaments. Hardly any of these are recycled. They end up in gutters, roadsides, and agricultural fields. In

all these destinations, they created havoc. The worse still is the burning of plastic materials in streets and camphor along with plastic cover in temples, since they release toxic fumes and threaten seriously the air quality. Cities and local administration have to act on this, collect and arrange for recycling through industries.

Example (e-waste disposal)

The parts of computers and electronic devices which have served its useful life present a major environmental issue for all the developing countries including India. This scrap contains highly toxic elements such as lead, cadmium, and mercury.

Even the radioactive waste will lose 89% of its toxicity after 200 years, by which time it will be no more toxic than some natural minerals in the ground. It will lose 99% of its remaining toxicity over the next 30,000 years. The toxic chemical agents such as mercury, arsenic, and cadmium retain toxicity undiminished for ever.

But these scraps are illegally imported by unscrupulous agencies to salvage some commercially valuable inputs. Instead of spending and managing on the scrap, unethical organizations sell them to countries such as India.

Strong regulation including (a) pressure on industries to set up disassembling facilities, (b) ban on disposal in landfill sites, (c) legislation for recycling requirements for these junk and (d) policy incentives for eco-friendly design are essential for our country.

Example (Depletion of Ozone Layer)

The ozone layer protects the entire planet from the ill-effects of ultraviolet radiation and is vital for all living organisms in this world. But it is eaten away by the Chloro-fluro-carbons (CFC) such as Freon emanating from the refrigerators, air conditioners, and aerosol can spray. This has caused also skin cancer to sun-bathers in the Western countries. Further NO and NO2 gases were also found to react with the ozone. Apart from engineers, the organizations, laws of the country and local administration and market mechanisms are required to take up concerted efforts to protect the environment.

COMPUTER ETHICS

Since it is the engineer who mostly plays the role of designer, manufacturer, manager and user of computers, the subject computer ethics has become an essential branch of engineering ethics. There have been several definitions of the term computer ethics.

- *It is the field which studies the way in which computers pose new versions of standards and more dilemmas, exaggerating the problems and forcing us to apply ordinary moral norms in uncharted realms. Computers give a new twist to the old ethical issues that are already well known—Deborah Johnson in her book Computer Ethics.*

- *Computer ethics should be viewed as a branch of professional ethics, which is concerned with standards and practices of codes of conduct of computing professionals. Computing professionals are those involved in the design and development of computer articles. The ethical decisions made during the development of these artefacts have a direct relationship to many of these issues discussed under the broader concept of computer ethics— Donald Gotterbarn*

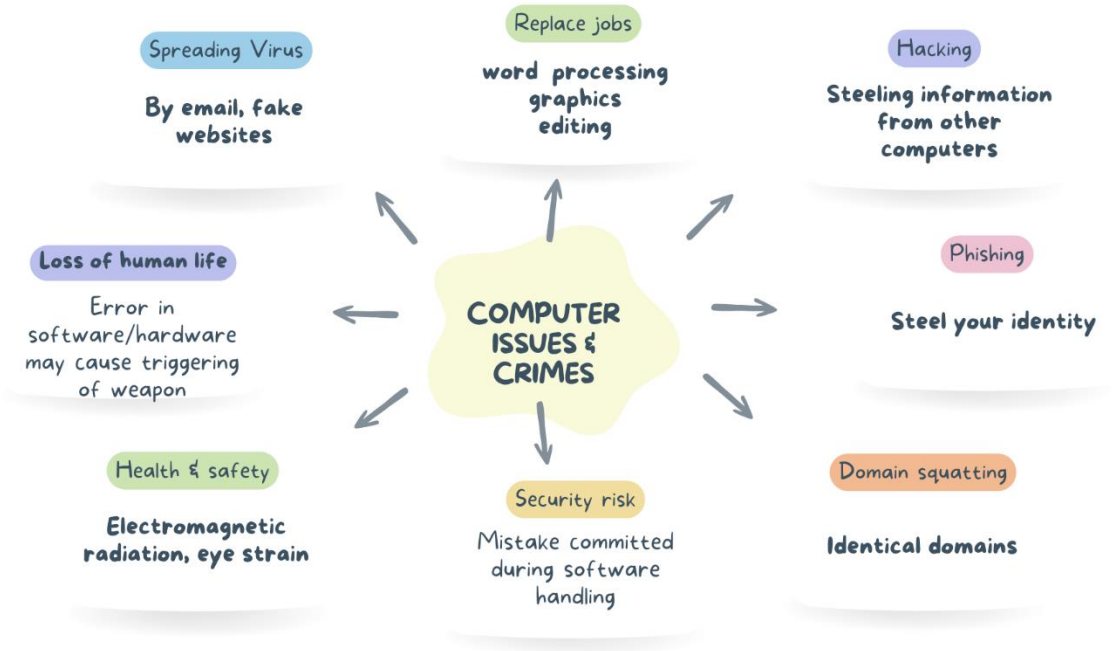
Computer crimes and issues

- **The usage of computer replaces the job positions.** This has been overcome to a large extent by readjusting work assignments, and training everyone on computer applications such as word processing, editing, and graphics.
- **Hacking:** The software is stolen or information is accessed from other computers. This may cause financial loss to the business or violation of privacy rights of the individuals or business. In case of defence information being hacked, this may endanger the security of the nation.
- **Spreading virus:** Through mail or otherwise, other computers are accessed and the files are erased or contents changed altogether. 'Trojan horses' are implanted to distort the messages and files beyond recovery. This again causes financial loss or mental torture to the individuals. Some hackers feel that they have justified their right of free information or they do it for fun. However, these acts are certainly unethical.
- **Phishing:** It is a type of deception designed to steal your identity. It is like catching a large fish by offering a small fish as bait. The criminal sends you a message under a pretence such as your banker asking you to update your password, etc. They seem to come form popular websites that you trust or have financial or other confidential dealings with, and appear official enough asking you to update the ID number, passwords, account information, and other personal data.
- **Loss of human lives:** Risk and loss of human lives lost by computer, in the operational control of military weapons. There is a dangerous instability in automated defence system. An unexpected error in the software or hardware or a conflict during interfacing between the two, may trigger a serious attack and cause irreparable human loss before the error is traced. The Chinese embassy was bombed by U.S. military in Iraq a few years back, but enquiries revealed that the building was shown in a previous map as the building where insurgents stayed.
- **Health and safety:** The ill-effects due to electromagnetic radiation, especially on women and pregnant employees, mental stress, wrist problem known as Carpel Tunnel

Syndrome, and back pain due to poor ergonomic seating designs, and eye strain due to poor lighting and flickers in the display and long exposure, have been reported worldwide. Over a period of long exposure, these are expected to affect the health and safety of the people. The computer designers should take care of these aspects and management should monitor the health and safety of the computer personnel.

- **Domain squatting :** Domain name (also called trademark or brand or logo or identity) in any field of activity is a registered identification symbol or brand name over which a particular individual or company has the exclusive and sole rights. Domain squatting is the act of registering domain names and trademarks that are identical or confusingly similar to popular brand names and use it in Internet search engine, by bombarding with a host of websites having IP addresses identical or similar to the original brand names, thereby misleading public who go more by brand name or logo in choosing products and services. Domain squatting has in recent times become a big nuisance to many large companies that thrive on the popularity of their brand name or logo in their business prospects. In view of lakhs of websites being available for each activity, it is a Herculean task for the original domain-name holder to be vigilant over search engines and discover any such domain squatting. This crime first surfaced in 1998, when the cases were referred to WIPO Arbitration and Mediation Centre.

Following mind map gives above information in a nutshell.



WHISTLE BLOWING

Whistle blowing occurs when an employee or former employee conveys information about a significant moral problem outside approved organizational channels (or against strong pressure) to someone who is in a position to take action on the problem.



Whistleblowing is the exposure of fraud and abuse by an employee

– (The Columbia Encyclopaedia—2001)

In this context, young engineering graduates should take this oath:

'I will speak out against evil and unjust practices whenever and wherever I encounter it.'

Whistle blowing should be attempted when

- When you have the need,
- When you have full knowledge of the situation,
- When you are in the proximity,
- When you have the capability to attract attention,
- When you have the clear definition of targets, and
- When you think it is a last resort

There are **four aspects of whistle blowing**, namely:

- **Basis of disclosure:** The basis for disclosure may be intentional, or under pressure from superiors or others not to disclose.
- **Relevance of topic:** The whistle blower believes that the information is about a significant problem for the organization or its business ally. It can be a threat to the

public or employees' health, safety and welfare or a criminal activity, or unethical policies or practices, or an injustice to the workers within the organization.

- **Agent:** The person disclosing the information may be a current or former employee or a person having a close link to the organization.
- **Recipient:** The person or organization, who receives the information, is in a position to remedy the problem or alert the affected parties. Usually, the recipients are not aware of the information fully or even partially.

Types

Based on the destination (recipient), whistle blowing is classified into types, as:

- **Internal**: In this case, the information is conveyed to a person within the organization, but beyond the approved channels.
- **External**: This happens when the information is transmitted outside the organization. The recipient may be a municipal chairman or member of legislature or minister. It becomes severe if the information reaches the press and through them the public. The damage is maximum and sometimes poses difficulty in remedying the situation.

Based on the origin or source (agent), this can be divided into three types, as follows:

- **Open**: The originator reveals his identity as he conveys the information. This information is reliable and true, but sometimes partially true.
- **Anonymous**: The identity is concealed. The information may or may not be true. But the agent anticipates perhaps some repression or threat, if identity is revealed.
- **Partly anonymous (or partly open):** Such a situation exists when the individual reveals his identity to the journalist, but insists that the name be withheld from others.

Elements of whistle blowing

- **Disclosure** The act of blowing the whistle
- **Topic** A significant moral problem for the organisation like criminal behaviour, unethical policies or practices, injustices to workers within the organisation, serious threats to public safety and well-being
- **Agent** Internal or external whistle blower
- **Recipient** A person or organisation in a position to act on the problem
- **Investigation** The process of consulting with associates or other colleagues to discuss and investigate into the allegation

- **Action** The Action taken if the above found to be correct and serious

COLLECTIVE BARGAINING

Collective bargaining is a process whereby organized labour and management negotiate the terms and the conditions of employment. Collective bargaining is a process of negotiations between employers and the representatives of a unit of employees aimed at reaching agreements that regulate working conditions. Collective agreement usually set out wage scales, working hours, training, health and safety, overtime, grievances, mechanisms and rights to participate in workplace or company affairs.

Collective bargaining is specifically an industrial relations mechanism or tool, and is an aspect of negotiation, applicable to employment relationship. In collective bargaining the union always has a collective interest since the negotiations are for the benefit of several employees.

We can say that Collective bargaining is a method by which trade unions protect and improve the condition of their member's working lives.

In majority of the cases collective bargaining process deals with issues like Rate of wages, pay, Hours of employment, working conditions, Employment policies and Productivity settlement.

Objectives of collective bargaining

There are some basic objectives of collective bargaining on that basis whole process generally work, these are:

- Settle the conflicts related to working conditions and wages.
- To protect the interest of the workers through collective action.
- To resolve the difference between the workers and management through voluntary negotiations and to arrive at a consensus.
- To avoid third party intervention in matters relating to employment.

Advantages of collective bargaining

- **Higher wages and better help for union members.** Unions can negotiate collectively for gains unique workers could not reach alone. For example, unionized workers typically earn 10-30% higher wages than their non-union peers.
- **Fairer work rules and policies.** Collective deals help establish workplace order, justice, and due process. Clear grudge policies and discipline policies benefit both workers and regime.

- **Improved job joy, productivity, and loyalty.** Union fellows report higher job joy due to better pay, benefits, and protections. This leads to lower turnover, less truancy, and higher productivity.
- **More social justice through the fairer distribution of economic gains.** Collective bargaining helps narrow wage gaps between executives and non-executive workers. For example, CEO-to-median worker pay ratios are typically lower at unionized firms.
- **Safer working needs.** Union contracts often include extensive health and safety conditions that enhance workplace safety. Union workers have lower occupational injury and fatality rates.
- **Greater worker voice and input.** Unions provide an organized channel for workers to provide input on workplace issues that affect them. This charge enhances decision-making and creation.
- **More stable job and income.** Collective bargaining typically includes conditions like seniority rights, just cause, and severance, feeding job security for union fellows during financial downturns.
- **Spill over benefits for non-union workers.** Union contracts set standards that non-union employers must match to remain competitive. This "union premium" spills to non-union workers through higher pay and better benefits.
- **Higher labour force participation.** Research shows collective bargaining rights increase women's and older workers' labour force participation by feeding benefits like paid leave, flex time, and retiree healthcare.
- **More economic equality.** Collective bargaining helps redistribute income from capital to labour, easing economic inequality. Countries with stronger union rights tend to have less income disparity.
- **Early resolution of disputes.** Grudge courses in union contracts provide an set process for fixing conflicts early to avoid costly arbitration or litigation.
- **Greater adaptability and creation.** When joint, unions can work with management to identify gain options that benefit both workers and the firm.

ETHICS IN MNCS

To know what are the moral responsibilities and obligations of the multinational corporations operating in the host countries, let us discuss with the framework of rights ethics. Common minimal rights are to be followed to smoothen the transactions when the engineers and employers of MNCs have to interact at official, social, economic and sometimes political levels. At international level, the organizations are expected to adopt the minimum levels of

- values, such as mutual support, loyalty, and reciprocity,
- the negative duty of refraining from harmful actions such as violence and fraud, and
- basic fairness and practical justice in case of conflicts.

The ten international rights to be taken care of, in this context are:

- Right of freedom of physical movement of people
- Right of ownership of properties
- Freedom from torture
- Right to fair trial on the products
- Freedom from discrimination on the basis of race or sex. If such discrimination against women or minorities is prevalent in the host country, the MNC will be compelled to accept. MNCs may opt to quit that country if the human rights violations are severe.
- Physical security. Use of safety gadgets have to be supplied to the workers even if the laws of the host country do not suggest such measures.
- Freedom of speech and forming association
- Right to have a minimum education
- Right to political participation
- Right to live and exist (i.e., coexistence). The individual liberty and sanctity of the human life are to be respected by all societies.

TECHNOLOGY TRANSFER

It is a process of moving technology to a new setting and implementing it there. Technology includes hardware (machines and installations) and the techniques (technical, organizational, and managerial skills and procedures). It may mean moving the technology applications from laboratory to the field/factory or from one country to another. This transfer is effected by governments, organizations, universities, and MNCs.

Appropriate Technology

Identification, transfer, and implementation of most suitable technology for a set of new situations, is called **appropriate technology**. Technology includes both hardware (machines and installations) and software (technical, organizational and managerial skills and procedures). Factors such as economic, social, and engineering constraints are the causes for the modification of technology. Depending on the availability of resources, physical conditions (such as temperature, humidity, salinity, geographical location, isolated land area, and availability of water), capital opportunity costs, and the human value system (social

acceptability) which includes their traditions, beliefs, and religion, the appropriateness is to be determined.

For example, small farmers in our country prefer to own and use the power tillers, rather than the high-powered tractors or sophisticated harvesting machines. On the other hand, the latest technological device, the cell phones and wireless local loop phones have found their way into remote villages and hamlets, than the landline telephone connections. Large aqua-culture farms should not make the existing fishermen jobless in their own village.

MNCs and Morality

The economic and environmental conditions of the home and host countries may vary. But the multinational institutions have to adopt appropriate measures not to disturb or dislocate the social and living conditions and cultures of the home countries. A few principles are enlisted here:

- MNC should respect the basic human rights of the people of the host countries.
- The activities of the MNC should give economic and transfer technical benefits, and implement welfare measures of the workers of the host countries.
- The business practices of the multinational organisations should improve and promote morally justified institutions in the host countries.
- The multinationals must respect the laws and political set up, besides cultures and promote the cultures of the host countries.
- The multinational organisations should provide a fair remuneration to the employees of the host countries. If the remuneration is high as that of home country, this may create tensions and if it is too low it will lead to exploitation.
- Multinational institutions should provide necessary safety for the workers when they are engaged in hazardous activities and ‘informed consent’ should be obtained from them. Adequate compensation should be paid to them for the additional risks undertaken.

THE HOLISTIC CRITERIA FOR EVALUATION

The modern technologies and systems are optimized to the objective functions best suited to this world view. In order to facilitate the development of holistic technologies and systems, it will be necessary to visualize alternative objective functions and to formulate appropriate criteria for evaluation compatible with comprehensive human goal.

Generally speaking, there are three broad criteria to guide the development of such technologies and systems, viz.,

- Catering to appropriate needs and lifestyles,

- People-friendly, and
- Eco-friendly.

Criteria for Technologies

The above mentioned general criteria can be itemized into more specific form as follows:

- Catering to real human needs
- Compatible with natural systems and cycles
- Facilitating effective utilization of human body, animals, plants and materials
- Safe, user-friendly and conducive to health
- Producible with local resources and expertise as far as possible
- Promoting the use of renewable energy resources
- Low cost and energy efficient
- Enhancing human interaction and cooperation
- Promoting decentralisation
- Durability and life cycle recyclability of products

For Production Systems

The specific criteria to judge the appropriateness of the production systems may include the following:

- Optimal utilization of local resources and expertise
- Economic viability and sustainability
- Priority for local consumption
- Matching the pattern of production with the availability/productibility in the local environment and the pattern of consumption
- Decentralized systems capable of meaningful employment of people in the community
- Facilitating production by masses and not mass production in a centralized mode
- Promoting individual creativity and sense of accomplishment
- Using people-friendly and eco-friendly technologies
- Ensuring requisite quality of production
- Safe and conducive to the health of persons involved in production as well as others

For Management Models

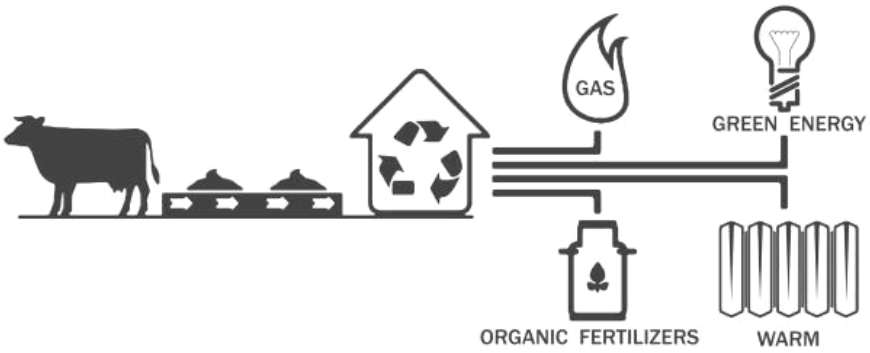
The management needs to focus at the fulfilment of the people involved in the production system as well the users of the produce and not to profit-mania. The following criteria can be chosen for a humanistic management model:

- The whole unit working as a well-knit family
- Cooperative and motivational
- Ensuring correct appraisal of human labour
- Targeting employer-employee as well as consumer satisfaction and not profit
- maximisation
- Sharing of responsibility and participative mode of management
- Continuous value addition of the persons involved
- Effectively integrating individual competencies and complementarity

HOLISTIC TECHNOLOGIES AND SYSTEMS

It will be a very educative exercise for us to visualize broadly how a typical community, say, of one thousand people will live in a holistic way in harmony with each other and the rest of nature, being largely self-sufficient in fulfilment of its needs and setting up systems which are conducive to comprehensive human goal. It may be easily appreciated that such a planning in detail is a project worthy of serious research and experimentation to evolve a viable alternative model.

We may carry out a techno-economic feasibility study and the design a holistic model keeping the comprehensive human goal as our objective function. Since it will be necessary in this model to rely on the local resources as far as possible, such a model will also need attention to augment these resources as well which includes promotion of bio-diversity, cattle, water harvesting, effective utilization of biomass, solar, wind and hydel energy sources etc. This would also involve careful planning of the agriculture, artisanal and agro-industrial activity. The matching of resources and needs will also need to be accomplished This visualization will enable us to identify, select or develop appropriate technologies, production systems and the methods to organize these activities in a harmonious way.



In the face of the environmental and other problems aggravating because of the widespread use of fossil fuels and other non-renewable resources, there is an increasing interest throughout the world to evolve alternative renewable technologies and modes of production. However, this is only possible in the light of right understanding, with adoption of appropriate life-styles and with proper assessment of needs.

Example (Holistic technologies)

- Systems for generation and utilization of Biogas obtainable from anaerobic digestion of all kinds of moist biomass such as animal and human excreta, kitchen waste, moist agro-waste, sewage effluents etc.
- Systems for decentralized production of Biodiesel obtainable from esterification of various vegetable oils.
- Gadgets and Implements to facilitate efficient utilization of Human muscle power and Animal draught power such as human operated agricultural tools and domestic appliances.
- Devices for efficient utilization of Solar energy such as solar water heaters, solar cookers, solar driers etc.
- Systems for water conservation and water shed management for efficient utilization of rain water and for eco-restoration.
- Technologies and architecture promoting green building materials and energy conservation such as construction with compressed/stabilized mud-blocks and terracotta tiles.

Example (Bhopal Gas Tragedy)

The Union Carbide had 51% and the Indian subsidiary UC India Ltd. had 49% of stock. In 1983, there were 14 plants in India manufacturing chemicals, pesticides, and other hazardous

products. The Bhopal plant had a license to make Methyl isocyanate-based pesticides. In November 1984, they had decided to close down the plant. For quite some years before the production rate was going down.



The cumulative effects of the following factors caused the tragedy in Bhopal on December 3, 1984.

- Maintenance was neglected and the trained maintenance personnel were reduced as economy measure. Need for quick diagnosis aggravates the situation by causing considerable psychological stress on the plant personnel.
- Training activities for the supervisory personnel were stopped. This led to inadequate training of the personnel to handle emergencies.
- Periodical Safety Inspection teams from U.S. which visited previously were also stopped. From the initial U.S. Standards, the safety procedures were reduced to low level Indian standards. The procedures had been deteriorating at these sites for weeks or months, prior to the accident. There was clear lack of management systems and procedures to ensure safety.
- Vital spares for equipments and machineries were not available
- Absence of capital replacement led to the stagnant economy of the plant.
- The high turnover of the experienced engineers and technicians, who were demoralized by the lack of development.
- Lack of experienced personnel to operate and control the vital installations.
- They have not conducted a thorough process hazards analysis that would have exposed the serious hazards which resulted in disaster later.
- No emergency plan was put in practice, during the shut down and maintenance.

- Above all, the commitment of top-level management to safety was lacking. They have been paying only lip service to safety of people of the host country.

Technologically, the tragedy was caused by a series of events listed:

- The safety manual of Union Carbide prescribed that the MIC tanks were to be filled only up to 60% of the capacity. But the tanks were reported to have been filled up to 75%.
- The safety policy prescribed that an empty tank should be available as a stand-bye in case of emergency. But the emergency tank was also filled with to its full capacity. These facts confirmed that the MNC had not followed and implemented appropriate safety standards of the home country in the host country. Can this be called as an example of 'misappropriate technology'?
- The storage tanks should be refrigerated to make the chemical less reactive. But here the refrigeration system was shut down as an economy measure. This raised the temperature of the gas stored.
- The plant was shut down for maintenance two months earlier. The worker who cleaned the pipes and filters connected to the tanks and closed the valves, was not trained properly. He did not insert the safety disks to prevent any possible leakage of the gas. This led to the build up of temperature and pressure in the storage tanks.
- When the gas started leaking out, the operators tried to use the vent gas-scrubber that was designed to reduce the exhausting gas. But that scrubber was also shut down.
- There was a flare tower that was designed to burn-off the gas escaping from the scrubber. That was not also in working condition.
- The workers finally tried to spray water up to 100 feet to quench the gas (which is water soluble). But the gas was escaping from the chimney of 120-feet high.
- The workers were not trained on safety drills or emergency drills or any evacuation plans.

The gas escaped into the air and spread over 40 sq. km. About 600 people died and left 7000 injured and the health of about 2 million people was affected adversely. Even after 22 years, influence of the Central Government and the courts, the compensation had not reached all the affected people.

Question (GTU 2022, 4 marks)

Differentiate between Ethics and Philosophy.

Answer

Ethics

- Moral principles a person can follow
- Comprise of moral guidelines and advice a human can follow in his lifestyle
- There is no specific origin; has a strong relation to religions and morality in human society
- Cannot be separated according to period, country, and subject matter since they are universally considered moral principles

Philosophy

- Study of the fundamental nature of knowledge, reality, and existence, as an academic discipline
- Contains theories and ideologies postulated by philosophers concerning a specific subject matter in life
- There are specific founders or several pioneering figures known as philosophers
- Has varied branches according to period, school, movement, country, subject matter, etc.

Example (GTU 2021, 4 marks)

Define Engineering Ethics. Distinguish between ethics, laws and morals.

Answer

- **Ethics** is the moral principles that govern a person's behaviour or the conducting of an activity. **Morals** are concerned with the principles of right and wrong behaviour and the goodness or badness of human character. **Law** is the system of rules that a particular country or community recognizes as regulating the actions of its members and may enforce by the imposition of penalties.
- If you are ethical you can abide by the law. If you are Moral you can be ethical. Also, if you are moral you can abide by the law. But you can never be all three together.
- Morality governs private, personal interactions. Ethics governs professional interactions. Law governs society as a whole, often dealing with interactions between total strangers.

Question (GTU 2021, 4 marks)

Briefly elaborate below statements in context to why they cannot be considered business ethics:

(i) Ethics is different from religion.

(ii) Ethical Standards are different from cultural traits.

Answer

Ethics are different from religion

Often, religion and ethics are treated as the same thing. Not all religions are the same, some are more liberal than others and some more conservative, but in general, all religious traditions believe that their faith represents a path to enlightenment and salvation.

By contrast, ethics are universal decision-making tools that may be used by a person of any religious persuasion, including atheists. While religion makes claims about cosmology, social behaviour, and the "proper" treatment of others, etc. Ethics are based on logic and reason rather than tradition or injunction.

Ethical Standards are different from cultural traits

Different cultures have different values and ethics because they have developed over time in response to a variety of factors, including historical, economic, social, and political influences. These factors can shape a culture's beliefs, customs, and norms, as well as its values and ethical standards.

Cultures can also differ in terms of what they consider to be important or valuable. For example, one culture may place high value on individual freedom and autonomy, while another may place a higher value on community and social harmony. Similarly, one culture may prioritize economic growth and wealth, while another may place a higher value on environmental protection and sustainability.

It is important to recognize and respect the cultural differences that exist between different societies. It is also important to be mindful of these differences when communicating and interacting with people from other cultures. At the same time, we need to recognize the inherent value and dignity of every person. We need to respect the rights and dignity of all individuals, regardless of cultural differences.

Question (BPUT 2020, 16 marks)

Explain the Global ethical issues threatening social development (min. four).

Answer

Global ethical issues can pose significant threats to social development by undermining progress, fairness, and the well-being of individuals and communities worldwide. Here are some key global ethical issues that contribute to these threats:

- **Climate Change:** The ethical dimension of climate change lies in its disproportionate impact on vulnerable populations and future generations. The issue of global warming caused by human activities, such as industrial pollution and deforestation, has far-reaching consequences for social and economic systems, access to resources, and human health.
- **Economic Inequality:** The growing gap between the rich and the poor is a major ethical concern. Economic inequality exacerbates social divisions, limits opportunities for disadvantaged groups, and undermines social cohesion. This issue encompasses various facets, including wealth concentration, income disparities, and unequal access to education, healthcare, and basic resources.
- **Human Rights Violations:** Widespread human rights abuses, such as discrimination, persecution, and oppression, threaten social development. Violations of civil, political, economic, social, and cultural rights hinder progress, undermine justice, and perpetuate social inequalities.
- **Corruption:** Corruption erodes trust in institutions, fosters inequality, and diverts resources away from essential services and development programs. It undermines the rule of law, exacerbates poverty, and impedes social progress by perpetuating a culture of dishonesty, unfairness, and lack of accountability.
- **Technological Impact:** Ethical dilemmas arise from rapid technological advancements, including artificial intelligence, automation, genetic engineering, and data privacy. These issues encompass concerns about the ethical use of emerging technologies, potential job displacement, privacy breaches, and the digital divide, which can exacerbate social inequalities.
- **Access to Healthcare:** Disparities in healthcare access and affordability are significant global ethical issues. Limited access to essential medical services, medicines, and vaccines disproportionately affects marginalized communities, leading to preventable suffering and loss of life.
- **Migration and Refugee Crisis:** The ethical challenges surrounding migration and refugees involve issues of human rights, social integration, and global solidarity. The forced displacement of people due to conflicts, persecution, or environmental factors calls for ethical responses that prioritize human dignity, protection, and fair treatment.
- **Bioethics:** Advances in biotechnology, such as gene editing and human cloning, raise complex ethical questions regarding human dignity, autonomy, and the potential for unintended consequences. Ethical considerations in biomedical research, organ transplantation, and end-of-life decisions also have global implications.

- **Cultural Diversity and Preservation:** Preserving cultural diversity and respecting indigenous rights are ethical imperatives for sustainable social development. The erosion of cultural heritage, indigenous knowledge, and traditions can lead to the marginalization of communities, loss of identity, and unequal power dynamics.

Addressing these global ethical issues requires collective action, ethical leadership, and the promotion of human rights, fairness, and sustainability. Governments, international organizations, civil society, and individuals all play critical roles in finding solutions and fostering a more just and inclusive global society.

Question (AU 2020, 16 marks)

Give note on "Employee Rights" and its role in a Business Organization.

Answer

Employee rights refer to the legal and moral entitlements that employees have in the workplace. These rights are designed to protect employees from unfair treatment, ensure their safety and well-being, and promote fair employment practices. Here are some key points about employee rights and their role in a business organization:

- **Legal Protection:** Employee rights are enshrined in labour laws and regulations that vary from country to country. These laws cover areas such as minimum wage, working hours, overtime compensation, workplace safety, non-discrimination, and protection against harassment and wrongful termination. Adhering to these laws is essential for businesses to avoid legal consequences and maintain a positive work environment.
- **Fair Treatment:** Employee rights promote fair treatment and equal opportunities for all employees. This includes the right to be free from discrimination based on race, gender, age, religion, disability, or other protected characteristics. Fair treatment also encompasses the right to a workplace free from harassment, bullying, or retaliation.
- **Compensation and Benefits:** Employees have the right to fair compensation for their work, including receiving at least the minimum wage as stipulated by law. They may also be entitled to benefits such as healthcare, retirement plans, paid leave, and other perks provided by the organization. Ensuring fair compensation and benefits is crucial for attracting and retaining talented employees.
- **Health and Safety:** Employers have a responsibility to provide a safe and healthy work environment. This includes implementing safety protocols, providing necessary safety equipment, and addressing hazards that may pose risks to employees' well-being.

Employees have the right to work in an environment that does not jeopardize their physical or mental health.

- **Privacy and Confidentiality:** Employee rights include privacy and confidentiality protections. Employees have the right to keep their personal information secure and to expect that their communications and activities will be respected and kept confidential unless required by law or legitimate business reasons.
- **Collective Bargaining and Unionization:** In many countries, employees have the right to engage in collective bargaining and form labour unions to negotiate with employers on matters such as wages, working conditions, and benefits. These rights enable employees to have a collective voice and participate in decisions that affect their work lives.

The role of employee rights in a business organization is significant for several reasons:

- **Employee Satisfaction and Engagement:** Respecting and upholding employee rights fosters a positive work environment where employees feel valued, respected, and motivated. This, in turn, leads to higher job satisfaction, increased productivity, and better employee retention.
- **Legal Compliance:** Adhering to employee rights laws and regulations is crucial for avoiding costly legal disputes, fines, and reputational damage to the organization. Compliance with labour laws demonstrates ethical business practices and helps build trust with employees and stakeholders.
- **Employer Branding:** Organizations that prioritize employee rights and create a supportive work environment enhance their reputation as responsible employers. This can attract top talent, improve the organization's brand image, and give it a competitive edge in the labour market.
- **Social Responsibility:** Respecting employee rights aligns with the broader concept of corporate social responsibility (CSR). It demonstrates an organization's commitment to ethical conduct, social justice, and the well-being of its employees, contributing to a more equitable and sustainable society.

Question (GTU 2021, 2023, 7 marks)

Neelam is working as senior HR manager at Zion IT company. Mention the code of personal ethics she needs to possess as an employee of the organization.

Answer

As a senior HR manager at Zion IT company, Neelam should adhere to a code of personal ethics that reflects her professional responsibilities and ensures ethical conduct in her role. Here are some key elements that Neelam should consider in her personal code of ethics:

- **Confidentiality**: Neelam should respect and maintain the confidentiality of sensitive employee information, such as personal data, performance evaluations, and disciplinary records. She should handle this information with care and only share it on a need-to-know basis for legitimate business purposes.
- **Integrity and Honesty:** Neelam should demonstrate integrity and honesty in all her interactions and decisions. She should be truthful and transparent in her communication with employees, colleagues, and management, ensuring that she acts with integrity and avoids conflicts of interest.
- **Fairness and Impartiality:** Neelam should treat all employees fairly and impartially, regardless of their personal characteristics, background, or relationships. She should ensure that recruitment, promotion, and disciplinary processes are based on merit, equal opportunity, and objective criteria.
- **Respect and Dignity:** Neelam should treat all individuals with respect and dignity, fostering a work environment free from discrimination, harassment, or bullying. She should promote inclusivity, diversity, and sensitivity to cultural differences, ensuring that employees feel valued and respected.
- **Compliance with Laws and Regulations:** Neelam should comply with all applicable labour laws, regulations, and company policies. She should stay updated on legal requirements related to employment practices, privacy, and anti-discrimination, and ensure that the organization meets its obligations in these areas.
- **Conflict Resolution:** Neelam should strive to resolve conflicts and disputes in a fair and constructive manner. She should encourage open dialogue, listen to different perspectives, and facilitate mediation or alternative dispute resolution processes to promote a positive work environment.
- **Professional Development and Continuous Learning:** Neelam should commit to ongoing professional development to enhance her HR knowledge and skills. She should stay informed about best practices, industry trends, and ethical standards in HR management, ensuring that she can effectively support the organization and its employees.
- **Ethical Use of Power and Influence:** As a senior HR manager, Neelam should use her position responsibly and ethically. She should avoid any abuse of power or authority,

ensuring that her decisions and actions are guided by fairness, transparency, and the best interests of the organization and its employees.

- **Social Responsibility:** Neelam should consider the social and environmental impact of HR policies and practices. She should promote sustainability, ethical sourcing, and corporate social responsibility initiatives that align with the values and goals of the organization.

Question (JNTUH 2020, 8 marks)

Explain two senses of loyalty.

Answer

Agency Loyalty

It is one's commitment to the contractual obligations to his employer. These duties are specified in the appointment order or the contract document, and the employer who is paying expects the engineer to follow these terms and regulations to the word. Agency loyalty is entirely a matter of actions irrespective of the motives. For example, if an action is committed contrary to the rules, it is viewed seriously, irrespective of the motive behind that act. In his day-to-day activities or in making decisions or in dealing with the public, the engineer considers himself as an agent or spokesman of his employer only. That is, he communicates the instructions of his employer rather than applying his own opinion or judgment or decision.

Identification Loyalty

By contrast, identification loyalty is more a matter of attitudes, emotions, and a sense of personal identity than the actions. This is motivated by the commitment and identification of one with the group to which he is loyal. Here, the engineer identifies himself and his knowledge in making decisions which may, to some extent, be differ from his employer's instructions.

It has a reciprocal relationship between the employees and employers, that is, employees would be loyal only if the employer shows some commitment or recognition to them.

Question (GTU 2022, 3 marks)

Explain Morality in short.

Answer

Morality is concerned with principles and practices of morals such as:

- What ought or ought not to be done in a given situation?
- What is right or wrong about the handling of a situation? and

- What is good or bad about the people, policies, and ideals involved?

Features of morality are

- More general and prescriptive based on customs and traditions.
- More concerned with the results of wrong action, when done.
- Thrust is on judgment and punishment, in the name of God or by laws.
- In case of conflict between the two, morality is given top priority, because the damage is more. It is more common and basic.
- Example: Character flaw, corruption, extortion, and crime.

Example (BPUT 2020, 16 marks)

Describe the Jean Piaget's theory of moral development by mentioning the thought process of two groups of children on different aspects.

Answer

To understand adult morality, Piaget believed that it was necessary to study both how morality manifests in the child's world as well as the factors that contribute to the emergence of central moral concepts such as welfare, justice, and rights. By interviewing children, Piaget (1965) found that young children were focused on authority mandates and that with age, children become autonomous, evaluating actions from a set of independent principles of morality.

He developed **two phases** of moral development, one common among children and the other common among adults.

Heteronomous Phase (5 and 10 years)

The first is the Heteronomous Phase. This phase, more common among children, is characterized by the idea that rules come from authority figures in one's life, such as parents, teachers, and God. It also involves the idea that rules are permanent no matter what. Thirdly, this phase of moral development includes the belief that "naughty" behaviour must always be punished and that the punishment will be proportional. This absolutism in moral development is seen in children's play from the age of 5, where they exhibit a blind belief in the rules and ideas of right and wrong passed to them by their elders.

Autonomous Phase (10 years and above)

The second phase in Piaget's theory of moral development is referred to as the Autonomous Phase. This phase is more common after one has matured and is no longer a child. In this phase, people begin to view the intentions behind actions as more important than their consequences. For instance, if a person who is driving swerves in order to not hit a dog and

then knocks over a road sign, adults are likely to be less angry at the person than if he or she had done it on purpose just for fun. Even though the outcome is the same, people are more forgiving because of the good intention of saving the dog. This phase also includes the idea that people have different morals and that morality is not necessarily universal. People in the Autonomous Phase also believe rules may be broken under certain circumstances. For instance, Rosa Parks broke the law by refusing to give up her seat on a bus, which was against the law but something many people consider moral nonetheless. In this phase, people also stop believing in the idea of immanent justice.

Piaget described that children below the age of 5 do not possess any kind of morality and called it **Pre Moral**.

Question (BPUT 2020, 6 marks)

Write a note on moral absolutism.

Answer

Moral absolutism declares that there are certain universal moral principles by which all peoples' actions may be judged. It is a form of deontology.

The challenge with moral absolutism, however, is that there will always be strong disagreements about which moral principles are correct and which are incorrect.

For example, most people around the world probably accept the idea that we should treat others as we wish to be treated ourselves. But beyond that, people from different countries likely hold varying views about everything from the morality of abortion and capital punishment to nepotism and bribery.

Moral absolutism contrasts with moral relativism, which denies that there are absolute moral values. It also differs from moral pluralism, which urges tolerance of others' moral principles without concluding that all views are equally valid.

So, while moral absolutism declares a universal set of moral values, in reality, moral principles vary greatly among nations, cultures, and religions.

Question (BPUT 2020, JNTUH 2018, 6 marks)

Write a note on roles and responsibilities of an Engineer.

Answer

Loyalty to corporations, respect for authority, collegiality and other teamwork are a few important virtues in the field of Engineering.

- **Loyalty**. Loyalty is the faithful adherence to an organization and the employer.

- **Collegiality** It is the term that describes a work environment where responsibility and authority are shared among the colleagues. The National Society of Professional Engineers (NSPE) Code, for example, states that "Engineers shall not attempt to injure, maliciously or falsely, directly or indirectly, the professional reputation, prospects, practice or employment of other engineers. Engineers who believe others are guilty of unethical or illegal practice shall present such information to the proper authority for action".
- **Respect for Authority** In order to meet the organizational goals, the professionals should possess respect for authority. According to the goals of the company, the hierarchical authority is distributed. A service oriented or engineer-oriented company concentrates on the quality of the products which are decided by the engineers as they are the subject matter experts. Whereas a company when it is customer-oriented company, focuses primarily on the satisfaction of the customers. Hence the goal of the company decides the power between a General Manager and a Technical Manager or an Engineer.
- **Collective Bargaining** At the time of conflicts or arguments, there will arise the need for negotiation between the parties. Conflicting situations which call for negotiation might occur on areas related to pay scales, working hours, training, health and safety, overtime, grievance mechanisms, rights in work places or company affairs, etc. The process of voluntary negotiations between the employers and a group of employees to resolve the conflicts is called Collective Bargaining.

Question (BPUT 2018, 4 marks)

Discuss the need to focus on professional ethics.

Answer

Good laws when enforced effectively produce benefits. They establish minimal standards of professional conduct and provide a motivation to people. Further they serve as moral support and defence for the people who are willing to act ethically.

The rules which govern engineering practice should be construed as of responsible experimentation rather than rules of a game. This makes the engineer responsible for the safe conduct of the experiment.

Precise rules and sanctions are suitable in case of ethical misconduct that involves the violation of established engineering procedures, which are aimed at the safety and the welfare of the public.

Question (JNTUK 2023, 6 marks)

Need of commitment in engineering profession.

Answer

Commitment is essential in the engineering profession for several reasons:

- **Project Success:** Engineering projects often involve complex and challenging tasks that require significant effort and dedication. Without commitment, engineers may not devote sufficient time and resources to complete their work successfully.
- **Professionalism**: Commitment is a key attribute of professionalism. Engineers are entrusted with designing and implementing solutions that impact the safety, functionality, and well-being of individuals and society as a whole. A lack of commitment can lead to subpar work, compromising the integrity and reputation of the engineering profession.
- **Teamwork and Collaboration:** Engineering projects usually involve multidisciplinary teams, where effective collaboration is crucial. Commitment ensures that engineers fulfill their obligations to the team, contribute their expertise, and support their colleagues. It fosters a culture of trust, reliability, and accountability, leading to better teamwork and overall project outcomes.
- **Ethical Responsibility:** Engineers have a responsibility to prioritize the safety, health, and welfare of the public. Commitment to ethical standards and professional codes of conduct is vital to ensure that engineers uphold these responsibilities. It involves adhering to regulations, standards, and best practices, and acting in the best interest of society.
- **Continuous Learning and Adaptation:** Engineering is a dynamic field that constantly evolves with technological advancements and changing requirements. Commitment to ongoing learning and professional development is necessary to stay updated with the latest knowledge, tools, and techniques. It enables engineers to adapt to new challenges, improve their skills, and provide innovative solutions.
- **Project Deadlines and Budgets:** Engineering projects typically have strict deadlines and budget constraints. Commitment helps engineers manage their time effectively, prioritize tasks, and meet project milestones. It involves taking ownership of deliverables, being proactive in problem-solving, and maintaining a disciplined approach to project management.
- **Client Satisfaction:** Engineering projects often serve clients or stakeholders who have specific needs and expectations. Commitment to understanding and fulfilling these

requirements is vital for client satisfaction. Dedicated engineers strive to exceed expectations, deliver high-quality solutions, and provide excellent service, thereby building strong client relationships and fostering future opportunities.

Question (AU 2021, 2 marks)

Comment on the code, ''Engineers shall issue public statements in an objective and truthful manner".

Answer

- Engineers shall issue public statements only in an objective and truthful manner because technical expertise is not disinterested and is influenced by economic and political interests.
- Additionally, engineering professional societies have ethical codes that prioritize the safety, health, and welfare of the public, and engineers have a duty to report illegal or unsafe conditions.
- Public perception of the engineering profession can be influenced by misconceptions and negative comments, which can lead to detrimental policies.
- Understanding how opinions are formed and changed is crucial for engineers to effectively communicate their expertise and address public concerns.

Question (PTU 2019, 2023, 5 marks)

Explain Competence in Professional-Ethics.

Answer

Competence in professional ethics refers to the ethical responsibility of professionals to possess and maintain the necessary knowledge, skills, and expertise to perform their duties competently and effectively.

It is a fundamental aspect of professional conduct that ensures professionals are capable of meeting the expectations and requirements of their respective fields while upholding ethical principles.

Here are some key points that highlight the importance of competence in professional ethics:

- **Knowledge and Expertise:** Professionals have a duty to acquire and maintain the knowledge and skills necessary to perform their work competently. This includes

staying updated with the latest advancements, industry standards, and best practices in their field.

- **Quality and Safety:** Competence is crucial for ensuring the quality and safety of professional work. Professionals must possess the expertise to identify potential risks, assess the impact of their actions, and implement appropriate measures to mitigate any adverse effects.
- **Client Trust and Confidence:** Competence inspires trust and confidence in clients and stakeholders. When professionals demonstrate their expertise and ability to deliver results, it fosters a sense of reliability and credibility.
- **Ethical Decision Making:** Competence plays a significant role in ethical decision making. Professionals must possess the knowledge and analytical skills to identify ethical issues, evaluate potential consequences, and make informed choices that align with ethical principles and professional codes of conduct.
- **Continued Professional Development:** Competence is not a static attribute; it requires ongoing professional development.
- **Legal and Regulatory Compliance:** Competence is closely linked to legal and regulatory compliance. Many professions have specific requirements and standards that professionals must meet to practice legally.

Question (AU 2021, 8 marks):

Discuss the various models of professional roles.

Answer

Promotion of public good is the primary concern of the professional engineers. There are several role models to whom the engineers are attracted. These models provoke their thinking, attitudes and actions.

- **Saviour** The engineer as a saviour, save the society from poverty, illiteracy, wastage, inefficiency, ill health, human (labour) dignity and lead it to prosperity, through technological development and social planning. For example, R.L. Stevenson.
- **Guardian** He guards the interests of the poor and general public. As one who is conversant with technology development, is given the authority befitting his expertise to determine what is best suited to the society. For example, Lawrence of Arabia (an engineer).
- **Bureaucratic Servant** He serves the organization and the employers. The management of an enterprise fixes its goals and assigns the job of problem solving to the engineer,

who accepts the challenge and shapes them into concrete achievements. For example, Jamshedji Tata.

- **Social Servant** It is one who exhibits social responsibility. The engineer translates the interest and aspirations of the society into a reality, remembering that his true master is the society at large. For example, Sir M. Visvesvaraya.
- **Social Enabler and Catalyst** One who changes the society through technology. The engineer must assist the management and the society to understand their needs and make informed decisions on the desirable technological development and minimize the negative effects of technology on people and their living environment. Thus, he shines as a social enabler and a catalyst for further growth. For example, Sri Sundarlal Bahuguna.
- **Game Player** He is neither a servant nor master. An engineer is an assertive player, not a passive player who may carry out his master's voice. He plays a unique role successfully within the organization, enjoying the excitement of the profession and having the satisfaction of surging ahead in a competitive world. For example, Narayanamurthy, Infosys and Dr. Kasthurirangan, ISRO.

Question (BPUT 2018, 10 marks)

You are a chief engineer of a famous steel plant and in the time of recruitment you are pressurized by your closed subordinate to infuse their candidates. Put your views to handle this situation.

Answer

As a chief engineer of a famous steel plant, it is crucial to prioritize professionalism, integrity, and fairness when it comes to the recruitment process. It is not ethical to infuse candidates based on the pressure from a subordinate or any other external influence.

Here are a few steps you can take to handle this situation:

- **Establish a clear recruitment policy:** Ensure that your organization has a well-defined and transparent recruitment policy in place. This policy should outline the criteria for candidate selection, the hiring process, and the roles and responsibilities of those involved in the process.
- **Communicate expectations:** Clearly communicate to your subordinate and all other employees that the recruitment process will be conducted with impartiality and based on

merit. Emphasize that any attempts to influence the process will not be tolerated and may result in disciplinary action.

- **Encourage diversity and inclusion:** Emphasize the importance of diversity and inclusion in the workforce. Encourage your team to consider candidates from diverse backgrounds to promote a culture of equal opportunity and fairness.
- **Empower the recruitment team:** Provide training and resources to your recruitment team to ensure they have the skills and knowledge required to identify and select the most suitable candidates. Encourage them to follow the established recruitment policy and make decisions based on merit.
- **Maintain transparency:** Keep the recruitment process transparent by sharing information about the selection criteria, interview process, and decision-making process with all involved parties. This will help build trust and discourage any attempts to exert undue influence.
- **Address concerns privately:** If your subordinate continues to pressure you to infuse their candidates, address the issue privately. Have an open and honest discussion to understand their concerns and explain the importance of maintaining a fair and unbiased recruitment process. Reinforce the organization's values and principles and make it clear that compromising on integrity is not an option.
- **Report to higher authorities if necessary:** If the pressure persists or becomes unmanageable, it may be necessary to report the issue to higher authorities within your organization. Seek guidance from your superiors or the human resources department to address the situation appropriately.

Question (PTU 2019, 2023, 5 marks)

What do you mean by reaction and response? Give some examples.

Answer

React: Your child breaks something. You immediately react by getting angry, perhaps yelling, upsetting the child and yourself, worsening your relationship, not making anything better.

Respond: Your child breaks something. You notice your anger reaction, but pause, take a breath, and consider the situation. First response is to see if your child is OK — is she hurt, scared? Second, realize that the object that is broken, in the larger view, is not that important. Let it go, adjust to a world without it. Third, help her clean up, make a game of it, show her that mistakes happen and that it’s not something to dwell on. Fourth, calmly talk about how to avoid mistakes like that in the future, and give her a hug.

'Do you have the patience to wait till your mud settles and the water is clear?

– Lao Tzu

Much of our lives is spent in reaction to others and to events around us. The problem is that these reactions might not always be the best course of action, and as a result, they can make others unhappy, make things worse for us, make the situation worse.

Question (GTU 2021, 7 marks)

Presume that pawan is a senior officer working for cyber security agency. He comes to know that his junior officer has been a victim of honey trapping through social media. In all of this, his phone was hacked and confidential files were leaked. The entire department has come together and wants pawan to take strict actions against junior officer for his behaviour. That junior officer is highly skilled and is an asset to organization. He is also close to pawan as he had mentored him throughout and respects him a lot.

Moreover, any action against him might attract media attention and bring a bad repute to the entire organization at large.

(i) What are the ethical issues involved and options available to pawan in such a situation?

(ii) Suggest a course of action that pawan would take to resolve it.

Answer

Facts

- Junior officer honey trapped.
- Confidential information leaked.
- Department wants strict action.
- Officer is highly skilled and valuable asset.
- Close personal relations with him.
- Media attention might bring bad repute to the organization.

Stakeholders

- Junior officer
- Intelligence organization
- Self (senior officer)
- Media
- Civil society organizations
- Government

Ethical issues involved

- **Human emotions:** Officers, despite being trained to adhere to confidentiality norms, are tricked by spies for gaining sensitive information. This shows the vulnerability of human emotions which can be a risk to national security.
- **Breach of trust:** Such incidents erode people's trust on intelligence agencies for upholding national security.
- **Empathy towards colleagues:** Close personal relations with the junior officer and his meritocracy might hinder taking strict action against him.
- **Media scrutiny:** Risk of defamation of officers before proper investigation.

Options available

1. Taking strict action against the junior officer.

- Loss of valuable asset to the organization.
- May bring bad repute to the organization

2. Giving warning without any strict punishment

- Setting wrong precedent for the future.
- Risk of further information leakage.

Option (1) seems to be the suitable choice as national security and professional ethics precede personal relations and empathy with the junior officer.

Course of action

- Following Standard Operating Procedures (SOP) and forming an investigation team for fact finding. Estimating the impact of the information leak should be the utmost priority.
- Temporarily suspending the junior officer and taking into custody all his digital media access.
- Reporting to higher authorities so that suitable action can be initiated at an appropriate level. Taking help from cyber security expert team to identify any other similar cases.
- Addressing media so as to handle the case with integrity and professional ethics considering the sensitivity of the issue.
- Taking long term measures like organizing training camps regarding honey trapping and cyber security for officers posted at high risk areas.

Question (GTU 2023, 7 marks)

Suggest the ethical solution for given condition with justification and its possible consequences. "Suppose you are the collector of a district. There is a river near the city. There is currently no bridge over it. A boat has to be taken to cross the river. Which takes a lot of time. But 1000 people get daily bread from it. As a collector you have to make the right ethical decision to build a bridge over this river."

Answer

As the district collector, you are faced with a situation where constructing a bridge over the river could significantly improve the lives of the people in your district.

To make an ethical decision, he should consider the following factors:

- **Benefit to the community:** Building a bridge would provide a more efficient and convenient means of transportation for the 1000 people who rely on the boat to cross the river daily. It would save them time and effort, allowing them to utilize their resources more effectively. Consider the overall impact on the well-being and quality of life of the community.
- **Safety and well-being:** Taking a boat every day may pose risks to the people, especially during adverse weather conditions or emergencies. A bridge would offer a safer mode of transportation, reducing the chances of accidents or mishaps and ensuring the well-being of the community members.
- **Economic considerations:** Assess the economic implications of building a bridge. Consider the potential increase in trade, commerce, and tourism resulting from improved accessibility. Evaluate the long-term benefits and potential economic growth that the bridge may bring to the district.
- **Environmental impact:** Examine the environmental consequences of constructing a bridge. Evaluate the potential impact on the river ecosystem, wildlife, and the surrounding environment. Consider measures to minimize environmental harm during the construction and operation of the bridge.
- **Cost and feasibility:** Analyze the financial feasibility of building a bridge. Evaluate the costs involved in construction, maintenance, and operation, and consider the available budget. Explore funding options, such as government schemes, public-private partnerships, or seeking assistance from higher authorities.

Question (BPUT 2018, 8 marks)

Give an example for standing a test of accountability in an engineering project or a product with a willingness to submit to a moral scrutiny.

Solution

Let's consider an example of an engineering project involving the construction of a new residential building. In this scenario, the engineering firm responsible for the project demonstrates a willingness to submit to moral scrutiny and stands the test of accountability in the following way:

- **Safety and Structural Integrity:** The engineering firm conducts a thorough analysis of the building's design and ensures that it meets all necessary safety standards and regulations. They engage independent structural engineers to review and verify the design, providing an additional layer of scrutiny to ensure the building's structural integrity.
- **Environmental Considerations:** The engineering firm takes into account the environmental impact of the project. They conduct an environmental impact assessment, considering factors such as energy efficiency, waste management, and sustainable construction practices. They strive to minimize the project's carbon footprint and implement eco-friendly solutions where possible.
- **Ethical Sourcing and Labour Practices:** The engineering firm demonstrates accountability by promoting ethical sourcing of materials and labour practices. They engage suppliers who adhere to fair trade principles and use sustainable materials. They ensure that the workers involved in the construction are provided fair wages, safe working conditions, and reasonable working hours.
- **Transparency and Communication:** Throughout the project's lifecycle, the engineering firm maintains open and transparent communication with all stakeholders, including the client, regulatory bodies, and the community. They provide regular updates on the project's progress, address concerns promptly, and seek feedback from relevant parties.
- **Post-Construction Evaluation:** After the completion of the building, the engineering firm conducts a post-construction evaluation to ensure that the project meets the established quality standards. They inspect the building for any potential issues and rectify them promptly, if necessary, to ensure the safety and satisfaction of the occupants.

ASSIGNMENT

Q.1. (PTU 2019, 5 marks): List down any two changes that you could see in your thought, your behaviour and your work after undergoing this course. Briefly explain what made those changes happen?

Answer: Described in this module.

Q.2. (AU 2020, GTU 2022, 2 marks): Define ethics.

Answer: Described in this module.

Q.3. (JNTUK 2023, 10 marks): Mention some universally accepted ethical principles.

Answer: Described in this module.

Q.4. (JNTUK 2023, 4 marks): Define 'Ethical Egoism'.

Answer: In "ethical egoism" right action consists in always promoting what is good for oneself, with no presumption that the self is defined in terms of caring and community relationships.

Q.5. (AU 2021, 8 marks): Explain the sense of engineering ethics.

Answer: Described in this module.

Q.6. (JNTUH 2018, 8 marks): Discuss the scope and aims of engineering ethics.

Answer: Described in this module.

Q.7. (GTU 2022, 4 marks): Differentiate between Morality and Law.

Answer: Described in this module.

Q.8. (BPUT 2018, 10 marks): What are the issues in engineering ethics you know? Explicate.

Answer: Described in this module.

Q.9. (AU 2021, 8 marks): How do you think engineers abuse their profession?

Q.10. (GTU 2021, 4 marks): Provide some appropriate ways for creating an ethical working environment.

Answer: Described in this module.

Q.11. (JNTUH 2020, 4 marks): What are the challenges at work place that one comes across with?

Q.12. (AU 2020, 2021, JNTUH 2020, 16 marks): What are environmental ethics? Discuss the importance of environmental ethics.

Answer: Described in this module.

Q.13. (GTU 2021, 3 marks): Briefly describe the normative theory of business ethics.

Answer: Normative theory involves arriving at moral standards that regulate right and wrong conduct. In a sense, it is a search for an ideal litmus test of proper behaviour. Normative ethics is also sometimes called moral philosophy.

There are three main types of normative ethical theories: consequentialism, deontology, and virtue ethics. Each theory has different ways of approaching moral problems. For example, a consequentialist might focus on the results of an action, while a deontologist might focus on the intentions behind the action.

Q.14. (AU 2020, GTU 2023, 16 marks): Discuss the role and importance of ethics in business organization.

Answer: Described in this module.

Q.15. (GTU 2022, 3 marks): How corporate culture will help to develop Ethical Environment in company.

Answer: Described in this module.

Q.16. (GTU 2022, 3 marks): What is unethical practice in Business? List and explain any 5 of them.

Answer: Described in this module.

Q.17. (GTU 2021, 7 marks): Mention the need for businesses to act ethically.

Answer: Described in this module.

Q.18. (GTU 2021, 4 marks): Briefly elaborate below statements in context to why they cannot be considered business ethics:

(i) Ethics is different from religion.

(ii) Ethical Standards are different from cultural traits.

Answer: Described in this module.

Q.19. (GTU 2021, 2022, 2023, 4 marks): Distinguish between personal and business ethics by providing appropriate example.

Answer: Described in this module.

Q.20. (BPUT 2020, 16 marks): Explain the Global ethical issues threatening social development (min. four).

Answer: Described in this module.

Q.21. (AU 2020, 16 marks): Give note on "Employee Rights" and its role in a Business Organization.

Answer: Described in this module.

Q.22. (AU 2020, 2021, BPUT 2018, 2020, JNTUH 2020, 16 marks): Explain about code of ethics. Brief on the importance of Code of Ethics. Write down its significance and limitations.

Answer: Described in this module.

Q.23. (GTU 2021, 2023, 7 marks): Neelam is working as senior HR manager at Zion IT company. Mention the code of personal ethics she needs to possess as an employee of the organization.

Answer: Described in this module.

Q.24. (AU 2020, 2 marks): What is service learning?

Answer: Service learning refers to learning the service policies, procedures, norms, and conditions, other than 'the technical trade practices'. The service learning includes the characteristics of the work, basic requirements, security of the job, and awareness of the procedures, while taking decisions and actions.

It helps the individuals to interact ethically with colleagues, to effectively coordinate with other departments, to interact cordially with suppliers as well as the customers, and to maintain all these friendly interactions.

Q.25. (AU 2020, JNTUK 2023, 2 marks): What is self-interest?

Answer: Self-interest is being good and acceptable to oneself. It is pursuing what is good for oneself. It is very ethical to possess self-interest. As per utilitarian theory, this interest should provide for the respect of others also. Duty ethics recognizes this aspect as duties to ourselves. Then only one can help others. Right ethicist stresses our rights to pursue our own good.

Q.26. (JNTUH 2020, 8 marks): Explain two senses of loyalty.

Answer: Described in this module.

Q.27. (GTU 2022, 3 marks): Explain Morality in short.

Answer: Described in this module.

Q.28. (AU 2020, JNTUH 2018, JNTUK 2023, 16 marks): Explain Gillian Theory of Moral Development.

Answer: Described in this module.

Q.29. (BPUT 2020, 16 marks): Describe the Jean Piaget's theory of moral development by mentioning the thought process of two groups of children on different aspects.

Answer: Described in this module.

Q.30. (BPUT 2020, 6 marks): Write a note on moral absolutism.

Answer: Described in this module.

Q.31. (GTU 2022, 2023, 4 marks): What is Ethical Dilemmas? Explain with example.

Answer: Described in this module.

Q.32. (AU 2020, 2021, JNTUH 2020, 2 marks): Define moral dilemmas.

Answer: Described in this module.

Q.33. (BPUT 2018, 2020, 5 marks): Methods to resolve Ethical Dilemma.

Answer: Described in this module.

Q.34. (AU 2021, 8 marks): Explain Kohlberg's theory, Gilligan's theory and Heinz's dilemma.

Answer: Described in this module.

Q.35. (BPUT 2018, GTU 2021, 2022, 2023, 10 marks): Discuss the Kohlberg's theory of moral development with a sequential diagram.

Answer: Described in this module.

Q.36. (AU 2020, 2 marks): What is Moral Leadership?

Answer: Engineers provide many types of leadership in the development and implementation of technology, as managers, entrepreneurs, consultants, academics and officials of the government. Moral leadership is not merely the dominance by a group. It means adopting reasonable means to motivate the groups to achieve morally desirable goals. This leadership presents the engineers with many challenges to their moral principles.

For example, Mahatma Gandhi never used power and his charismatic personality, his conviction, honesty, integrity, and the ability to guide people towards the goal makes him respected all over the world even today. This is moral leadership.

Q.37. (AU 2020, JNTUH 2020, 2 marks): What is meant by engineering as experimentation?

Answer: Described in this module.

Q.38. (BPUT 2020, 2 marks): What are the similarities in engineering and other scientific experiments?

Answer: Scientists strive to understand nature, engineers to transform nature for serving people. They complement each other, for to transform nature effectively requires proper understanding, and to discover nature's secrets requires instruments to modify it in experiments. Because they both address nature, they share many knowledge and methods.

Q.39. (AU 2020, 16 marks): How can Engineer become a responsible Experimenter ? Explain in detail.

Answer: Described in this module.

Q.40. (BPUT 2020, JNTUH 2018, 6 marks): Write a note on roles and responsibilities of an Engineer.

Answer: Described in this module.

Q.41. (BPUT 2018, 10 marks): What are the characteristics, roles and responsibilities of a professional?

Answer: Described in this module.

Q.42. (BPUT 2020, 16 marks): Critically mention and evaluate the roles and responsibilities of a professional by describing the duties towards the organization and society.

Answer: Described in this module.

Q.43. (JNTUK 2023, 6 marks): Need of commitment in engineering profession.

Answer: Described in this module.

Q.44. (AU 2021, 2 marks): Comment on the code, ‘‘Engineers shall issue public statements in an objective and truthful manner”.

Answer: Described in this module.

Q.45. (AU 2020, 2 marks): What is the role of law in Professional Ethics?

Answer: Described in this module.

Q.46. (AU 2021, 2 marks): Comment on the code, ‘‘Engineers shall issue public statements in an objective and truthful manner”.

Answer: Described in this module.

Q.47. (GTU 2021, 3 marks): Mention principles of professional ethics.

Answer: Described in this module.

Q.48. (BPUT 2018, 4 marks): Discuss the need to focus on professional ethics.

Answer: Described in this module.

Q.49. (PTU 2019, 2023, 5 marks): Explain Competence in Professional-Ethics.

Answer: Described in this module.

Q.50. (AU 2020, 2 marks): What is Collective Bargaining?

Answer: Described in this module.

Q.51. (AU 2020, 2021, 16 marks): Discuss on the importance of collective bargaining.

Answer: Described in this module.

Q.52. (AKTU 2019, 10 marks): How do the current world views lead to contradictions and dilemmas in professional life? Explain.

Answer: Described in this module.

Q.53. (AKTU 2019, 10 marks): Give a critical review of the current management models in profession.

Q.54. (AU 2021, 8 marks): Discuss the various models of professional roles.

Answer: Described in this module.

Q.55. (AKTU 2022, PTU 2019, 2023, 10 marks): Explore the issues in professional ethics in the current scenario. List any five unethical practices in the profession today and the methods being tried to curb them. Comment on the long term effectiveness of these methods.

Answer: Described in this module.

Q.56. (GTU 2022, 7 marks): List and Explain sources of Ethical Behaviour.

Q.57. (GTU 2021, 4 marks): Enlist roots of unethical behaviour and the factors that contribute the employees to think in an unethical manner.

Answer: Described in this module.

Q.58. (GTU 2023, 7 marks): Discuss the causes of unethical behaviour in private business.

Answer: Described in this module.

Q.59. (AKTU 2022, 10 marks): What in your opinion has gone wrong so as to make many of the moderate technology gadgets anti-ecological as well as contrary to real human welfare? After all these developments have been made for the good of people and with great dexterity.

Hint: See computer ethics.

Q.60. (AU 2020, 16 marks): Discuss in detail about the moral and ethical issues involved in use of computers.

Answer: Described in this module.

Q.61. (JNTUH 2018, 8 marks): What are computer ethics? Elaborate how computers are used for unethical acts.

Answer: Described in this module.

Q.62. (AU 2021, 16 marks): What do you understand by 'transfer of appropriate technology'? In this context discuss the ethical issues involved in the Bhopal Gas tragedy. Suggest some tips for safe transfer of appropriate technology.

Answer: Described in this module.

Q.63. (JNTUH 2020, 8 marks): Present a case study of any disaster that happened due to the lapses in engineering design.

Answer: Described in this module (Bhopal gas tragedy).

Q.64. (BPUT 2018, 10 marks): You are a chief engineer of a famous steel plant and in the time of recruitment you are pressurized by your closed subordinate to infuse their candidates. Put your views to handle this situation.

Answer: Described in this module.

Q.65. (BPUT 2020, JNTUH 2018, 2 marks): What is whistle blowing?

Answer: Described in this module.

Q.66. (JNTUH 2020, 8 marks): When should whistle blowing be attempted?

Answer: Described in this module.

Q.67. (PTU 2019, 2023, 5 marks): What do you mean by reaction and response? Give some examples.

Answer: Described in this module.

Q.68. (GTU 2021, 3 marks): Enlist at least four characteristics of quality of working life. How alternate work schedules helps to improvise and achieve standard quality of working life?

Hint: Safer Working Conditions, Equitable and Fair Pay, Job Satisfaction, Job Security and Autonomy and Control.

Q.69. (GTU 2021, 7 marks): Presume that pawan is a senior officer working for cyber security agency. He comes to know that his junior officer has been a victim of honey trapping through social media. In all of this, his phone was hacked and confidential files were leaked. The entire department has come together and wants pawan to take strict actions against junior officer for his behaviour. That junior officer is highly skilled and is an asset to organization. He is also close to pawan as he had mentored him throughout and respects him a lot.

Moreover, any action against him might attract media attention and bring a bad repute to the entire organization at large.

(i) What are the ethical issues involved and options available to pawan in such a situation?

(ii) Suggest a course of action that pawan would take to resolve it.

Answer: Described in this module.

Q.70. (GTU 2021, 4 marks): Describe how failure of personal character can be considered as one of the sources of ethical problems stating one real life scenario.

Hint: See personal ethics.

Q.71. (GTU 2023, 7 marks): Suggest the ethical solution for given condition with justification and its possible consequences. "Suppose you are the collector of a district. There is a river near the city. There is currently no bridge over it. A boat has to be taken to cross the river. Which takes a lot of time. But 1000 people get daily bread from it. As a collector you have to make the right ethical decision to build a bridge over this river."

Answer: Described in this module.

Q.72. (BPUT 2018, 8 marks): Give an example for standing a test of accountability in an engineering project or a product with a willingness to submit to a moral scrutiny.

Answer: Described in this module.

Q.73. (AKTU 2021, 5 marks): Explain the term 'holistic technology'. Take any two such examples from the technologies developed in Indian history and evaluate if they are holistic.

Answer: Described in this module.

Q.74. (AKTU 2022, 10 marks): What do you mean by holistic technology? Write down a few characteristics of holistic technology. Explain the role of human values in developing holistic technologies.

Answer: Described in this module.

Q.75. (GTU 2022, 2023, 7 marks): Explain the problems for the sustenance of value in the process of technological changes.

Answer: Described in this module.

Q.76. (RTU 2023, 5 marks): List some of the specific criteria for holistic evaluation of technologies.

Answer: Described in this module.

Q.77. (GTU 2020, 4 marks): Which technological changes are important for sustenance of values according to you? Explain in brief.

Answer: Technological changes can have significant economic and social implications. While they can create new opportunities and increase efficiency, they can also disrupt industries, displace jobs, and exacerbate inequalities. Managing the societal impact of technological changes is crucial to ensure the sustainable value creation. This involves addressing issues such as job displacement through retraining programs, promoting equitable access to technology, and considering the ethical implications of new innovations.

Q.78. (RTU 2022, 2 marks): What is eco friendly production systems?

Answer: The term eco-friendly can mean different things to different people, but in general it refers to taking steps to protect the environment, such as using recycled materials, conserving energy, and reducing pollution.