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1.1 MAN AND SOCIETIES

Man is a Social Animal

Though accurate information about the exact origin of society is not known still it is an accepted fact that man has been living in society since time immemorial. Man has to live in society for his existence and welfare. In almost all aspect of his life he feels the need of society. Biologically and psychologically he is compelled to live in society. Because a complete isolated life is unbearable for him and he can't develop into a normal individual in isolation. The essence of the fact is that man has always belonged to a society of some sort, without which he can't exist at all. Society fulfills all his needs and provides security to him. He took birth,

grows, live and die in society. Without society his life is just like fish out of water. That is why famous Greek Philosopher Aristotle remarked more than two thousand three hundred (2300) year before that, "Man is a social animal."

The term society has been derived from the Latin word "Socius" which means a companion, association or fellowship, It is because man always lives in the company of his fellow beings. This led George Simmel to remark that sociability is the essence of society. The term society is understood in different sense. In our day-to-day discussion society is used to refer to the members of specific in group; *for example*; Adivasi society, Harijan society, etc. Some other time it refers to some institutions like Arya Samaj, Brahmo Samaj. At some other time, society refers to an association like customer's society, co-operative society or cultural society. Society is also used in the sense of a group such as rural society or urban society.

The concept of Society does not refer simply to a group of people associated for a social life .But; society refers not to a group of people only but to the complex pattern of the norms, interaction and relationships that arise among them. A person exists only as an agent of social relationships. Mere congregation of individuals does not constitute society. Rather society refers to the complex network of social relationships by which every individual is interrelated with his fellowmen. Hence,, society is abstract, not concrete, in nature. We can't touch it but feel it. Society resides in the minds of individual. Society is a process of living not a thing, a motion rather than structure. A system of social relationships is the most important aspect of society. Not all relationships are social. A social relationship implies reciprocal awareness among individuals. This reciprocal awareness direct and indirect is the characteristics of every social relationship.

1.1.1 Definitions of society

According to Ginsberg, "A society is a collection of individuals united by certain relations or modes of behaviour which mark them off from others, who do not enter into those relations or who differ from them in behaviour."

According to F.H. Giddings, "Society is the union itself, the organization, the sum of formal relations in which associating individuals are bound together".

According to G.D.H. Cole, "Society is the complex of organized associations and institutions within the community".

According to J.F. Cuber, "A society may be defined as a group of people who have lived long enough to become organized and to consider

themselves and be considered as a unit more or less distinct from other human units."

1.1.2 Characteristics of society

A comprehensive understanding of society requires a thorough analysis of its characteristics. But the term society could be understood both from a narrower and broader sense. In a narrower sense society refers to a group of people but in a broader sense it refers to the whole human society. However, society has the following characteristics:

i) Population

A society must have population. Without a group of people no society could be formed. Of course society refers not to a group of people but to a system of social relationships. But for the establishment of social relationships a group of people is necessary. This population is a self-perpetuating individual who reproduces it through some sort of mating relationship. Hence, it is the first requirement of society.

ii) Likeness

Likeness is the most important characteristics of society. Famous sociologist MacIver opines that society means likeness. Without a sense of likeness, there could be no mutual recognition of 'belonging together' and therefore no society. This sense of likeness was found in early society on kinship and in modern societies the conditions of social likeness have broadened out into the principles of nationality. Society consists of like bodied and like-minded individuals. Friendship intimacy and association of any kind would be impossible without likeness. It also helps in the understanding of one by the other. That is why F.H. Giddings opines that society rests on the 'conscious of kind'.

iii) Differences

Along with likeness differences is another important characteristic of society. Because society involves differences and it depends on is as much as on likeness. That is why Maciver opines that primary likeness and secondary differences create the greatest of all institutions, the decision of labour. Because differences is complementary to social relationship. If people will be alike in all respect society could not be formed and there would be little reciprocity and relationship became limited. Family as the first society based on biological differences and differences in aptitude, interest and capacity. Though differences is necessary for society but differences by itself does not create society. Hence, differences are sub-ordinate to likeness.

iv) Interdependence

Interdependence is another important characteristic of society. This fact of inter dependence is visible in every aspect of present day society. Famous Greek Philosopher remarked that 'Man is a social animal'. As a social

animal he is dependent on others. The survival and well-being of each member is very much depended on this interdependence. No individual is self-sufficient. He has to depend on others for food, shelter and security and for the fulfillment of many of his needs and necessities. With the advancement of society this degree of interdependence increases manifold. Family being the first society based on the biological interdependence of the sexes. Not only individuals are interdependent but also the groups, communities and societies.

v) Cooperation and conflict

Both co-operation and conflict are two another important characteristics of society. Because famous sociologist Maciver once remarked that "Society is cooperation crossed by conflict". Co-operation is an essential component for the formation of society. Without co-operation there can be no society. People can't maintain a happy life without co-operation. Family being the first society rests on co-operation. Cooperation avoids mutual destructiveness and results in economy in expenditure

vi) **Co-operation, conflict** is also necessary for society. It acts as a cementing factor for strengthening social relations. In a healthy and well developed society both co-operation and conflict co-exist. Because, with the help of these two universal process society is formed. Conflict makes co-operation meaningful. Conflict may be direct and indirect.
However, both are necessary for society.

vii) Society is a network or web of social relationship

Social relationship is the foundation of society. That is why famous sociologist Maciver remarked that society is a network of social relationship. Hence, it is difficult to classify social relationships. But this social relationship is based on mutual awareness or recognition to which Cooley call we feeling, Giddings call consciousness of kind and Thomas as common propensity. Without these social relationships no society could be formed. As social relationships are abstract in nature so also the society is abstract in nature. Different kinds of social processes like cooperation, conflict constantly takes place in society. And the relationships established around these create society. Hence, a network of social relationships which created among individuals constitutes society.

viii) Permanent nature

Permanency is another important characteristic of society. It is not a temporary organization of individual. Society continues to exist even after the death of individual members. Society is a coherent organization.

ix) Society is abstract

Society is an abstract entity. As Maciver opines, society is a web of social relationships. We can't see this relationship but we can feel it. Hence, it is an

abstract concept. Wright has aptly remarked that "Society in essence means a state or condition, a relationship and is, therefore, necessarily an abstraction". Besides society consists of customs, traditions, folkways, mores and cultures which are also abstract. Hence, society is abstract in nature.

x) Society is dynamic

The very nature society is dynamic and changeable. No society is static. Every society is always in a state of continuous change. Old customs, traditions, folkways, mores, values and institutions got changed and new customs and valves takes place. Society changes from its traditional nature to modern nature. Hence,, it is one of the most important characteristics of society.

xi) It's cultural pattern to the succeeding generations.

xii) Something more than mere collection of individuals: No doubt society consists of individuals. But mere collection of individuals is not society. It is something more than and something beyond the individual. Durkheim is right when he remarked that society is more than the sum of its part *i.e.*, individuals.

xiii) Accommodation and assimilation

This two associative social process is also important for the smooth functioning and continuity of society.

Apart from the above characteristics, famous sociologists MacIver and Page in their definition mentions some of the **elements of society** which are described below:

i) Usages : Every society has some usages concerned with marriage, religion, education etc. These usages differ from society to society.

ii) Procedures : In every society there are some procedures like modes of action which helps to maintain its unity.

iii) Authority : Every society has some sort of authority. Every members of society has to obey this authority. Some sort of authority is necessary for the maintenance of order in society.

iv) Mutual Aid : In every society there exists a feeling of mutual aid among its members. Everyone needs helps from others.

v) Groupings and divisions: In every society there exist several groupings and divisions like family, village, city, etc. which constitute a society.

vi) **Controls** : Every society exercises some sort of controls over its members. Hence, control is necessary for the smooth organization of a society.

vii) **Liberty** : Along with control every society gives some liberty to its members some sort of liberty or freedom is necessary for the organization of society. But control and liberty is not opposite to each other.

Thus, society is a permanent institution. Its exact origin is unknown to history. It emerged from the original instincts of man and continues to exist till the existence of man. It is not a mere structure. It refers to the whole system of social relationships. It rests on the state of mind of individuals who comprise society.

1.1.3 Types of Society

The planet on which man lives is made up of people in social relationship with each other. It breaks down into specific societies, where people with a common culture carry on a shared life based on their interdependence. The type of society has not been the same everywhere on this planet nor has it been similar throughout the course of human history. Three main types of society tribal, agrarian and industrial have been marked out on this globe. The African society is tribal; the Indian society is agrarian while the American society is industrial. A brief description of the structure and the features of these societies follow:

i) Tribal society

Before we examine the structure and features of tribal society it would be relevant to understand the meaning of the word "Tribe" as used in Sociology. According to George Peter Murdock, tribe is a social group in which there are many clans, nomadic bands, villages or other sub groups which usually have a definite geographical area, a separate language, a singular and distinct culture and either a common political organization or at least a feeling of common determination against the strangers. As defined in the Imperial Gazetter of India, 'A tribe is a collection of families bearing a common name, speaking a common dialect, occupying or professing to occupy a common territory and is usually not to Bogardus, "The tribal group is based on the need for protection, on ties of blood relationship and on the strength of a common religion." The tribe is a group of persons having a common definite territory, common dialect, common name, common religion and a common culture. They are united by blood relationship and have a peculiar political organization.

ii) Agrarian society

Societies are classified on the basis of dominant types of economic activity into agrarian and industrial societies. In an agrarian society the dominant

type of economic activity is agricultural whereas in an industrial society factory production is the dominant type of economic activity. Only in the past century and a half has the world known industrial society. Even today, from two-third to three-fourth of the worlds people live in agrarian or peasant societies.

The earliest men lived in relatively small bands, formed on the basis of basis of family and blood ties. Their economy consists of seed and root gathering, of hunting and fishing. The Neolithic Revolution marks one of the greatest changes in the history of society, one matched only by the industrial revolution. The Neolithic Revolution began in the Nile Valley about 13,000 years ago. It spread to central and western Europe three or four thousand years later. During this period, men began to polish some of their stone tools, giving them a sharper cutting edge, and they invented the arts of pottery and weaving. But these were not the most important changes. It was the domestication of plants and animals which laid the foundation of agrarian society.

The development of agriculture greatly altered the social structure and institutions. The new form of economy made possible a more rapid in population. It is also meant a more settled abode. Man formed villages and thereby created the need for new forms of social structure and social control.

iii) Industrial society

A very important factor in the history of society has been the Industrial Revolution which has brought about far-reaching consequences in the structure of societies. Prior to the Industrial Revolution most workers secured their own raw materials and owned their own tools. They worked under their own roofs on their own time, and determined both the quality and quantity of what they produced and sold the finished product to the consumer. The worker took pride in his product and he used to establish his reputation as a man who had made the best product. He lived a life of simplicity controlled by traditional community mores. His children saw his father working on the product, helped him and gradually learnt the job of the father.

This social structure began to change with the beginning of Industrial Revolution. An entrepreneur, an individualist capitalist came in and took over some of the operations. He was an intelligent, ambitious man and established a factory. He secured the raw materials, gauged the market, and took workers from under their own roofs to produce things in his factory. He took the produce and sold it. In this process the worker came to be separated from the means of production. He now owned neither the raw material, nor the tools, nor the building nor the product. He was now a labour. Factory production, fixed capital and free labour were the characteristics of this revolution.

As a result of this economic revolution, several important alterations occurred in the social structure and a new type of society called industrial society was born.

1.1.4 Community

Community is "a human population living within a limited geographic area and carrying on a common inter-dependent life. "It is" any circle of people who live together and belong together in such a way that they do not share this or that particular interest only, but a whole set of interests. "Community is "a social group with some degree of "we feeling" and "living in given area". Community is "the smallest territorial group that can embrace all aspects of social life. "Community is "a group of social beings living a common life including all the infinite variety and complexity of relations which result from that common life or constitute it."

"By a community we mean a complex of social life, a complex including a number of human beings, living together under conditions of social relationships, bound together by a common, however constantly changing stock of conventions, costumes and traditions and conscious of some extent of common social objects and interests."

Elements of a community

The following are the elements on the basis of which we can decide whether a particular group is a community or not:

i) Group of people

Community is a group of people. Whenever the individuals live together in such a way that they share the basic conditions of a common life, we call them forming a community.

ii) Locality

The group of people forms a community when it begins to reside in a definite locality. A community always occupies a territorial area. The area need not be fixed forever. The people may change their area of habitation from time to time just as nomadic community does. However most communities are now well settled and derive a strong bond of solidarity from the conditions of their locality. Among the village people there is unity because they reside in a definite locality. Though due to the extending facilities of communication in the modern world the territorial bond has been weakened, yet "the character of locality as a social classifier has never been transcended."

iii) Community sentiment

Community sentiment means a feeling of belonging together. It is 'we feeling' among the members. In modern times this sentiment very much lacks among the people occupying a specific local area. *For example;* in big cities a man does not know even his next door neighbor. Mere neighborhood does not create a community, if community sentiment is lacking. Therefore, to create a community the sentiment of common living must be present among the residents of the locality.

iv) Permanency

A community is not transitory like a crowd. It essentially includes a permanent life in a definite place.

v) Naturality

Communities are not made or created by an act of will but are natural. An individual is born in a community

vi) Likeness

In a community there is a likeness in language, customs, mores, etc. According to Green, "A community is a cluster of people living within a narrow territorial radius, who share a common way of life."

vii) Wider Ends

In communities the people associate not for the fulfillment of a particular end. The ends of a community are wider. These are natural and not artificial.

viii) Particular Name

Every community has some particular name. In the words of Lumley, "It points identity, it indicates reality, it points out individuality, it often describes personality and each community is something of a personality." *For example;* people living in Punjab are called Punjabis while those living in Kashmir are called Kashmiris.

ix) No Legal Status

A community is not a legal person. It cannot sue, nor can it be sued. In the eyes of law, it has no rights and duties.

x) Size of community

A community may be big or small. A big community such as a nation will contain within a number of small communities and groups with more close bonds of unity and more numerous common qualities. Today, efforts are being made to extend the limits of community so as to include the whole earth and create one world community.

Differences between community and society

i) Community sentiment

A community as seen above is a group of people who live together in a particular locality and share the basic conditions of a common life. To constitute a community the presence of sentiment among the members is necessary. Society includes every relation which is established among the people. It is the name of the structure of all social relationships direct or indirect, organized or unorganized, conscious or unconscious, co-operative or antagonistic. There is an element of likeness in society, but it is not necessary that likeness should include the people in oneness, the

enemies can also be included in society. When we think of society we think more particularly of organization, but where we think of community we think of the life Hence, organization springs.

ii) Secondly, society has no definite boundary or assignable limits. It is universal and pervasive. Society is the name of our social relationships. Community, on the other hand, is group of people living together in a particular locality.

iii) **Community a species of society**

Community is the species of society. It exists within society and possesses its distinguishable structure which distinguishes it from other communities. Some communities are all inclusive and independent of others. Among primitive peoples sometimes communities of not more than a hundred persons are found which were almost isolated. Small communities exist within greater communities; the village within a town, the town within a region, the region within a nation.

iv) Community is concrete, society is abstract. Society is a network of social relationships which cannot be seen or touched. It is an abstract concept. On the other hand, community is a concrete concept. It is a group of people living in a particular locality and having a feeling of oneness. We can see this group and locate its existence.

1.1.5 Social change

1.1.5.1 Definition of social change

Any alternation or modification that occurs in a situation over a time is called social change. It is the change in human interactions and inter-relations. If comes to change there are sources which are greatly responsible for change. The first source is unsystematic and unique factors day or night, climate, existence of people or groups. The second source is systematic factors like if we need sound development there must be a stable and flexible government and system as well as different social organization.

Kingsley Doris "By social change is meant only such alternations as occur in social organization i.e., the structure and functions of society".

Merril and Elbridge "Social change means, that large no. of persons are engaging in activities that differ from those which they or their immediate fore-fathers engaged in some time before."

Gillin and Gillin "Social changes are variations from the accepted mode of life, whether due to alteration in geographical condition, in cultural equipment, composition of the population. Or ideologies and whether brought about by diffusion or inventions within the group."

Jones' "Social change is a term used to describe variations in or modification of any aspect of social process, social patterns, social interaction or social organization."

Factors causing social change

Main factors which affect social change can be discussed a follows:

i) **Natural factors**

Natural forces and factors play an important role in unifying or disintegrating the society. Although human beings have made tremendous progress during the last 150 years or so, yet they have not been able to wield full control over the nature. A storm, earthquake, flood, drought, disease and similar natural events even today can disrupt the social system. Natural calamities like floods, earthquakes, draughts, famines and other natural disasters always force changes in the social conditions and life of the affected people. On the one hand these factors and forces act as a source of big loss for the victims; on the other hand these initiate efforts aimed at rapid reconstruction and development. As such, the natural factors can on the one hand, cause havoc in physical conditions of social life, these may also affect the social conditions in a positive way. Large scale floods in Pakistan in August 2010 inflicted very heavy losses on more than 10 million people of the country. At the same time, these gave rise to very comprehensive human attempts at socio-economic reconstruction and development. Haiti is now getting rebuilt after the devastating earthquake of 2010.

ii) **Geographical factors**

The geographical conditions always affect the social system and act as factors of social change. The cultural life of the people depends upon the physical environment. Progress also depends upon the availability of natural resources, their exploitation and how these being recouped are and preserved. The climate always affects the socio-economic activities of the people. For instance, there is little economic activity at both poles (North and South) due to intense and long spells of cold the speed of social change remains negligible. On the other hand, there is always an intense activity in temperate regions (neither too cold nor too warm), and consequently the speed of social changes is quite fast.

iii) **Biological factors**

Biological factors also affect social change. Biological factors are those factors which determine the structure, selection and hereditary qualities of generations. The human element is ever changing. Each new generation is different from previous generation. It is different in form, ideas and in many other ways from the one gone before.

iv) **Demographic factor**

The demographic factors always influence the process and nature of social change. The population increase or decrease always brings social

problems. When the birth-rate in a society exceeds death-rate, population begins to rise. A constantly rising population gives birth to poverty, unemployment, disease and several other related problems. On the other hand, a low birth-rate means leads to decrease in the size of the population. When population is low, there are fewer skilled hands available and the country cannot make full use of the natural resources. The social conditions deteriorate the size of families shrink and it affects the social relations.

v) Socio-economic factor

The economic factors constitute an important factor of social change. *Marx* said that the entire social structure of a country is determined by economic factors *i.e.*, the means of production and distribution of material means of production and distribution. When there are changes in the means of production *i.e.*, the material productive forces of society, it is always changes the social organization. The birth of the institutions of marriage and family took place under the influence of the means of production of material means of livelihood. With the birth of family wealth and possessions became important.

vi) Cultural factor

The cultural factors also play a role in bringing about social change. Our social life depends upon our beliefs, ideas, values, customs, conventions, institutions and the like. When there is a change in these, it influences the social life. *For example;* let us (consider the system of marriage. To begin with, the ceremonies were religious and people regarded marriage as something sacred and irrevocable. Today we hold a different view. Marriage is held be good for personal comfort. It has affected the thinking in favour of irrevocability of marriage and consequently the number of divorcees has registered a big increase.

vii) Science and technology

In contemporary times science and technology happens to be the most important factor of social change. New scientific inventions and technologies always greatly influence the social life. *Ogburn* and *Nimkoff* rightly observe, "The most wonderful and universal phenomenon of modern life is not capitalism, but science and technology and capitalism is only it's by product. "Mechanization brings changes in the economic structure and relations. This leads to a change in old values, norms and ideals. Technology brings about changes in the physical environment and the material culture of each society which in turn gives birth to social change.

1.1.5.2 Theories on social change

The five theories of social change are as follows:

i) Evolutionary theory

Despite the wide variety in the possible directions change may take, various generalizations have been set forth. Because the lot of mankind generally has improved over the long term, by far the most numerous classes of theories of the direction of change comprise various cumulative or evolutionary trends. Though varying in many ways, these theories share an important conclusion that the course of man's history is marked up 'upward' trend through time. The notion of evolution came into social sciences from the theories of biological evolution. With the advent of Darwinian Theory of biological evolution, society and culture began to be regarded as undergoing the same changes and demonstrating the same trends.

ii) Cyclical theory

Cyclical change is a variation on unilinear theory which was developed by Oswald Spengler (Decline of the West, 1918) and Arnold J. Toynbee (A Study of History, 1956). They argued that societies and civilizations change according to cycles of rise, decline and fall just as individual persons are born, mature, grow old, and die. According to German thinker Spengler, every society has a predetermined life cycle-birth, growth, maturity and decline. Society, after passing through all these stages of life cycle, returns to the original stage and thus the cycle begins again.

iii) Economic (Mandan) theory

Owing largely to the influence of Marx and Marxism, the economic theory of change is also as the Marxian theory of change. Of course, economic interpretations of social change need not be always Marxist, but none of the other versions (such as Veblen who also stressed on material and economic factor) of the doctrine are quite as important as Marxism. The Marxian theory rests on this fundamental assumption that changes in the economic 'infra-structure' of society are the prime movers of social change. For Marx, society consists of two structures-'infra-structure' and 'super-structure'. The 'infra-structure' consists of the 'forces of production' and 'relations of production'.

iv) Conflict theory

Social theorists in the nineteenth and early twentieth century's were concerned with conflict in society. But, the label of conflict theorists is generally applied to those sociologists who opposed the dominance of structural-functionalism. These theorists contend that in functionalism there is no place of change and as such it cannot explain change. They have neglected conflict in favour of a unitary concept of society which emphasizes social integration. By contrast to functionalist approach, conflict theorists contend that institutions and practices continue because powerful groups have the ability to maintain the status quo. Change has a

crucial significance, since it is needed to correct social injustices and inequalities.

v) Technological theory

When the average person speaks of the changes brought about by 'science', he is generally thinking of 'technology' and the manifold wonders wrought thereby. The 'technology' refers to the application of knowledge to the making of tools and the utilization of natural resources (Schaefer and Lamm, 1992). It involves the creation of material instruments (such as machines) used in human interaction with nature. It is not synonymous with machinery as it is understood in common parlance. Machines are the result of the knowledge gained by science but they themselves are not technology. Social change takes place due to the working of many factors. Technology is not only one of them but an important factor of social change. When it is said that almost whole of human civilization is the product of technological development, it only means that any change in technology would initiate a corresponding change in the arrangement of social relationships.

1.1.6 Activities to be governed by the society for its survival

To survive, every society must successfully address the same fundamental social needs. ***Talcott Parsons*** identified six basic fundamental social needs as follows:

i) All societies must organize the activities of the members to obtain the basic goods and services necessary for survival (such as food, clothing, shelter, fuel, potable water).

ii) Societies must protect their members from both external and internal threats. External threats includes invasion by other societies and destructive natural disasters like hurricanes, tornadoes and earthquakes. Internal threats include crime like robbery, murder, rape and health epidemics like AIDS, measles, polio, and the flu.

iii) All societies must replace members lost by death or emigration.

iv) Whenever societies gain new members, they must transmit knowledge of the rights, obligations, responsibilities, and expectations of appropriate behavior to the new members. New members must also be taught the skills they will need to participate as productive member of the society.

v) All society must motivate both new and continuing members to fulfill their responsibilities and conform to expected behaviors.

vi) Finally, societies must develop mechanisms for solving conflicts.

1.2 TECHNOLOGY AND SOCIETY

Technology is technical means, which involves the systematic application of organized knowledge, and tools and materials for the extension of human faculties.

The word *technology* refers to the making, modification, usage, and knowledge of tools, machines, techniques, crafts, systems, and methods of organization, in order to solve a problem, improve a pre–existing solution to a problem, achieve a goal, handle an applied input/output relation or perform a specific function. It can also refer to the collection of such tools, including machinery, modifications, arrangements and procedures. Technologies significantly affect human as well as other animal species' ability to control and adapt to their natural environments. The term can either be applied generally or to specific areas: examples include construction technology, medical technology, and information technology.

"Now a day's technology is define as a study of the, technical means under taken in all culture (a universal), which involve the systematic application of organized knowledge (synthesis) and tangible (tools and materials) for the extension of human faculties that are restricted as a result of the evolutionary process. This definition is more appropriate because it identifies following characteristics of technology.

- It is evident in all cultures regardless of their stage of development.
- It is knowledge based and involves the application of knowledge to solve the problem.
- It is accumulative.
- It is fundamental to humanity.
- It is fundamental to survival.
- It alters the culture and society.
- It is future oriented.
- It seeks a harmonious relationship between human life and nature.
- It is an extension of human faculties.

1.2.1 Impact of technology on society

Due to technology, families are getting more and more facilities and their living standard is being raised. They can use every kind of comfortness as they wish such as furniture, cloths, entertainment such T.V., telephone, computer etc. The introduction of fuels and other energy sources has replaced the physical activities to mechanical activities.

As we are human beings, more than half percent of our life remains within our family boundary. But people are changing their family system along with the improvement of the technology they have known and availability of physical facilities. Due to busy life, family members get less time to discuss family problems. Hence, the joint family system is now being replaced by nuclear family system.

Within the family itself, every family member may have different fields of working and there may not be any interconnection among them which may cause lack of information about family problems among them. Every

member has job oriented, commercialized thinking and money minded. They are concerned for time saving. Sharing of time of the members within the family is being decreased day by day resulting creation of conflict between the family members.

In Nepalese family system, women mostly manage family system. Without effectiveness of women in managing the family, the family system gets strongly damaged. So, technology has also played great role in changing women life system. Followings are some examples:

i) Women are considered equal to men in all aspects.
ii) Problem to dowry has been reduced to some extent.
iii) Women in urban areas have got more opportunities to employment.

In present situation, everybody should know the technological operation of tools, machine and electronics, otherwise they will be back in technological society and their social value will be less.

Technology creates opportunity for social change

Science and Technology are overall advantageous to society. We realize that society should be thankful for all the benefits that technology has provided, allowing humans to lead comfortable and convenient lives. If society could understand that technology does create many problems and actively participate in the effort to resolve these problems, they would see that the positive effects could outweigh the negative effects, who would give up all that technology and science has provided to avoid the detriments that could possibly result? Although technology creates many problems, the solution is not to give up all that we have gained from it, but to address these problems, and then continue to reap their benefits.

i) **Families and modern technology**
- Due to technology people migrating for job, carrier, better opportunity, breaking the tradition of joint family
- Greater number of working women
- Sense of companionship is taking place on the society among the family members

ii) **Economy**
- Change in economy due to technology, broader market, wide area of global economy
- High productivity due to technology
- High consumption due to low price

iii) **Politics**
- By using technology more resources are used to generate wealth and wealth gives the power.
- Periodic reorganization of political forces due to technology
- Technology occasionally becoming a political asset

iv) **Education**
- Technology development processes started because of education.
- Easier methods of learning , e.g. audio visual aids
- Easy distribution of information distribution
- Technology has made education essential to earn living.
  - Models of education
    - Classical model : history, literatures, philosophy, language, focus on past achievements
    - Religious model : focus on holy books of religion
    - Managerial model : focus on vocational education
    - Humanistic model : making the people more human, focus on arts and science

v) **Religion**
- Technology helps to unmask old social problems.
- For a large number of people in modern societies, religion is neither good nor bad but simply irrelevant, given the many alternative ways to find meaning in various forms of cultural pursuits, ethical ideals, and lifestyles.
- The technology has changed the spiritual beliefs to the business opportunities.

vi) **Technology has created new opportunities in the society**
- It is seen to be motor of all progress as holding the solution to most of our social problems,
- As helping to liberate the individual from the clutches of a highly organized society
- As the source of permanent prosperity.
- In short as a promise of utopia of our time.

This view has its modern origins in the social philosophies of such 19th century thinkers as *Saint Simon, Karl Marx and Auguste Kumte.* It tends to be held by many scientist and engineers and many military leaders, aerospace industrialists, by people who believe that man is fully in command of his tools and his destiny, and many of the devotees of modem techniques of scientific management.

1.2.2 Benefits of society from new technological innovation

There are a number of areas where the new technological innovations has resulted a lot of benefit to the society. *For example;*

- Aerospace technology : It facilitates the communication system through satellites construction works under the water. India-Oman Gas

pipeline project is envisaged based on the concept of Aerospace Technology.

- Information technology : It is needless to say how the information technology has revolutionaries the world. The world has become a global village.
- Mass communications : Mass commuters has enabled majority of the people to wander around.
- Automobiles
- Biomedical technologies : It has facilitated for the medical diagnosis.
- Agricultural technology : It has helped increase the production and productivity.
- Information and communication system

Science is certainly a significant contributor to economic growth, but that narrow view ignores much of what research can accomplish. We need to think of ways to link scientific research more closely to the societal results that we want to achieve.

Two standard assumptions from the past are far too simple to be productive guides to today's complex science policy: those socially optimal outcomes will result from the amalgamation of the results of individual scientific projects, and that science always benefits humanity.

In particular, knowledge and innovation that drive up health-care costs can lead to reduced access to health care by poor people.

Consider, as an example, the science of crop genetics. Our quest for expanded yields, year-round products, reduced parishes ability, and other improvements have resulted in the development of genetically modified organisms.

We will need better ways to assess the social and economic impacts of scientific discoveries. Science and its power continue to advance, yet our ability to harness that power for maximum social benefit remains stagnant. That mismatch means that the societal costs of our current approach to science policy are likely to grow in the future. Policies that focus on social outcomes are a key pan of the solution.

1.2.3 Impacts of computer on society

Everyone knows that this is the age of computer and vast majority of people are using computer. Development of science and technology has direct effect on our daily life as well as in our social life. Computer technology has made communication possible from one part of the world to the other in seconds. They can see the transactions in one part of the world while staying in the other part. Computer development is one of

the greatest scientific achievements of the 20th century. Computers are used in various fields as well as in teaching and learning. Some of the major computer application fields are listed below.

i) **An aid to management** : The computer can also be used as a management tool to assist in solving business problems.

ii) **Banking** : Branches are equipped with terminals giving them an online accounting facility and enabling them to information as such things as current balances, deposits, overdrafts and interest charges.

iii) **Industrial application** : In industry, production may be planned, co-ordinated and controlled with the aid of a computer.

iv) **Engineering design** : Computer help in calculating that all the parts of a proposed design are satisfactory and also assist in the designing.

v) **Meteorology** : Data is recorded at different levels of atmosphere at different places, using remote sensors carried on a satellite.

vi) **Air travel** : Small computers are installed as a part of the plane's equipment.

vii) **Road traffic control** : Computers assist with the control of traffic lights.

viii) **Telephones** : Computerized telephone exchanges handle an ever increasing volume of calls very efficiently.

ix) **Medicine** : Computers are widely used in hospitals for such task as maintaining drugs, surgical equipment's and linen, for payroll and also for checkup and treatment of diseases.

In addition computers are also used for recording and film studios, research, military, etc.

Computers have both positive and negative impact in our daily life as well as in our social life. But the gross development of the nation is faster with the application of computers in industries and education. The both positive and negative impacts of computers are listed below.

Positive impact of computer

- The work can be done in very less time.
- More information can be stored in small space.
- Multitasking and multiprocessing capabilities of data.

- Easy to access data.
- Impartiality.
- Documents can be kept secret.
- Error free result.
- It can be used for various purposes. *i.e.*, it can be used in any type of work.

Negative Impact of computer

- Highly expensive.
- Accidents.
- Data piracy.
- Increased Unemployment.
- Huge data and information can be lost sometimes.
- Fast changing computer technology.
- Service distribution.

1.3 HISTORY OF ENGINEERING PRACTICE IN EASTERN SOCIETY

Engineering practices in eastern societies can be with significant events as follows:

- During 5000 B.C., civilization developed near Yanshao, where people roamed seeking new soil for animals and agriculture. People used earthen pottery and stone tools.
- During 4000 B.C., early Chinese communities planned cities according to Grid pattern with intersecting streets at right angles to each other.
- During 3300–3200 B.C., Egyptians first developed a system of Division of Labor on closed societies in Sumar and Egypt, particularly among merchants and metal workers.
- During 3500–3000 B.C., in Sumeria, the appearance of towns and cities coincide with the production and distribution of goods through trades.
- In 132 A.D., Chinese philosopher Chang Heng invented a Seismoscope.
- In 510 A.D., China's Grand Canal (Shan-Yang) in southern China was built connecting Yangtze (Chang-Jiang) and Huang-He (yellow river), which played a lifeline for north China providing a transportation route for grains and commodities.
- During 704 A.D., the Buddhist text "Dharani Sutra" was printed in Korea during 704–751 A.D., using block-printing technique. It is the oldest existing printed book.
- In 805 A.D., the forerunners of Gun were invented, which is called 'fire lance', early models consisting of Roman Candles tied two spears, resembling flame throwers.

- In 1040 A.D., Chinese writer Tseng Kung-Liang published the first known Gun-powder formula for use in three weapons- (a) Bomb held by a king of catapult, (b) Bomb with hooks and (c) Poison smoke ball.
- In 1045-1048 A.D., Pi-Sang invented movable type of printing. Printing with movable type was developed in Europe in mid-15th century.
- In 1250 A.D., true guns with a gun powder chamber and strengthening explosion chamber to prevent splitting appeared in China. In less than a century, guns reached in Europe and changed to characters of medieval warfare.
- In 1805 A.D., Habaoka Seishu performed the first Surgery under a general anesthesia in Japan.
- The Iranians built many bridges, however of which some survive from the time of Shapur-I (300 A.D.).
- In 400 A.D., the Sassaid kings built a great palace at Ctesiphon, which was a capital on Tigris, north east of deserted Babylon and downstream from the village of Baghdad. Part of this palace still stands, including most of the vaulted dining hall-"the widest single span vault of unreinforced brick work in the world." The vault is 77 feet wide at the base and 112 feet high.
- In 515 B.C., Persian building method with stone instead of wood introduced in to India when Darius conquered the Punjab.

1.4 HISTORY OF ENGINEERING PRACTICE IN WESTERN SOCIETY

Engineering practices in western societies can be traced out with significant events as follows:

- In 3000–1000 B.C., Stonehenge-a monument consisting of concentric circles of stone oriented towards the Sun position on the summer solstice in England.
- In 300–100 A.D., agriculture and power appeared in ancient Mesoamerica.
- In 250–900 A.D., Maya created and maintained a sophisticated pair of interlocking calendar to help them plan ceremonies.
- In 1268 A.D., English scientist and philosopher Roger Banon records a statement about using lenses to improve vision with eyeglasses. At the end of 13th century, many wealthy and elite people in Europe, Asia, and Africa wear glasses.
- In 1487 A.D. Aztec ruler Ahuizotl dedicated the new Tempo Mayor (great temple), an enormous double pyramid in Tenochtitlan to the warrior God of the Sun.
- In 1673 A.D., English Mathematician, John Hadlley and American inventor Thomas Godfery independently invented the Sextant, an

- optical instrument to measure angular distance between any two objects.
- In 1747–1752 A.D., American Scientist Benjamin Franklin theorized that lightning is a form of electricity.
- In 1780 A.D., Scottist inventor James Watt and English manufacturer Matthew Boulton began manufacturing a steam engine for individual use.
- In 1793 A.D., American Eli Whitney invented the cotton gin, a device that rapidly and effectively removes the seeds from cotton fiber.
- In 1807 A.D., American inventor and engineer Robert Fulton inaugurated a new era of power driven navigation as a steamboat.
- In 1660 A.D., a fine opportunity for planned city was offered after a great fire of London by John Evelyn, the diarist and civil servant and Christopher Wren, an architect to Charles II for rebuilding the burnt city before the ashes cool down.
- In 1548–1620, Simon Stevin discovered the triangle of forces in Netherlands, which helped to calculate the actual load on the members of cranes, trusses and other structures.
- Stevin's younger contemporary Galileo Galilei in 1564–.1642 A.D., solved the problem of accelerated movement and began the analysis of stresses in beams.
- Technical men organized the society of Lynxes to which Galileo belonged. The first research institute was founded in 1560 A.D..
- Engineering school appeared in France in 1800 A.D. and at the same time specialization within engineering profession took place. John Smeaton, who went to France in 1750's A.D. to round off his technical education, called himself 'Civil engineer' meaning non-military engineer.

1.5 ENGINEERING PRACTICE IN NEPAL

History of engineering education dates back to vedic period. Different literatures, such as; Vastushastra, Vastupuran, Vasturatnakar, Vastusar, Vastumandan, Mayamatam, Manashar, Matsyapuran, Mahabharat, Prashadmandan, Shukraniti, Brihatsamhita etc. have shaded light in different dimension of engineering knowledge and skills. The Takshashila, Nalanda and other universities of the early periods were some eminent institutions delivering formal engineering education. In the historical period, there was more informal technical education, transferring technology from generation to generation through experiences. The great legend Balabahu (Araniko) was the architect of the 13th century, well-known for establishing new history of pagoda architecture in China. Vocational education was very much popular in Kathmandu valley during Malla period as a tool to increase revenue.

There was a special degree for citizens to learn some kind of skills and involve in production and business. Malla period was famous for handicraft. It was the golden period for all types of architectures. The kings from parts other than valley were also found to be cautious on the importance of technical works. During Rana dynasty (1846–1950) Mr. Bir Shamsher was found to be aware of the technical education for the development of the country. As a result of this, his son, Gehendra Shamsher, along with other 5 students were sent to Japan for higher engineering study. They were the pioneer engineers taking formal engineering degree in modern engineering education in Nepal.

Formal technical education started in 1930 (1987/11/19 B.S.) after the establishment of technical school in Kumari Chowk, Kathmandu. At the beginning, this school began the trade course on textile skill. In 1942 (1998/10/17 B.S.), engineering section was introduced in the school offering two years sub-overseer course for SLC graduates. This school was shifted to Tri-chandra campus in 1945 and renamed as engineering school in 1950. It was in 1958 that this school was accepted as a formal institution to deliver engineering education and once again renamed as Nepal Engineering Institute and it was shifted to Nepal Administrative Training Council complex, Jawalakhel at the beginning of 1958. By the end of same year 1958, it was taken to Ananda Niketan, Pulchowk. It offered overseer course in civil engineering and later on in 1971 offered electrical overseer course. In 1963, technical training institute was established in Thapathali under the assistance of German Government offering overseer course in mechanical and electrical engineering.

After the introduction of new education system plan in 1972 in the country, institute of engineering (IOE) was formed under Tribhuvan University and both the Nepal Engineering Institute and technical training institute were brought under institute of engineering. Nepal Engineering Institute was renamed as Pulchowk Campus and Technical Training Institute was renamed as Thapathali Campus. Followed by the government policy of expanding engineering education, Purwanchal campus was established in 1977 at Dharan in the eastern part of the country under the financial assistance of Asian Development Bank (A.D.B). The academic programs were began from 1984 with the technical assistance of overseas development assistance (ODA), an organ of British government. Initially, trade courses and proficiency level courses in various engineering areas were offered in the campus. Similarly, Paschimanchal Campus was established in 1981 at Pokhara in the western region of Nepal under the financial assistance of World Bank and technical assistance of UNDP/ILO. This campus was brought into operation from 1987. Initially, various trades and technician courses were offered at this campus. Institute of engineering begin bachelor courses in engineering from 1978, master coursed from 1996 and doctoral program from 2003.

1.6 KEY ROLES OF ENGINEERING IN THE DEVELOPMENTAL ACTIVITIES

History tells us that engineers are the people who exploit the properties of matters and sources of power for the benefits of the mankind. From this it is known that this roles played from ancient time by engineers are innovating the properties of matters, utilize them for the benefits of the people, and preserve the same for longer use. Similarly they seek sources of power so that power can be used in the welfare of people. Therefore, the major roles played by engineers in developmental activities are:

i) **Creating vision** : Imagine a useful and beneficial object are product that can be produced by utilizing the properties of different matters and sources of power for the benefits of the people.

ii) **Preparing mission** : Plan, prepare and produce the same economically for the use of larger number of people for safe, healthy and protection.

iii) **Execution** : Assign the planned activities and or get assigned the jobs that require engineering skills and knowledge for implementation.

iv) **Monitor and evaluate** : Monitor and evaluate and supervise the make for accuracy, timely, quality and economical products.

v) **Train** : Train new engineers practically, technically and professionally to make professionals.

vi) **Upgrade profession** : Innovate, systematize and produce or make facilities for the people by keeping up the dignity and ethical values of engineers.

With these basic roles of engineers in development activities, the impact left over in societies is changed societies. We can notice those impacts in the societies that the people utilizing them and make their lives more and better comfort ever then before. The changes brought by the engineers.

1.7 EXAM SOLUTION

1. **What are the difference between community and society? Briefly describe the theories of social change.** [2069 Bhadra; W: 2+3]

Ans: See the definition part 1.1.4 and 1.1.5.2

2. **Why is society necessary for engineers? What are the roles that an engineer can play in the society?** [2070 Bhadra; W: 5]

Ans: See the definition part 1.2 and 1.6

3. **Discuss on the impact of technology into the society.** [2071 Bhadra; W: 4]

Ans: See the definition part 1.2.1

4. **Discuss about engineering practice of Nepal.** [2071 Bhadra; W: 4]

Ans: See the definition part 1.5

5. **Define society? What are the fundamental social needs to be addressed for the survival of every type of societies?** [2071 Magh; W: 4]

Ans: See the definition part 1.1.1 and 1.1.6

6. **What is social change? What are the factors causing social change? Describe the role of technology in social change.** [2072 Ashwin; W: 8]

Ans: See the definition part 1.1.5.1

7. **Define society. Illustrate elements of society. Describe the relationship between man and society.** [2072 Magh; W: 8]

Ans: See the definition part 1.1, 1.1.1 and 1.1.2

8. **What are the major activities to be governed by the society for its survival? Illustrate the impacts of computer on Nepalese society.** [2073 Bhadra; W: 4]

Ans: See the definition part 1.1.6 and 1.2.3

9. **Why are men and societies so important to engineering profession?** [2073 Magh; W: 4]

Ans: See the definition part 1.1 and 1.6

10. **Write short notes on: Technology and Society** [2073 Magh; W: 4]

Ans: See the definition part 1.2

11. **Write down in brief the characteristics features of society. What are the elements of community?** [2074 Bhadra; W: 5]

Ans: See the definition part 1.1.2 and 1.1.4

12. Explain criteria of society? [2074 Magh, W: 4]

Ans: See the definition part 1.1.2 (Characteristics of society)

13. Explain what type of social change theory is suitable for your society. [2075 Bhadra, W: 4]

Ans: See the definition part 1.1.5.2 (v) (Technological theory)

14. How are a man and the society related? What are the elements of community? [2075 Magh, W: 4]

Ans: **For the first part**

See the definition part 1.1

For the second part

See the definition part 1.1.4.

15. Why is society necessary to a man, or to an engineer? Explain. [2076 Bhadra, W: 4]

Ans: See the definition part 1.1

16. Why is society important to the engineering profession? Explain briefly the history of engineering practice in Nepal. [2077 Chaitra; W: 2+2]

Ans: **For the first part**

Society plays a crucial role in the engineering profession. Engineering projects have a direct impact on the well-being of society and therefore, engineers have a responsibility to ensure that their work benefits and does not harm the community. This requires engineers to understand and consider social and ethical issues when designing and implementing projects. Furthermore, engineer's work must be socially acceptable and comply with laws, regulations, and standards. Society also presents engineering with many challenges, such as climate change, resource depletion, and infrastructure development, and engineers have a crucial role to play in addressing these problems. In turn, the engineering profession is reliant on a supportive and well-informed society to provide funding and support for projects, as well as to provide a market for the products and services produced by engineers.

For the second part

See the definition part 1.5

17. Explain why society is important for engineers? What are the key roles that an engineer plays in a society? [2078 Chaitra; W: 4]

Ans: **For the first part**

See the solution of Q. no. 16

For the second part

See the definition part 1.6

Chapter 2

PROFESSION AND ETHICS

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2.1 PROFESSION: DEFINITION AND CHARACTERISTICS

A profession is defined as having a systematic knowledge acquired through specialized training or education and practicing the same as an occupation.

- Synonym to job or occupation.
- Besides these, professionals bear morals and ethical behaviors.
- The content of profession with moral and ethical behaviors is professionalism.

2.1.1 Characteristics of Profession

The fundamental characteristics of the profession are as follows:

i) Great responsibility

Professionals deal in matters of vital importance to their clients and are therefore entrusted with grave responsibilities and obligations. Given these inherent obligations, professional work typically involves circumstances where carelessness, inadequate skill, or breach of ethics would be significantly damaging to the client and/or his fortunes.

ii) Accountability

Professionals hold themselves ultimately accountable for the quality of their work with the client. The profession may or may not have mechanisms in place to reinforce and ensure adherence to this principle among its members. If not, the individual professional will (*For example;* guarantees and/or contractual provisions).

iii) Based on specialized, theoretical knowledge

Professionals render specialized services based on theory, knowledge, and skills that are most often peculiar to their profession and generally beyond the understanding and/or capability of those outside of the profession. Sometimes, this specialization will extend to access to the tools and technologies used in the profession (*For example;* medical equipment).

iv) Institutional preparation

Professions typically require a significant period of hands-on, practical experience in the protected company of senior members before aspirants are recognized as professionals. After this provisional period, ongoing education toward professional development is compulsory. A profession may or may not require formal credentials and/or other standards for admission.

v) Autonomy

Professionals have control over and, correspondingly, ultimate responsibility for their own work. Professionals tend to define the terms, processes, and conditions of work to be performed for clients (either directly or as preconditions for their ongoing agency employment).

vi) Clients rather than customers

Members of a profession exercise discrimination in choosing clients rather than simply accepting any interested party as a customer (as merchants do).

vii) Direct working relationships

Professionals habitually work directly with their clients rather than through intermediaries or proxies.

viii) Ethical constraints

Due to the other characteristics on this list, there is a clear requirement for ethical constraints in the professions. Professionals are bound to a code of conduct or ethics specific to the distinct profession (and sometimes the individual). Professionals also aspire toward a general body of core values, which are centered upon an uncompromising and unconflicted regard for the client's benefit and best interests.

ix) Merit-based

In a profession, members achieve employment and success based on merit and corresponding voluntary relationships rather than on corrupted ideals such as social principle, mandated support, or extortion (*For example;* union members are not professionals). Therefore, a professional is one who must attract clients and profits due to the merits of his work. In the absence of this characteristic, issues of responsibility, accountability, and ethical constraints become irrelevant, negating any otherwise-professional characteristics.

x) Capitalist morality

The responsibilities inherent to the practice of a profession are impossible to rationally maintain without a moral foundation that flows from a recognition of the singular right of the individual to his own life, along with all of its inherent and potential sovereign value; a concept that only capitalism recognizes, upholds and protects.

2.1.2 Factors affecting morale of professionals

i) Today, professions are found loosing professionalism due to following cause:
ii) Inadequate salary.
iii) Defective social norms or value.
iv) Low morale of the individual.
v) Non-regularities of law and regulations.
vi) Lack of political commitment

2.2 PROFESSIONAL INSTITUTIONS

2.2.1 Professional Engineering Body

- It is an independent body that regulates the practice of professional engineering.
- It governs its members in accordance with the statute of the body and rules, regulation and by laws of the country in order to serve and protect the public interest
- NEA, SONA, SCAEF etc. are few examples of professional body.

2.2.2 Principal Objective of Professional Body/Associations

In general, the purpose of the professional association should be to regulate the practice of professional engineering and to govern its

member, holders of certificate of authorization, holders of temporary licenses and holders of limited licenses in accordance with the act of the country or provinces in order that the public interest can be served and protected. Following are the principle objectives of professional body/associations:

- Center of learning (library, professional network, universities, school zones).
- Professional membership (providing professional status).
- Voice of profession (consultation with government, media interaction)
- Facilitator of best practice (providing training and recruitment.
- To establish, maintain and develop standards of knowledge and skill among its member.
- To establish, maintain and develop standards of qualification and standard of practice for the practice of professional engineering.
- To establish, maintain and develop standards of professional ethics among its member.
- To promote public awareness of the role of association.
- To perform other duties and exercise for other powers as are imposed or conferred on the association by or under any act.

Role of professional body/associations

Following are the role of professional body or associations:

- Regulation of the practice of the profession.
- Licensing.
- Guidance for training new entrants into the profession.
- Set norms and standards.
- To grant permission / approval.
- Monitoring.
- Advice, assistance and monitoring to engineering colleges.
- To upgrading and monitoring the professional and technical competence of member.
- Providing technical expertise as requested for the guidance and assistance of legislators.
- Seeing to the matter of safety and general welfare of the public in engineering works.

General requirements for membership

Following are the general requirements for the member of professional body or associations:

- Citizenship (nationality)
- Academic qualifications
- Experience
- Character certificate
- Knowledge of law and ethics
- Language and competence

2.2.3 Examples of Engineering Professional Body/Associations

Following are some engineering professional body/associations.

2.2.3.1 Nepal Engineering Council (NEC)

Background

It can be said that Nepal entered a modern phase in engineering after the political change in the sixties. Engineering activities began to contribute to the development of the country and the engineering profession started to gain respect in the society. The engineering community began to grow in number and was involved in all spheres of national development and engineers were allowed to compete in administrative service also for the post of secretary. Furthermore, the introduction of democracy in 1990 encouraged the growth of engineering colleges in Nepal and the enrolment of students into these engineering colleges was rising very fast. Hence it was expected that nearly 3000 engineers would be graduating from local engineering colleges every year with nearly an equal amount graduating from colleges abroad. So, a need was felt for an organization to manage the engineering profession. Therefore, to make the engineering profession more effective, Nepal Engineering Council was formed under the Nepal Engineering Council Act, 2055 promulgated by His Majesty the King on B.S. 2055/11/27 (11th March, 1999 A.D.). As per the Act; NEC has been vested with the statutory authority for the planning, coordinated development and monitoring of engineering profession and education in the country. NEC Act 2055 gives an outline on the formation of the Council, its tenure and the roles and responsibilities of the Chairman, Vice Chairman and the Registrar.

Nepal Engineering Council Rules, 2057 has also been prepared and approved by His Majesty's Government as per the provision of Clause 37 of the Act. It defines the registration of engineers into three categories as well as the formats for application:

i) General registered engineer–Category: A
ii) Professional engineer–Category: B
iii) Non–Nepali registered engineer–Category: C

NEC Rules 2057 also lays down the professional code of conduct for engineers registered with the Council. The first Executive Council was formed on Magh 2056 under the chairmanship of Er. Ram Babu Sharma and completed its tenure on Magh 2060.

Objectives of Nepal Engineering Council (NEC)

The objective of Nepal Engineering Council is to make the engineering profession effective by mobilizing it in a more systematic and scientific and also to register the engineers as per their qualifications. Its duties and responsibilities are:

member, holders of certificate of authorization, holders of temporary licenses and holders of limited licenses in accordance with the act of the country or provinces in order that the public interest can be served and protected. Following are the principle objectives of professional body/associations:

- Center of learning (library, professional network, universities, school zones).
- Professional membership (providing professional status).
- Voice of profession (consultation with government, media interaction)
- Facilitator of best practice (providing training and recruitment.
- To establish, maintain and develop standards of knowledge and skill among its member.
- To establish, maintain and develop standards of qualification and standard of practice for the practice of professional engineering.
- To establish, maintain and develop standards of professional ethics among its member.
- To promote public awareness of the role of association.
- To perform other duties and exercise for other powers as are imposed or conferred on the association by or under any act.

Role of professional body/associations

Following are the role of professional body or associations:

- Regulation of the practice of the profession.
- Licensing.
- Guidance for training new entrants into the profession.
- Set norms and standards.
- To grant permission / approval.
- Monitoring.
- Advice, assistance and monitoring to engineering colleges.
- To upgrading and monitoring the professional and technical competence of member.
- Providing technical expertise as requested for the guidance and assistance of legislators.
- Seeing to the matter of safety and general welfare of the public in engineering works.

General requirements for membership

Following are the general requirements for the member of professional body or associations:

- Citizenship (nationality)
- Academic qualifications
- Experience
- Character certificate
- Knowledge of law and ethics
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Objectives of Nepal Engineering Council (NEC)

The objective of Nepal Engineering Council is to make the engineering profession effective by mobilizing it in a more systematic and scientific and also to register the engineers as per their qualifications. Its duties and responsibilities are:

i) To prepare policies, plans and programs for the smooth functioning of the engineering profession and to execute them.
ii) To set norms and standards for engineering education in Nepal.
iii) To grant permission and approval to carry out engineering education to those engineering colleges and institutions that meet the required norms and standards and to honor their degrees and certificates.
iv) To monitor and inspect the quality of engineering education provided by the engineering colleges and institutions.
v) To fix the qualification necessary in order to practice engineering profession and to register their name in the Council.
vi) To remove their name from the registration of the engineering council if found to violate the code of ethics.

Jurisdiction of Nepal Engineering Council (NEC)

Following are the jurisdiction of NEC:

- Registration of engineers
- Accreditation of certificates of academic qualifications
- Recanalization of academic institutes
- Professional code of conduct

Professional code of conduct-Nepal Engineering Council (NEC)

The professional Code of Conduct to be followed by the registered Engineers of the Council, subject to the provision of the Nepal Engineering Council (NEC) Act, 2055 (1998) and the Nepal Engineering Council Regulation, 2057(2000), has been published as follows:

i) Discipline and honesty

The Engineering service/profession must be conducted in a disciplined manner with honesty, not contravening professional dignity and well-being.

ii) Politeness and confidentiality

Engineering services for customers should be dealt with in a polite manner and professional information should remain confidential except with written or verbal consent of the customers concerned. This, however, is not deemed to be a restriction to provide such information to the concerned authority as per the existing laws.

iii) Non-discrimination

No discrimination should be made against customers on the grounds of religion, race, sex, caste or any other things while applying professional knowledge and skills.

iv) Professional work

Individuals should only do professional work in their field or provide recommendations or suggestions only within the area of their subject of study or obtained knowledge or skills. With regard to the works not falling within the subject of one's profession, such works should be recommended to be done by an expert of that subject matter.

v) Deeds which may cause harm to the engineering profession

With the exception of salary, allowance and benefits to be received for services provided, one shall not obtain improper financial gain of any kind or conduct improper activities of any kind, which would impair the engineering profession.

vi) Personal responsibility

All individuals will be personally responsible for all works performed in connection with his/her engineering profession.

vii) State name, designation and registration number

While signing the documents or descriptions such as the design, map, specifications and estimates etc., relating to the engineering profession, the details should include the name, designation and NEC registration number and should be stated in a clear and comprehensible manner.

viii) No publicity or advertisement must be made which may cause unnecessary effect

In connection with the professional activities to be carried out, no publicity or advertisement shall be made so as to cause unnecessary effect upon the customers.

2.2.3.2 Nepal Engineering Associations (NEA)

Background

Nepal Engineers' Association (NEA) is an independent nonprofit organization of Nepalese engineers, registered under the Social Service Act of the Government of Nepal. It was established in 1962. Today, it represents 19792 engineers, belonging to various engineering disciplines including architects, civil, electrical, mechanical, electronics etc. and coming from both the public and private sector economies. NEA is governed by an elected executive council of 15 members, led by the President of the association for tenure of two years. NEA's mandates include promoting fellowship goodwill and cooperation assistance among the Nepalese engineers, safeguarding their rights and interests and promoting development of science and technology. Lately NEA has established centers for Continuous Engineering Education (NEA CCEE) and the Business Incubation Center (NEA BIC) to address respectively the CPD requirements for professional enhancements and to promote entrepreneurship capabilities among the young engineers facilitates and coordinates the professional activities of the independent subject specific professional societies namely that of Agricultural Engineers (NSAE), Architects (SONA), Arbitrators (NEPA), Computer Engineers (ACEN), Electrical and Communication Engineers (SECEN), Electrical Engineers (SEEN), Irrigation Engineers (SIREN), Mechanical Engineers (SOMEN),

Public Health Engineers (SOPHEN), Structural Engineers (SEANep), Technical Auditors (SOTAN), Regional and Urban Planners (RUPSON), Rural Development Engineers (SERDEN), Value Engineers (NVA) and Society of Consulting Engineers and Architectural Firms (SCAEF).

In the aftermath of the disastrous 7.8 magnitude earthquake of April 25, 2015, NEA had been instrumental in massive mobilization of around 3,500 engineers to conduct Rapid Visual damage Assessment of more than 65,000 affected buildings free of cost. Through partnership with Government of Nepal, UNDP and other academic institutions and professional societies, the NEA CCEE has been contributing towards enhancing the professional skills of engineers for undertaking post seismic assessment, repair and strengthening of damaged buildings. NEA is also engaged in supporting the reconstruction efforts by engaging in mason training on earthquake resistant construction and design competition for suitable model housing designs.

Objectives of Nepal Engineering Associations (NEA)

Following are the objectives of NEA:

i) To promote development of the engineering science and technology in Nepal.
ii) To promote fellowship goodwill and cooperation assistance among the Nepalese engineers and safeguard their rights and interests.
iii) By utilizing, to the highest extent possible, the participation of the national engineering manpower of the country in the national development activities of Nepal, make effort towards ending foreign dependency in this regard.
iv) To continuously enhance the highest professional ideals among the members and widen it.
v) To develop relations, fellowship and goodwill with international engineering associations and institutions.

2.2.3.3 Society of Nepalese Architects (SONA)

Background

Society of Nepalese Architects (SONA) is the professional organization of Nepalese Architects, established in 1991 by a group of enthusiastic architects who represented government, private sector and academia. The main objective of SONA is to protect the rights and responsibilities of Nepalese architects and promote architectural profession in Nepal. SONA has grown over a period of 25 years from a small group of architects concentrated in Kathmandu Valley, to a nationwide organization with a total membership of more than 800. SONA has been registered as a professional organization in the District Administration Office Kathmandu and abide by government rules and regulations strictly. SONA has established its own office space at the Churchill Complex Sundhara Kathmandu in 2011, supported by full-time staff for day-to-day administration works. As per the statute of SONA, the Executive Committee with 11 members is elected for a period of two years. There are nine thematic committees headed by prominent architects of Nepal. The committees are responsible for organizing events like seminars, workshops and discussion programs, generating opinions on emerging issues and advising the government and nongovernment agencies.

Objectives society of Nepalese architects (SONA)

Following are the objectives of SONA:

i) To promote development of architecture and its related art, science and technology throughout Nepal.
ii) To promote the companionship, kindness and support within the architects and to safeguard their professional rights and interests.
iii) By utilizing, to the highest extent possible, the participation of the national architects' manpower of the country in the national development activities of Nepal.
iv) To continuously enhance the highest professional ideals among the members and widen it.
v) To develop relations, fellowship and goodwill with international architect's associations and institutions.

2.2.3.4 Federation of Contractor Associations of Nepal (FCAN)

Contractors of Nepal who are relatively established today started their profession with their own effort without any help, guidance or training was trying to establish their representative organization before two decades or more. It was very difficult to establish such association during the party-less political system (1960-1990). This sector is contributing around 11 percent to the Gross Domestic Product (GDP) of the country after the agriculture, the second largest employer of the country that provides employment opportunity not only to the unemployed but also to the underemployed and to the seasonal workers. Similarly, about 60 percent of the nation's development budget is spent through this season. In spite of this, the effort from the government side to this sector was very limited only to extend of classifying the contractors to different classes and renewing their licenses annually.

2.3 RELATION OF AN ENGINEER WITH CLIENT, CONTRACTOR AND FELLOW ENGINEERS

Engineer's relationship with client

- Strict professional relationship, even if the client is closely familiar (relative, friend).
- No discrimination among client based on culture, race, religion, sex etc.
- Work in the best interest of the client with loyalty with legal limit.

- Deliver in time, with quality.
- Not expect extra favour for works performed as per an agreement.
- "An engineer shall not accept financial or other compensation from more than one party for services rendered on one project unless the details are fully disclosed and agreed by all parties."
- Supervise work and prevent misuse/abuse of client's property/trust.
- Assist in decision making by providing options.
- Warn potential risks of decisions.
- Going beyond ToR, when professionally required.
- Keep information confident, unless required by law.
- Full disclosure of potential conflict of interest, if any.
- Not take a client for granted: remembrance of bad experience lingers much longer than a good experience.

Engineer's relationship with Contractor

- Strict professional relationship, even if the contractor is close familiar (relative, friend).
- Provide due respect to the contractor.
- No discrimination among contractors based on belief, race religion, culture, sex, sexual orientation etc.
- Provide all the detailed drawings, quantity and quality (including specification) of works (goods and services) to the contractor in time.
- Check and approve running bills in time, as per specification
- Not expect or accept (directly or indirectly) extra favour of significant value, for works performed as per an agreement.
- Supervise work and prevent use of sub-standard methods and materials being used.
- Participate in co-decision making by providing options when necessary.
- Assist the contractor when variations are technically needed.
- Warn potential risks of decisions/actions.
- Going beyond ToR, when professionally required.

Engineer's relationship with fellow Engineers

- Professional relationship with all the engineers, regardless of their status, and even if the fellow engineer is a close relative.
- "Engineers shall not attempt to injure, maliciously or falsely, directly or indirectly, the professional reputations, prospects, practice or employment of other engineers, nor indiscriminately criticize the work of other engineers."
- Criticize cautiously and objectively with respect to the person's professional status.
- Have professional relationship:

- Encourage fellow engineers to follow Code of Ethics.
- Guide, train and orient freshly graduate engineers.
- Create platform for information and knowledge sharing.
- Support fellow engineers in professional development.

2.4 ETHICS, CODE OF ETHICS AND ENGINEERING ETHICS

2.4.1 Ethics

Its simplest, ethics is a system of moral principles. They affect how people make decisions and lead their lives. Ethics is concerned with what is good for individuals and society and is also described as moral philosophy. The term is derived from the Greek word ethos which can mean custom, habit, character or disposition. Ethics covers the following dilemmas:

- how to live a good life.
- our rights and responsibilities.
- the language of right and wrong.
- moral decisions–what is good and bad?

Our concepts of ethics have been derived from religions, philosophies and cultures. They infuse debates on topics like abortion, human rights and professional conduct.

Approaches to ethics

Philosophers nowadays tend to divide ethical theories into three areas: metaethics, normative ethics and applied ethics.

- Meta-ethics deals with the nature of moral judgement. It looks at the origins and meaning of ethical principles.
- Normative ethics is concerned with the content of moral judgements and the criteria for what is right or wrong.
- Applied ethics looks at controversial topics like war, animal rights and capital punishment

2.4.2 Engineering morals, ethics and professionalism

Morals measure the standard of good behavior by which people are judged. Engineering morals mean the standard of good behavior of engineering people by which they are judged. In moral quality, Tightness or wrong are present. Non-moral means devoid of moral quality. All actions are non-objects of moral judgment. Only voluntary and rational people are the objects of moral judgments. The actions like nature or animals are not moral actions, even if the actions are good for human, because they are devoid of response to human life. Therefore, it should be human behavior concern for moral actions.

Ethics is a system of belief that supports the view of morality. Morality concerns with the principle of what is good and bad, right or wrong behaviors. Engineering morals measure the standard of good behaviors of engineers. As engineering people are the people to work for the benefits

of mankind by exploiting the properties of matter and sources of power they can come across moral dilemma in various stages of works. The interest and will of the people in the society may differ mainly because of seeking more benefits or return on behalf of them alone. They start then influencing the engineering people and the conscience of engineers' come across moral dilemmas. The engineers need to overcome the dilemma considering various laws of ethics as described under:

i) Eternal law of ethics

The external law of moral is the set of standards of goods behaviors based on the nature and the scriptures. Studying the nature and scriptures common sets of moral standards are set. The set of morals standards should be obvious to anyone who takes time to study the nature of scriptures. Everyone should act in accordance with the common set of standards. These laws are general rules or principles. "Do onto others as you would have others do onto you" is an example.

ii) Utilitarian law of ethics

The professional or individuals should act in the way to creating the greatest benefits for the largest numbers of people. It based upon the outcomes or results of the act. This law of ethics arose from the teleology theory. In Greek, 'teleo' means outcome or result. So, a person should be aware of his or her act for its results or outcomes.

iii) Universalism law of ethics

This law of ethics is based upon the motive or intent of the doers. It states that the professionals must have good motives behind their doings. This law comes from 'Deontological theory', wherein 'Doen' in Greek means duties and obligations. A professional as an engineer, have duties and obligations towards the societies they live in.

iv) Distributive justice law of ethics

This law is based upon the primacy of justice equal to all. Rules and laws apply to all people. The professionals must have back in the mind that the law applies equally to all. The outgrowth ofequality today is the result of this law.

v) Personal liberty law of ethics

This law of ethics is based upon the primacy of personal liberty. This law states that any act that violates anybody's personal liberty even if the act creates greater benefits for the larger number of people is not accepted. Any action of professional or individual must not violate anybody's liberty at all.

2.4.3 Code of Ethics

The ethics as normative science of any professional conduct needs Code of ethics and guidelines to maintain high level of standards of good behavior or conduct in the public. Engineers create facilities and services by any or all of the acts- designing, composing, evaluating, advising,

reporting, directing, and supervising wherein the safeguard of life, health and property or the public welfare is concerned. Engineers do so by applying engineering principles and the experiences gained. The National Society of Professional Engineers (NSPE), U.S. approved by the Board of Directors on 5th Oct. 1977 has set the fundamental principles for engineers to uphold and advance the integrity, honor and dignity of engineering profession by:

i) Using their knowledge and skill for the advancement of human welfare.
ii) Being honest and impartial and serving with fidelity the public, their employers and clients.
iii) Striving to increase the competencies and prestige of engineering profession.
iv) Supporting the professional and technical societies of their discipline.

The fundamental canons for the professional engineers are as follows:

i) Engineers should hold paramount the safety, health and welfare of the public in the performance of their professional duties.
ii) Engineers shall perform services only in the areas of their competencies.
iii) Engineers shall issue public statements only in an objective and truthful manner.
iv) Engineers shall act in professional matters for each employer or client as faithful agents or trustees and shall avoid conflicts of interest.
v) Engineers shall build their professional reputations on the merit of their services and shall not complete unfairly with others.
vi) Engineers shall act in such manner as to uphold and enhance the honor, integrity and dignity of the profession.
vii) Engineers shall continue their professional development throughout their careers and shall provide opportunities for the professional development of those engineers under their supervision.

2.5 Moral dilemma and ethical decision making

i) Dilemma

A situation necessitating a choice between two equally unpleasant/ undesirable alternatives. A problem that seems incapable of solution.

ii) Moral Dilemma:

A painful decision, where every solution involves some kind of loss is a moral dilemma. It is even worse, because whichever option you chose, someone or something will suffer. Decision has to be made on the morally correct course of action, not just the one you would prefer.

iii) Discussion on moral (ethical) dilemma on decision making taking reference of laws of ethics

In every pace of life, ethical dilemma happens on decision making process. Ethical dilemma happens on decision making process happens due to economic and social reasons for an institution and want or desire and duties for an individual. Disposal of industrial waste to the river basin may fulfill industries desire or wants due to economic reasons but it harm the environment and society. An individual does something to fulfill his wants or desire what he is not supposed to do. Asphalt lay during rainy seasons and day after broken out almost. Software model using crack version and cannot run properly.

On the basis of moral value, society can distinguish the good and bad things. The aim of manager need to create an ethically healthy climate for his or her employees, where they can do their work productively and confront a minimal degree or ambiguity regarding what constitutes right wrong behaviour. The aim of ethics is to define the nature of the highest good of a man as a member of society. Problems faced by a manager was examined in great detail to consider in detail the actual nature of the ethical dilemma in management and from that examination five conclusions were drawn concerning the complexity of managerial ethics. Ethical problems in management are complex and ethical decisions have:

a) Extended consequence

Most ethical decision has extended consequences. The decisions of manager have an impact upon others; both within the organization and within society; that is beyond their control and therefore should be considered when the decisions are made. *For example;* bribe (backhander) change governmental process, pollution affects environmental health unsafe products destroy individual lives.

b) Multiple alternatives

Most ethical decision decisions have multiple alternatives. Should a manager pay a bribe or not? Should a factory pollute the air or not? Should a company manufacture unsafe product or not? As has been seen in the simple illustration of bribery payments for import clearances Multiple alternatives have to be considered in making ethical choices.

c) Mixed outcomes

Most ethical decisions have mixed outcomes. Ethical issues in management are considered antithetical (negating). Pay an indirect bribe but maintain the sales volume of imported goods through prompt delivery. Cause some air or water pollution but avoid the cost of installing and operating pollution control equipment. Design a slightly unsafe product but reduce the material and labour costs of manufacture. Social benefits and costs as well as financial revenues and expenses are associated with almost all of the alternatives in ethical choices.

d) Uncertain consequences

Most ethical decisions have uncertain consequences. It is commonly thought that ethical issues in management are free of risk or doubt, with a known outcome for an alternative. Pay the bribe and receive the imported goods promptly. Investment in pollution control equipment, and the emission will be reduced X% at Y% costs of operation. Produce an absolutely safe product at an additional costs Z dollar per unit. It is not all clear what consequence will follow from most ethical choices.

e) Personal implications

Most ethical decisions have personal implication. It is commonly thought that ethical issues in management are largely impersonal. Many people believe that prima facie ethical decision in a given operation may reduce the profits of the company but not the executive's salaries or their opportunities for promotion. Maintain the sales of imported goods at expected levels, and despite slightly increased expenses for bribes, the quarterly review will be pleasant. Delay installation of pollution control equipment, and the rate of return will be close to the planed percentage. Redesign the product to reduce the material and labour cost, profit margin and chances of promotion will increase. Individual benefits and costs as well as financial social benefits and costs associated with most of the alternatives in ethical decisions.

2.6 DETAILED DUTIES OF AN ENGINEER AND ARCHITECT

Following are the details duty of an engineer and architect:

- Constantly participated in the ongoing activities at the constructions site.
- Estimating, planning, designing and surveying of the project.
- Quality control and supervise the work.
- Take responsibility for safety precautions at the job site.
- Familiar with construction customs and practices.
- To have the right to stop the work.
- Have the authority to issue variation order.
- Implementation of statutes, by laws and building regulations.
- Public and private right.
- Material planning and safety.
- Examination of site.

2.7 NEGLIGENCE AND LIABILITY

2.7.1 Negligence

Negligence is the lack of proper care or attention. Negligence is when one person fails to act to the standard of behavior expected of a reasonably prudent person in the same circumstances. Negligence usually results in harm to either the individual themselves or someone else and these harms

are what lead to personal injury claims. Unlike other areas of law, torts of negligence are governed by subjective standards of behavior rather than statutory requirements for conduct, such as in criminal law. The proof of negligence first begins with stating that the defendant's behavior was qualitatively below that of any other reasonable person in similar circumstances. With "reasonableness" being the standard for conduct, discussions over whether a defendant is actually guilty are understandably complicated.

2.7.2 Elements of Negligence

Following are the elements of negligence:

i) Duty

Unless there is a contractual duty to perform a work, there is no negligence in the performance of the work.

ii) Breach

Unless there is a breach of the terms and conditions of an agreement, professional negligence cannot be proved.

iii) Damages

Unless there is a specific damage to the claimant, professional negligence cannot be established.

iv) Proximate cause

There should be direct (one-to-one) relation between the specific action of a professional and the damage resulted by the action to the claimant.

2.7.3 Liability

It means being bound to pay damages restitutions. Liabilities means something that is a hindrance or puts a group or individuals at a disadvantage, or something that someone is responsible for, or sometimes that increases the chance of something occurring. There are three sources of liability which are:

i) Liabilities due to contract

Liable to fulfill all terms of contract; if there is no contract, legally, there is no liability under this category. An engineer is liable for loss of damage due to breach of contract clauses. Contract law imposes liability on a party for promises that the first has made to another party; liability related to loss of a single person's life/property.

ii) Liabilities due to criminal law

Liable to follow all prevailing laws of nation, breach of law related to design, construction and implementation of design can result in criminal case, whether there is damage or not. Criminal law imposes liability on a party due to illegal/ criminal acts; defendant has a liability to the government/state.

iii) Liabilities due to tort

Liable to prevent customers/users of products and services from loss or damage; even if there is no specific contract and no laws have been breached, an engineer can be held liable for loss or damage to the customer due to the use of services and products designed, constructed, or implemented by the engineer. Pre-information or pre-warning or disclaimer can prevent an engineer from liability due to tort. Tort provision is a legal mechanism for compensating individuals injured by others, whether deliberate or not; directed toward the compensation of individuals, rather than the public.

2.7.3.1 Types of liability

Following are the two types of liability:

i) Vicarious liability

Vicarious liability refers to a situation where someone is held responsible for the actions or omissions of another person. In a workplace context, an employer can be liable for the acts or omissions of its employees, provided it can be shown that they took place in the course of their employment. A company or a contractor/sub-contractor is liable for the acts of its own and its employees. Three tests are used to ascertain the degree of vicarious liability.

- Control test : Degree of liability depends on level of control a company has on its staff or contractor; the more control a company has over a person (employee) the more liable the company is.
- Business integration test : Degree of liability depends on level of business integration; the more the work of a person is integrated into the work of a company, the more liable the company is for the acts of the person, even if the person is not a direct employee of the company.
- Multiple test : Control test, business integration test, and other related factors are taken into consideration to determine the degree of liability.

ii) Partnership Liability

Liability of the partners in tort: The partners of a company are liable for the acts of one (or more) of its other partners.

2.7.3.2 Liabilities of engineers in project design

Following are the liability of an engineer during the project design:

i) Fitness for purpose

The design of a project (overall and component–wise) should be proper to serve the purpose of the project.

ii) Negligent misstatement

The designers and professionals are expected not to make any negligent or unsubstantiated misstatements.

iii) Statutes, bylaws and building regulations/codes

It is the duty of the designers and professionals to make themselves fully aware of the statutes, bylaws and codes related to their professional practice.

iv) Examination of site above and below the ground

Before finalizing a design, a designer should know the conditions of the site above and below the ground.

v) Public and private rights

The design of a project should not contradict with the public and private rights of the client and others who may be affected by the design implementation.

vi) Plans, drawings and specifications

The design should include detailed plan, drawing, and specification of each component of the project and equipment.

vii) Materials (quantity, quality and availability)

The details of the quantity and quality of materials to be used in a project should be specifically mentioned. The availability of the materials should be kept in mind while selecting the material types.

viii) Novel, risky design and employers' interference in design

A designer may choose to use novel and risky design and may decide to incorporate employer/client's idea in the design. However, the designer is ultimately responsible for the safety and fitness for purpose of the design implementation.

ix) Revision of design during construction

Even if the design is revised during construction, the designer is ultimately responsible for the safety and fitness for purpose of the design implementation.

2.7.3.3 Liabilities of engineers in project construction and implementation

Following are the liability of an engineer during project construction and implementation:

i) Completion of project in time, within budget.
ii) With quality: material, workmanship, method of construction.
iii) Consistency: in quality, form.

iv) Safety and welfare of project workers, people living in and around project area, and people travelling through or visiting the project area.
v) Follow applicable laws, rules, regulations, guidelines, conventions, codes and bylaws.
vi) Meet social obligations.

2.8 EXAM SOLUTION

1. How do you describe engineering profession? Explain the significant features of profession. [2069 Bhadra; W: 2+3]

Ans: See the definition part 2.1 and 2.1.1

2. Write short notes on: Nepal engineering council [2069 Bhadra; W: 2.5]

Ans: See the definition part 2.2.3.1

3. What are factors affecting the morale of a professional engineer? Describe in brief to justify and satisfy yourself in the content of Nepal, to have and maintain the professional and moral ethics. [2069 Bhadra; W: 2+3]

Ans: See the definition part 2.1.2 and 2.5

4. What do you understand by ethics? Why are codes of conducts required for professionals? [2070 Bhadra; W: 5]

Ans: See the definition part 2.4.1 and 2.4.3

5. What are the detailed duties of an engineer in the profession? [2070 Bhadra; W: 5]

Ans: See the definition part 2.6

6. How does a moral dilemma occur? What are the bases to solve moral dilemma? [2071 Bhadra; W: 4]

Ans: See the definition part 2.5

7. What are the codes of ethics for engineers to Nepal engineering council? [2071 Bhadra; W: 4]

Ans: See the definition part 2.2.3.1

8. Define moral dilemma. What are fundamental laws of ethics to overcome moral dilemma? [2071 Magh; W: 4]

Ans: See the definition part 2.5

9. What is profession? Describe the code of ethics for engineers. Explain tort and liability. [2072 Ashwin; W: 8]

Ans: See the definition part 2.1, 2.4.3 and 2.7

10. Write short notes on: Professional institutions. [2072 Ashwin; W: 2]

Ans: See the definition part 2.2.3

11. What do you understand by professional practice? Describe the relation of engineer with client, contractor and fellow engineers. [2072 Magh; W: 10]

Ans: See the definition part 2.3

12. What do you mean by profession? Explain its characteristics. [2073 Bhadra; W: 4]

Ans: See the definition part 2.3

13. What is ethics? Write in short the code of ethics for engineering profession. [2073 Bhadra; W: 4]

Ans: See the definition part 2.4.1 and 2.4.3

14. Write short notes on: [2073 Bhadra; W: 2×3]
    i) Jurisdiction of Nepal engineering council
    ii) Detailed duties and liabilities of an engineer and architect
    iii) Nepal engineers association

Ans: See the definition part 2.2.3.1, 2.6 and 2.2.3.2

15. Write down the fundamental characteristics of profession. List out the core ethical values to develop code of conduct for professionals. Define vicarious liability. [2073 Bhadra; W: 4]

Ans: See the definition part 2.1.1, 2.4.3 and 2.7.2.1

16. What are the duties and liability of an engineer and architect? [2074 Bhadra; W: 5]

Ans: See the definition part 2.6

17. What do you understand by negligence, tort and liability? What are the elements of negligence? [2074 Bhadra; W: 5]

Ans: See the definition part 2.7

18. Explain engineering morals, ethics and professionalism. [2074 Magh, W: 8]

Ans: See the definition part 2.4.2

19. How do you define a profession? What are the principles of engineering profession? [2075 Bhadra, W: 8]

Ans: A profession is defined as having a systematic knowledge acquired through specialized training or education and practicing the same as an occupation.

Following are the principles of engineering profession:

i) Integrity

Professional integrity includes demonstrating fairness in decision-making processes, acting in the best interest of the company and its clients, and treating colleagues with respect. Being a person of high integrity means consistently behaving in an ethical manner in every professional action or exchange.

ii) Respect

Principled professionals show respect for others and avoid harsh criticism of their colleagues' work. This professional allows others

the chance to speak and participate in workplace debates and carefully considers opposing points of view before making decisions. Courtesy guides an individual in personal interactions, even contentious ones. Respectful individuals do not divulge personal or professional confidences or talk about others in derogatory terms.

iii) Ethics

An ethical professional does not take advantage of others, claim credit for others' work, or misrepresent his own performance or the performance of his company. An ethical person does not participate in inappropriate or unlawful behaviors and strives to maintain an unblemished reputation for honesty and fair business dealings.

iv) Responsibility

A principled professional takes responsibility for his work product, his own performance and the performance of the teams he leads. This type of professional also acknowledges mistakes or shortcomings and works to correct problems and situations to the best of his ability. A responsible professional doesn't place undue blame on others, make false claims or statements or pawn off personal responsibilities on others.

v) Commitment

A committed professional dedicates himself to his responsibilities in all ways possible. This includes every effort to do his best work, whether independently or with a team, and to positively represent a company in public settings. Commitment to a profession means avoiding real or perceived conflicts of interest and honoring all contractual obligations.

20. How do you mean by moral dilemma? Explain various ways to overcome dilemmas? [2075 Magh]

Ans: Moral dilemma

A moral dilemma is a situation in which a person is torn between right and wrong. A moral dilemma involves a conflict with the very core of a person's principles and values. Moral dilemma involves a conflict with the very core of a person's principles and values. The choice the person makes may leave them feeling burdened, guilty, relieved, or questioning their values. A moral dilemma often forces the individual to decide which option he or she can live with, but any outcomes are extremely unpleasant no matter what. Moral dilemmas are often used to help people think through the reasoning for their beliefs and actions, and are common in psychology and philosophy classes. Some examples of moral dilemmas include:

- ✓ A husband learns he has a terminal illness and he decides to ask his wife for assistance in ending the pain before it gets too bad.
- ✓ A friend discovers her best friend's boyfriend is cheating. She must decide whether to tell her friend or keep it a secret.

Various ways to overcome dilemmas are as follows:

- ✓ Name the dilemma for yourself.
- ✓ Identify the interests you want to meet.
- ✓ Identify the assumptions embedded in the dilemma that keep the needs from being met.
- ✓ Describe the dilemma to others. Jointly design a solution that either challenges the assumptions or makes them irrelevant.

21. What are the professional institutions? What are the factors affecting the morale of profession. Explain the role of engineer for development of society. [2075, Magh]

Ans: Professional institutions

Professional institutions are the societies and associations that promote and further a career and the people who practice in it. *For examples;* NEA, SONA, etc.

Following are the factors affecting the morale of profession:

- ✓ Inadequate salary
- ✓ Defective social norms or value
- ✓ Low morale of the individual
- ✓ Non-regularities of law and regulations
- ✓ Lack of political commitment

Role of engineer for development of society

Engineering is one of the key influences that shape our society. Engineers don't just work with machines, designs, and electronics, they use math's and science to provide innovation and inventions that shape our society and improve the way we live and work. This means that engineers have a responsibility and also a great opportunity to ensure that they have a positive influence on society. Engineering makes it possible for people to live more easily and comfortably because we enable people to do more, with greater certainty, less effort, less consumption of material resources, and less energy. All that adds up to less cost, in any system of economics.

Engineers bring real benefits to ordinary people by following ways:

i) Efficiencies

Engineers create value by seeking efficiencies, reducing the materials, energy, time, and human effort needed to achieve a given result, reducing costs.

ii) Product differentiation

By designing products that provide improved buyer and end-user experience (product differentiation) engineers increase the use value of products and services.

iii) Innovation

Engineers create value for enterprises by innovating; finding new ways to achieve a given result that is better in some way than other known ways.

iv) Performance prediction

Engineers provide sufficiently accurate technical and commercial enterprise performance predictions creating enough confidence for investors to provide the resources needed to make new products or provide new services.

v) Community value creation

Engineers help enterprises co-create value in their communities through ethical behavior, improved safety, community capacity building, identifying and conserving resources, reducing or eliminating detrimental environmental and social impacts, and remediating environmental damage. Developing the community that hosts an enterprise rewards both the enterprise and the community.

vi) Environmental protection

Engineers protect naturally endowed value by conserving both the renewable and non-renewable resources of our planet, our home.

vii) Defense and security

Engineers provide many products and services that limit or prevent destructive behavior by other people, thus protecting accumulated value represented by our society and its various cultures and civilizations.

viii) Value creation through teaching

Engineers also create value through their teaching work developing knowledge, skills, and attitudes of others whom they work with.

22. What do you understand by ethics with examples? Why is code of conducts required for professionals? [2075 Magh]

Ans: Ethics

Ethics is a system of moral principles. They affect how people make decisions and lead their lives. Ethics is concerned with what is good for individuals and society and is also described as moral philosophy. The term is derived from the Greek word ethos, which can mean custom, habit, character or disposition. Examples of ethical behaviors in the workplace includes; obeying the company's

rules, effective communication, taking responsibility, accountability, professionalism, trust and mutual respect for your colleagues at work. These examples of ethical behaviors ensure maximum productivity output at work.

Professional codes of conduct draw on these professional ethical principles as the basis for prescribing required standards of behavior for members of a profession. They also seek to set out the expectations that the profession and society have of its members. The intention of codes of conduct is to provide guidelines for the minimum standard of appropriate behavior in a professional context. Codes of conduct sit alongside the general law of the land and the personal values of members of the profession.

Professional codes of conduct provide benefits to:

- ✓ The public, as they build confidence in the profession's trustworthiness
- ✓ Clients, as they provide greater transparency and certainty about how their affairs will be handled
- ✓ Members of the profession, as they provide a supporting framework for resisting pressure to act inappropriately, and for making acceptable decisions in what may be 'grey areas'
- ✓ The profession as a whole, as they provide a common understanding of acceptable practice which builds collegiality and allows for fairer disciplinary procedures
- ✓ Others dealing with the profession, as the profession will be seen as more reliable and easier to deal with.

23. Define profession. Illustrates elements of profession. [2076 Bhadra, W: 4]

Ans: See the definition part 2.1 and 2.1.1, elements means characteristics of the profession

24. Write down the professional code of conduct issued by Nepal Engineering Council. Elaborate the professional benefit you will get from NEA. [2076 Bhadra, W: 4]

Ans: For the first part

See the definition part 2.2.3.1

For the second part

Following are the professional benefit that we get from NEA:

i) Networking

Networking is probably one of the main benefits of joining a professional association-you get to meet leaders and specialists in the field.

ii) Professional development

A professional needs to keep up to date with all the latest developments in the financial services industry.

iii) Education

Professional associations also play a large part in the higher education arena. Professional associations also offer bursaries and internships for students and people wishing to enter this field of study.

iv) Keeping up to date with legislative developments

Adding on to the benefits already mentioned, a professional association will send out regular newsletters noting the latest developments and prospective legislation. This ensures that you and your company will stay up to date with compliance regulations and can implement prospective legislation in time.

v) Codes of conduct

In the highly regulated sphere that we work in, ethics plays a major role. Most professional associations have codes of conduct noting best practices that their members live by. Marisa stresses the importance of these, "This in return professionalizes the industry, giving it and the people credibility and trustworthiness."

vi) Designation

One of the key goals for professional development is often the attainment of a particular designation. Professional associations also hold special designations for members with specific educational and experience levels. It is a way of seeing your career evolves, climbing the corporate ladder. It also brings the pride that comes with the notation of a designated title.

vii) Social responsibility

An aspect that is equally as important is giving back. Professional associations provide members with a means to give back to the community via outreaches, sponsorships and fundraisers.

viii) Jobs

Last but not least, is the opportunity to connect with prospective employers. Particularly in today's economic environment with unemployment at an all-time high.

25. Define profession. Illustrate elements of profession.
[2077 Chaitra; W: 4]

Ans: See the definition part 2.1 and 2.1.1 (elements mean characteristics of the profession)

26. List the major professional codes of conduct for engineers according to the Nepal Engineering Council (NEC). Should NEC conduct exam for issuing license in Nepal? Argue for and against it. **[2077 Chaitra; W: 2+2]**

Ans: **For the first part**

See the definition part 2.2.3.1

For the second part

Case I : Arguing for the statement

Yes, NEC should conduct exam for issuing license in Nepal. The number of engineering colleges in Nepal has increased drastically due to which large number of engineers are produced every year. But the quality of engineers has reduced significantly. Conducting license exam helps to filter out incapable engineers to some extent and makes the engineering sector more systematic and dignified. In fact, the quality of engineers is of greater importance than quantity.

Case II : Arguing against the statement

The current engineering education system is more theoretical based rather than practical based and if the exam is conducted by drafting same old syllabus, it proves to be pointless and ineffective. It won't act as a benchmark of judging or evaluating engineers.

27. Explain the methods for making ethical, proper and good decisions in engineering profession. **[2077 Chaitra; W: 4]**

Ans: Engineers need to make ethical decisions in various stages of their works. They should be prepared to take crucial decisions while confronting the society.

Following are the methods or approaches for making ethical, proper and good decisions in engineering profession:

i) Utilitarianism approach

The professionals or individuals should act in the way to creating the greatest benefits for the largest number of people with lowest cost and harm to others. This method is based upon the outcome or results of the act. An engineer should be aware of his or her act for its results or outcomes.

ii) Universalism approach

This approach is based upon the motive or intent of the doers. The professionals must have good motives behind their doings. A professional, as an engineer, have duties and obligations towards the society he lives in.

iii) Distributive justice approach

A decision or act is right only if the least advantaged member of the society somehow enjoys a better standard after the decision

compared to before. The professionals must have back in the mind that the law applies equally to all. The method promotes the outgrowth of equality.

iv) Personal liberty approach

This approach is based upon the primacy of personal liberty. Any action of professional or individual must not violate anybody's liberty at all even if the act creates greater benefits for the larger number of people.

v) Eternalism approach

This approach is based on the common sets of moral standards and good behaviors. The professionals should act in accordance with the common set of standards. "Do onto others as you would have others do onto you" is an example.

28. What do you understand by the term ethics? Why is it necessary for a professional to follow code of conducts? [2078 Chaitra; W: 4]

Ans: See the solution of Q. no. 22

29. Write short notes on: Liability and Negligence [2078 Chaitra; W: 4]

Ans: See the definition part 2.7

30. Why is ethics and moral necessary in engineering profession? Write and explain the bases of making ethical decision. [2079 Jestha; W: 4+6]

Ans: **For the first part**

Ethics are the set of policies, values or decisions that are morally desirable in engineering practice and research. The primary obligation of an engineer is to protect the safety, health, property and welfare of the public. No matter what type of engineer one is, ethics and morals is important to ensure safety and welfare. Ethics also emphasize that engineers shall not promote their own interests at the expense of dignity and integrity of the profession.

Morals are essential for engineers particularly during supervision and performing team works. For example, an engineer whether he works individually or works for a company, has to go through some ethical issues, mostly under the conditions such as conceptualization of a product, issues arising in design and testing departments, or may be on the issues involving the manufacturing, sales and services. Morality drivers engineers towards honesty, impartiality and fairness.

The ethical decisions and moral values of an engineer need to be considered because the decisions of an engineer have an impact on the products and services–how safe they are to use, how the society benefits from it, how the environment gets affected, etc. In conclusion, ethics and morals ensure that engineers perform under a standard of professional behaviour adhering to the highest principles of ethical conduct and hence it forms an integral part of culture of engineering. Every engineer needs the knowledge of ethics and morals before engaging in any act of service to maintain high levels of professionalism.

For the second part

See the definition part 2.4.2 (Laws of ethics act as bases of making ethical decision)

Chapter 3

PROFESSIONAL PRACTICES IN NEPAL

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- Professional Practices of engineering in Nepal are guided.
- Formally by the laws/acts, guidelines, directives, cabinet decisions, standards and codes.
- Guidelines, and code of Ethics of professional bodies like Nepal Engineers' Association, SCAEF, FCAN, CAN, IEEE.
- Informally by the practices in specific institutions.

3.1 PUBLIC SECTOR PRACTICES

Government organizations like ministries, departments, regional and district offices, corporations, institute of engineering etc. are public sectors. Public sectors in Nepal are understood the organizations that are run by the budget sanctioned by the Government. The organizations in which qualified people can compete for participation are public organizations. All the ministries and departments, regional offices, district offices and other sister organizations are the public sectors wherein any qualified Nepalese citizen can apply and be nominated for the job.

Sample list of public organizations (ministries) where engineers are involved/employed are as follows:

i) Finance
ii) Home affairs
iii) Foreign affairs
iv) General administration
v) Law and justice

vi) Land-reform and land management
vii) Women, children and social welfare
viii) Education and sports
ix) Defense
x) Health
xi) Labor and transport
xii) Industry, commerce and supply
xiii) Agriculture and cooperative
xiv) Population and environment
xv) Culture, tourism and civil aviation
xvi) Irrigation
xvii) Energy
xviii) Physical infrastructure and transports
xix) Forests and soil conservation
xx) Science and technology
xxi) Information and communication
xxii) Federal affairs and local development

Note

The name of the ministries keeps changing. Many more engineers are employed in the departments under the ministries.

Sample list of public/semi-public organizations where engineers are involved/employed is as follows:

1. Nepal telecommunication authority
2. Nepal airlines corporation
3. Diary development corporation
4. Nepal industrial development corporation
5. Nepal electricity authority
6. Nepal rastra bank
7. Agricultural development bank
8. Rastriya banijya bank
9. TU/PU/PU/MWU/FWU/KU
10. University grants commission
11. Hetauda cement factory
12. Udayapur cement factory
13. Nepal telecom
14. CAAN
15. Diary development corporation
16. Investment board Nepal
17. Salt trading corporation
18. Industrial estates (Balaju, Patan, Pokhara, Hetauda, ...)
19. Central Bureau of statistics
20. Nepal Bureau of standards and metrology

The duties of engineers in public sectors are mainly:

- Design and estimate of specified project, infrastructure etc.
- Preparation of technical specification, tender documents, contract document, agreement paper etc.
- Evaluate and supervise the project assigned him/ her.
- Allocation of resources.
- Working as a member of investigation committee.
- Planning
- Provide suggestion, recommendation as their expertise.

3.2 PRIVATE SECTOR PRACTICES

Construction companies, consulting companies, private engineering colleges etc. are private sectors. In the open market system, there have been thousands of private organizations in operations in various sectors. As engineers are the technical personnel who work for the greater benefits of the public, entrepreneurs have used them in producing larger quantities in economic investments. Therefore, there are private organizations working more efficiently than government sectors under strict supervision and motivations. There are nearly 50 private colleges affiliated to seven universities-governmental and non-governmental. Construction companies and consulting firms are numerous. Construction companies alone are above 20000-including A, B, C, and D classes. There are many computer institutes to teach computer literacy to computer software design and programming. Private organizations have accelerated their business with the largest technologies available in Nepal. E-Businesses have occurred in Kathmandu. All those private's organizations employ engineers and the engineers have opportunities to practice their engineering profession in there.

Sample list of private organizations where engineers are involved/employed are as follows:

i) Construction companies-class A, B, C, D
ii) Consulting firms or consultants
iii) Clients or employers
iv) Private engineering colleges
v) Computer institutes
vi) Hospitals
vii) Research centers
viii) Training centers

The duties of engineers in private sectors are mainly:

- Design, supervision and quality control.
- Production, operation, inspection and maintenance.
- Material procurement, contract documents, billing etc.
- Research and development works, lecturers, project works

3.3 GENERAL JOB DESCRIPTIONS OF FRESH GRADUATES IN BOTH PUBLIC AND PRIVATE SECTORS

General job descriptions of fresh graduates in public sectors

- To perform preliminary and detail survey, design and estimate.
- To execute and assign for execution of project works.
- To conduct various programs for increasing people's capacity.
- To report writing of-progress report, feasibility report, final report, monitoring and evaluation report etc.
- To execute other jobs planned specifically for engineers as the nature and case is.
- To monitor and evaluate ongoing projects.
- To facilitate donor agencies is involved.
- To monitor and coordinate the operation and maintenance of facilities.
- To execute and perform works and jobs assigned by immediate superiors.

General job descriptions of fresh graduates in private sectors

- To coordinate works between stakeholders-clients, consulting and contractors.
- To layout works, to survey and to estimate.
- To supervise, monitor, and control works.
- To control quality, to assess and report to concerning authorities.
- To prepare bills as a quantity surveyor.
- To plan project and report progress.
- To prepare technical report and prepare claims if any.
- To conduct necessary training regarding site work and office organizations system to new staffs.
- To overall manage of construction project etc.

Job descriptions of civil engineer

- Designs construction projects by studying project concept, architectural drawings, and models.
- Prepares engineering design by collecting and studying reports, maps, drawings, blueprints, aerial photographs and tests on soil composition, terrain, hydrological characteristics, and related topographical and geologic data.
- Determines project costs by calculating labor, material, and related costs.
- Prepares feasibility study by analyzing engineering design; conducting environmental impact studies; assembling data.
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- Prepares feasibility study by analyzing engineering design; conducting environmental impact studies; assembling data.
- Prepares engineering documents by developing construction specifications, plans, and schedules.

- Confirms adherence to construction specifications and safety standards by monitoring project progress; inspecting construction site; verifying calculations and placements.
- Fulfills project requirements by training and guiding operators.
- Maintains operations by enforcing project and operational policies and procedures.
- Provides engineering information by answering questions and requests.
- Complies with federal, state, and local legal requirements by studying existing and new legislation; anticipating future legislation; enforcing adherence to requirements; advising management on needed actions.
- Maintains project data base by writing computer programs; entering data; completing backups.
- Contributes to team effort by accomplishing related results as needed.

Job descriptions of electrical engineer

- Evaluates electrical systems, products, components, and applications by designing and conducting research programs; applying knowledge of electricity and materials.
- Confirms system's and components' capabilities by designing testing methods; testing properties.
- Develops electrical products by studying customer requirements; researching and testing manufacturing and assembly methods and materials.
- Develops manufacturing processes by designing and modifying equipment for building and assembling electrical components; soliciting observations from operators.
- Assures product quality by designing electrical testing methods; testing finished products and system capabilities.
- Prepares product reports by collecting, analyzing, and summarizing information and trends.
- Provides engineering information by answering questions and requests.
- Maintains product and company reputation by complying with federal and state regulations.
- Keeps equipment operational by following manufacturer's instructions and established procedures; requesting repair service.
- Maintains product data base by writing computer programs; entering data.
- Completes projects by training and guiding technicians.
- Maintains professional and technical knowledge by attending educational workshops; reviewing professional publications; establishing personal networks; participating in professional societies.

- Contributes to team effort by accomplishing related results as needed.

Job descriptions of mechanical engineer

- Evaluates mechanical and electromechanical systems and products by designing and conducting research programs; applying principles of mechanics, thermodynamics, hydraulics, heat transfer, and materials.
- Confirms system and product capabilities by designing feasibility and testing methods; testing properties.
- Develops mechanical and electromechanical products by studying customer requirements; researching and testing manufacturing and assembly methods and materials; soliciting observations from operators.
- Develops manufacturing processes by designing and modifying equipment for fabricating, building, assembling, and installing components.
- Assures system and product quality by designing testing methods; testing finished-product and system capabilities; confirming fabrication, assembly, and installation processes.
- Prepares product reports by collecting, analyzing, and summarizing information and trends.
- Provides engineering information by answering questions and requests.
- Maintains product and company reputation by complying with government regulations.
- Keeps equipment operational by coordinating maintenance and repair services; following manufacturer's instructions and established procedures; requesting special services.
- Maintains system and product data base by writing computer programs and entering data.
- Completes projects by training and guiding technicians.
- Maintains professional and technical knowledge by attending educational workshops; reviewing professional publications; establishing personal networks; participating in professional societies.
- Contributes to team effort by accomplishing related results as needed.

Job descriptions of electronics engineer

- Using a mix of science and math's, along with engineering techniques, to design, produce, install and maintain telecommunications systems.
- Designing and managing equipment used to control and monitor processes, systems and machinery in many different areas.

- Using and designing systems to control pressures and temperatures and to manage waste in manufacturing industries.
- Writing specifications and drawing up theoretical designs to create user-friendly interfaces
- Planning projects and preparing and managing budgets
- Writing technical reports and keeping up to date with developments in technology and regulations.
- Evaluating operational systems and recommending design modifications to eliminate causes of malfunctions or changes in system requirements.
- Using computer-assisted engineering (CAE) and design software and equipment to perform engineering tasks.
- Contributes to team effort by accomplishing related results as needed.

3.4 EXAM SOLUTION

1. **What are the job description of a fresh engineer that can been appointed in a public organization.** **[2070 Bhadra; W: 5]**

Ans: See the definition part 3.3

2. **Write short notes on: Job description of fresh engineers in public and private sector** **[2072 Magh; W: 2.5]**

Ans: See the definition part 3.3

3. **Write short notes on: Job description of fresh graduates** **[2073 Bhadra; W: 2]**

Ans: See the definition part 3.3

4. **What do you understand by practical engineering profession? List down at least 5 organizations each in public and private sector.** **[2073 Bhadra; W: 4]**

Ans: See the definition part 3.1 and 3.2

5. **Explain general job descriptions of engineers working in the public sectors.** **[2074 Magh, W: 4]**

Ans: See the definition part 3.3

6. **What may be the job descriptions of a freshly graduated engineer in public sector?** **[2075 Bhadra, W: 5]**

Ans: See the definition part 3.3

7. **What are the job descriptions of a freshly graduated engineer in a private sector?** **[2076 Bhadra, W: 4]**

Ans: See the definition part 3.3

8. **Which one is better, a career in the government sector or the private sector? Compare and present with the job descriptions in both sectors.** **[2077 Chaitra; W: 4]**

Ans: **For the first part**

A career in the government sector is better in terms of stability and security compared to private sector. Government jobs come with several benefits which make them more attractive compared to private sector jobs. Those benefits are explained as follows:

i) On-time salary and generous leave policies

One of the major benefits of working in government sector is that employees receive their salaries on time. This is in stark contrast to the private sector, where delays in salary payments are not uncommon. Employees can avail of a number of paid leaves, including casual leaves, medical leaves and maternity leaves.

ii) Pension

Employees working in government sector for a long time are eligible for pension after retirement. But in the private sector, employees have to make their own arrangements for post-retirement financial security.

iii) Career growth

Jobs in government sector offer better opportunities for career growth. As a result, there are more positions available for advancement. The government sector also provides employees with more training and development opportunities.

iv) Salary increment

Government jobs offer a more stable and predictable career path when compared to private sector. The government employees receive regular salary increments, thus ensuring that their wages keep pace with inflation.

v) Power in hands

Government jobs also offer more power and authority to employees. This is because the government sector is often seen as the most important sector in any economy.

In conclusion, government jobs have unique advantages that private sector jobs cannot offer.

For the second part

See the definition part 3.3

9. **Write down the job description of a fresh engineering graduate appointed to a public organization.** **[2078 Chaitra; W: 4]**

Ans: See the definition part 3.3

10. **From the history of engineering profession, what lessons the freshly graduated engineers would learn. What are the sectors that engineers in Nepal can practice their profession?** **[2079 Jestha; W: 5+5]**

Ans: **For the first part**

Freshly graduated engineers can learn lessons from the history in many ways. Historical case studies of failures act as major sources of lessons in terms of broadening technical experience. For example, case studies of past structural or system failures can provide a civil engineer more clear-cut way of determining material efficiency and adequate safety of a particular design. Historical knowledge provides an engineer with new perspectives on contemporary design problems. The most sobering lesson to be learned from the history of failures is that an engineer should not be too complacent or over confident in their work. The past failures highlight the need of good judgment and provide guideposts for negotiating around the pitfalls in the design process. The history of engineering profession not only teaches valuable technical lessons, but also the sociological, legal and ethical ones.

Another important lesson to be learned from the history of engineering profession is that engineers should always act by the code of ethics and stay loyal to their profession. There have been numerous instances of engineers being arrested on the charge of corruption in the past. Such criminal offence not only exposes the engineer to the media and public, but leads to cancellation of his/her engineering license. Hence, engineers should always act in a manner so as to uphold and enhance the honor, integrity and dignity of the profession and always reject bribery in all its forms. Except the salary, allowance and facilities to be received for the service provided, one shall not obtain improper financial benefit of any kind.

History suggests that unethical practices of engineers such as carelessness, underestimations, negligence, faulty engineering design, problems in safety protocol, etc. lead to disastrous engineering failures. Hence, freshly graduated engineers should work responsibly in the field of their competencies and always adhere to the principles of ethical conduct to protect the safety, health, property and welfare of the public.

For the second part

See the definition part 3.1 and 3.2

11. **What are the job description of a freshly graduated engineer in a public sector of Nepal?** **[2079 Jestha; W: 5]**

Ans: See the definition part 3.3

- Complete Manual of Engineering Professional Practice
- Publish minimum 15 days' notice in national or local newspaper.
- Minimum three quotations are required.
- Bid validity is 45 days.
- Bid security validity is minimum 75 days.
- Publish minimum 7 days notice for agreement and no withdraw/modifications.
- Contract within below or the equal of estimate amount.

iii) National competitive bidding (NCB)

- Publish 30 days notice in national newspaper or website.
- Bid validity is 90 days up to 10 crore and 120 days above 10 crore.
- Bid security validity is 120 days up to 10 crore and 150 days above 10 crore.
- Publish minimum 15 days' notice for agreement.
- One time withdraw and modifications.
- Selection notice for 7 days.
- Single or JV (Joint Venture) maximum three and not less than 25%share of each.

iv) International competitive bidding (ICB)

- 45 days notice in national English newspaper or international journal or website.
- Minimum one responsive bid /single of JV.
- Estimate amount more than 2 Arba for the construction works.

v) User's committee

- Including all cost, estimate up to 10 million (1 Crore) of works.

Methods of procurement of goods, works and services as per PPA – 2063 and PPR – 2064 and their limit of amount are as follows:

S.N.	Methods of procurement	Limit of procurement amount
A	**Procurement of goods and works or other services**	
1	National competitive bidding (NCB): Without prequalification	Above 20 Lakhs and up to 2 Arab
2	International Competitive Bidding (ICB)	Above 2 Arab
3	Sealed quotation	Up to 20 Lakhs
4	Direct purchase	Up to 5 Lakhs
5	Lump sum price rate	Up to 2 Crores
6	Catalogues shopping	Up to 60 Lakhs with VAT
7	Procurement by other methods	Competition as per design document
B	**Procurement of consulting services**	
1	Invitation for competitive proposals (LOI and EOI)	

Chapter 4

CONTRACT MANAGEMENT

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4.5.6 Methods of recruitment of consultants

4.1 METHODS OF WORK EXECUTION

Following are the methods of work execution in Nepal:

i) **Direct purchase**

- Minimum three quotations from standing list are required, purchase is above NRs. 25000.
- Estimate up to NRs. 500000 for construction work and estimate up to NRs. 300000 for goods.
- Estimate up to NRs. 1500000 for domestic products in a fiscal year.

ii) **Seal quotation**

- Estimate up to 2 million (20 lakh) for construction works and estimate up to1 million (10 lakh) for goods.

- Complete Manual of Engineering Professional Practice
- Publish minimum 15 days' notice in national or local newspaper.
- Minimum three quotations are required.
- Bid validity is 45 days.
- Bid security validity is minimum 75 days.
- Publish minimum 7 days notice for agreement and no withdraw/modifications.
- Contract within below or the equal of estimate amount.

iii) **National competitive bidding (NCB)**

- Publish 30 days notice in national newspaper or website.
- Bid validity is 90 days up to 10 crore and 120 days above 10 crore.
- Bid security validity is 120 days up to 10 crore and 150 days above 10 crore.
- Publish minimum 15 days' notice for agreement.
- One time withdraw and modifications.
- Selection notice for 7 days.
- Single or JV (Joint Venture) maximum three and not less than 25%share of each.

iv) **International competitive bidding (ICB)**

- 45 days notice in national English newspaper or international journal or website.
- Minimum one responsive bid /single of JV.
- Estimate amount more than 2 Arba for the construction works.

v) **User's committee**

- Including all cost, estimate up to 10 million (1 Crore) of works.

Methods of procurement of goods, works and services as per PPA – 2063 and PPR – 2064 and their limit of amount are as follows:

S.N.	Methods of procurement	Limit of procurement amount
A	**Procurement of goods and works or other services**	
1	National competitive bidding (NCB): Without prequalification	Above 20 Lakhs and up to 2 Arab
2	International Competitive Bidding (ICB)	Above 2 Arab
3	Sealed quotation	Up to 20 Lakhs
4	Direct purchase	Up to 5 Lakhs
5	Lump sum price rate	Up to 2 Crores
6	Catalogues shopping	Up to 60 Lakhs with VAT
7	Procurement by other methods	Competition as per design document
B	**Procurement of consulting services**	
1	Invitation for competitive proposals (LOI and EOI)	

1.1	National level competitive proposal (NCB)	Above 20 Lakhs and up to 10 Crores
1.2	International level competitive proposal (ICB)	Above 10 Crores
2	Preparation of standing list	Up to 20 Lakhs
3	Direct purchase/negotiation	Up to 5 Lakhs
4	Others mode of procurement	Based on qualification
C	**Procurement of specific civil works**	
1	Force account	Up to 1 Lakh
2	User committees or beneficiary committees	Up to 1 Crore

4.2 TYPES OF CONTRACT

4.2.1 Contract

'Contract' means an agreement enforceable by law concluded between two or more parties for performing or not performing any work.

A contract is a voluntary agreement between two or more parties that a court will enforce. The rights and obligations created by a contract apply only to the parties to the contract (*i.e.*, those who agreed to them) and not to anyone else.

Elements of contract

i) Agreement–offer and acceptance

The parties to the contract should have a mutual understand regarding the subject-matter of the contract. There must be a "lawful offer" and "lawful acceptance" thus resulting in an agreement. The parties must have agreed to the subject-matter in the same sense.

ii) Legal purpose

There must be an intention among the parties that the agreement should be attended to by legal consequences and create legal obligation. Agreements of social or domestic nature do not contemplate legal relations.

iii) Lawful consideration

Consideration means 'something in return'. In every legal contract, there must be something in return. An agreement is legally capable to be enforced only when each of the parties to it gives something and gets something. The consideration should not be unlawful, illegal, immoral or opposed to public policy.

iv) Capacity to contract

Every person who enters into a contract must be competent. In other words, the person should be of the age of majority, should have a sound mind, and must not be disqualified from any law to which they subject.

Minors, lunatics, unsound and intoxicated persons are incompetent to enter into a contract. However, there are exceptions as defined in section 68. In case of an exception the minor or lunatic is not personally liable.

v) Consent to contract

All the parties must have agreed upon the subject matter of the agreement in the same sense. Section 14 says that if the agreement is induced by coercion, fraud misinterpretation or mistake, it is said to be "no free consent" and such a contract is voidable and cannot be enforceable by law.

vi) Lawful object

If the object in the agreement is unlawful, the agreement is void. *For example;* the landlord cannot recover rent through court of law when he knowingly lets his house to carry on prostitution.

vii) Certainty

Every agreement of the contract must be certain. If the agreement is not certain or incapable of being made certain, it is void.

viii) Possibility of performance

Every contract must be capable of performance. Otherwise, the agreement is void. An agreement to do an impossible act whether physically or legally, is void.

ix) Not expressly declared void

The agreement must not have been expressly declared to be void under the Act. Examples of such agreements are restrainment of trade, marriage, legal proceedings and wagering agreements. Such agreements are not enforceable by law.

x) Legal formalities like writing, registration etc.

A contract may be oral or in writing according to the Indian Contract Act. In certain special cases the agreement must be in written. In some cases, like contracts by companies, selling or buying of shares etc., the contract must be registered.

All the above ingredients must be satisfied in every valid contract. It can be noted that all contracts are agreements, but not all agreements are contracts.

4.2.2 Types of Contracts in Terms of Legality

There are three types of contract in terms of legality, they are:

I) Void contract

"An agreement not enforceable at law is a void contract". Originally it is a valid contract but due to certain reasons it becomes void after its formation. A void contract cannot be enforced by either party.

Features of void contract

- It is not enforceable by law.

- It creates no legal rights.
- It creates no obligations on any party.
- An agreement which is against the public policy or against any law is also void.
- Under this contract no compensation can be paid to any party.
- An agreement in restraint of marriage and trade are common examples of void contract.

Example: Sachin and Isha contract to marry on next Sunday. Isha dies before the Sunday. The contract becomes void.

Rights and Duties: In this case the parties are not legally responsible to fulfill the contract. If any party has received any benefit is bound to return.This contract takes place when consent of one of the parties is not free.

ii) Voidable contract

"An agreement which is enforceable by law at the option of one or more of the parties, there to but not at the option of the other or others is a voidable contract".

Features of Voidable Contract

- It is enforceable at law at the option of one or more of the parties.
- A voidable contract can only be objected by the party who has been subject to fraud, coercion, misrepresentation and undue influence.
- If the contract is revoked by a person rightfully then he can also receive the compensation.
- The contract is voidable at the option of the party whose consent is caused.
- Contracts caused by fraud, undue influence, misrepresentation or by coercion are voidable contracts.

Example: Mr. Sanjeeb threatens to shoot Mr. Shah to purchase a car for one million. Mr. Shah agrees the contract was made by coercion and is voidable at the option of Mr. Shah.

Difference between void and voidable contract

The major differences between void contract and voidable contract are as under:

1. A contract which lacks enforceability is void contract. A contract which lacks the free will of one of the parties to the contract is known as voidable contract.
2. A void contract was valid at the time when it is created, but later on, it becomes invalid. Conversely, the voidable contract is valid until the aggrieved party does not revoke it within stipulated time.
3. When it is impossible, for an act to be performed by the parties, it becomes void, as it ceases its enforceability. When the consent of the parties to the contract is not free, the contract becomes voidable at the option of the party whose consent is not free.

4. In void contract, no party can claim any damages for the non-performance of the contract. On the other hand, the aggrieved party can claim damages for any loss sustained.

iii) Valid contract

Valid contract is that which is enforceable at law. It creates legal obligations between the parties. It enables one party to compel another party to do something or not to do something.

Parties obligations: In case of valid contract all the parties to the contract are legally responsible for the performance of a contract. If one party breaks the contract other has right to be enforced through the court.

Example: Surendra proposes sell his one-ropani land to Prakash for one million and the parties are capable to do the contract by law. So, this contract is valid. If Surendra fails to deliver the land Prakash can sue him in the court for the delivery of land. On other hand Prakash fails to make the payment, Surendra can sue him for the recovery of payment.

4.2.3 Types of contracts in terms of nature of work in construction work

Following are the different types of contract in construction works on the basis of their nature:

Unit rate contract

Unit price contract is a type of contract based on estimated quantities of items included in the project and unit prices (hourly rates, rate per unit work volume, etc.) In general, contractor's overhead and profit are included in the rate. The final price of the project is dependent on the quantities needed to carry out and complete the work. In general, this contract is only suitable for well-known resources involved project but unknown quantities at the time of the contract which will be defined when the design and engineering or construction work is completed.

Advantages

- Easy for contract selection.
- Early start is possible.
- Saves the heavy cost of preparing many bills of quantities by the contractors. Fair basis for competition.
- In comparing with lump-sum contract, changes in contract documents can be made easily by the owner.
- Lower risk for contractor.

Disadvantages

- Final cost not known from the beginning (BOQ only is estimated).
- Staff needed to measure the finished quantities and report on the units not completed.

- Unit price sometime tend to draw unbalanced bid. (For Unit-rate contracts, a balanced bid is one in which each bid is priced to carry its share of the cost of the work and also its share of the contractor's profit. Contractors raise prices on certain items and make corresponding reductions of the prices on other items, without changing the total amount of the bid.)

Design and Build Contract

Design-build contracts are an excellent contracting method widely used around the world. As the name implies, this type of contract is used when both design and construction take place simultaneously throughout the length of the contract. However, many owners tend to select other contracting methods instead because a design-build contract can present some challenges and situations in which the final cost cannot be easily determined or projected. Primarily, design-build is used when an opportunity exists for the owner or agency to save time by having construction begin before the final design has been completed. The traditional system of design-bid-build has been used for many years. It is based on the assumption that the owner has the design plans in hand before bidding out the construction on a project to the lowest bidder. Many projects could be more cost-effective if they could be implemented faster, thus the evolution of design-build.

Advantages

- Reduces design time.
- Simplifies construction drawings.
- Value engineering alternatives are always up for discussion and analysis
- Reduces construction calendar.
- Minimizes communication channels with a single point of contact
- Minimal change orders.
- Fast track schedule.
- Customized to actual site conditions easily.
- Identify long lead items earlier.
- Allows for the project to be repeated.

Disadvantages

- The project outcome might not produce the expected result.
- A project that is not scheduled properly might be substantially delayed.
- The contract doesn't impact labor costs.
- Final costs can be reasonably higher than original estimates.
- Eliminates the possibility of using an integrated design.
- The counterweight between a contractor and the design team might be reduced, and some conflicts might appear.

- The architect's vision could appear to favor the contractor.
- If the project's inspector and team are not experienced, problems could become frequent and costly repairs will be needed.

Lump sum contract

A lump sum contract (or fixed price contract) is a type of contract which a single lump sum price for all of the works are performed. A contractor under the lump sum contract is responsible for completing the project within the agreed fixed cost set forth in the contract. If the contractor completes the project under the agreed fixed total cost, then the contractor may make additional profits from the project. The lump sum contract is normally used in the construction industry to reduce design and contract administration costs. The lump sum contract is the most recognized agreement form on simple and small projects, generally it is appropriate where the project is already well defined, and changes are unlikely therefore the owner must have sufficiently detailed and complete drawings and specifications, and construction documents at the time of the bid to allow the bidders to properly estimate the cost of labor and materials. The lump sum contract can include incentives or benefits for early completion, or can also have penalties, called liquidated damages for a late completion.

Advantages (For owner)

- There is certain degree of limitation over owner's exposure as well as accountability at the time construction since he has already agreed upon a fixed rate.
- Since the contractor has accepted a fixed price for the construction, the owner is not liable for any over expenditure. This is the most important benefit.
- It is much simpler to get construction loan with a Lump sum contract as it provides a high degree of certainty as far as cost is concerned.
- It is much easier to supervise and manage Lump sum contracts.
- The payments are made after fixed durations and that too based on the amount of work completed unlike the balloon payments in other arrangements.

Advantages (For contractor)

- There is a greater margin for profit realization for contractors as well as designers.
- Due to its general reliability, contractors try to enhance quality of production and performance and try to complete work faster.
- Lump sum contracts offer comparatively easier assessment of soil conditions, bidding prices and pre- construction analysis which makes selection process less tedious.

- Accounting related to lump sum contracts are low-intensive that diminishes overhead expenses of the contractor and allow for stable cash flow.

Disadvantages

- Lump sum contracts pose greater risk to contractor.
- Quantifying changes is a big challenge. Such contracts demand documentation and record keeping of change orders at all stages that further requires more paperwork.
- Rejection of change order requested by the employer.
- The building and construction design and plans have to be completed well before beginning the execution of activities.
- The overall construction completion could take longer than other contractual alternatives.
- Since the contract is based on fixed price, the contractor may start using sub-standard means and methods and products. In such a case, the owner should specify building materials well in advance.
- Lump-sum contracts usually end up with higher fixed price to cover unforeseen circumstances. Owners are responsible for unpredicted conditions which are beyond the control of either party.

Build own and operate transfer (BOOT) contract

A build, own, operate and transfer (BOOT) contract is a project delivery model that can be used to for large projects, developed through Public Private Partnerships (PPPs). The term 'Public Private Partnerships' refers to a very broad range of partnerships in which the public and private sectors collaborate for some mutual benefit. Under a BOOT contract, a private organization undertakes to complete a large project, such as a complex infrastructure project, which they are granted a concession to finance and build by a public-sector partner, typically a government department. The public partner may provide limited funding or other benefits (such as tax exemptions) but the private organization accepts most of the risks.

The private organization is then granted the right to own, maintain and operate the project for a set period of time, during which they can draw fees from users of the asset. Once the time period has elapsed, the control of the project transfers to the public-sector partner, either freely or for a fee that is stipulated in the original contract. It is common for the time period to be several decades in the case of big infrastructure projects that carry a lot of construction and operational risk.

Advantages

- It minimizes the public cost for infrastructure development.
- It reduces public debt.

- It allows for innovation.
- It provides a chance to bring in expertise.
- It allows each party to focus on their strengths.
- It keeps public-sector funds where they are most needed.
- It is a process that is fully appraised.
- Completing project within time frame and planned budget.

Disadvantages

- It can have higher transaction costs.
- It only works for large projects.
- It requires fund-raising to be successful.
- It may require substantial operational revenues to be successful.
- It requires strong corporate governance.
- It can place the public sector at a disadvantage.

Engineering procurement and construction (EPC) contract

Many companies in the renewable energy industry and power sector commonly use Engineering, Procurement and Construction (EPC) contracts for complex infrastructure projects. This form of contract sets out the relationship between the owner and the contractor for the provision of professional or technical services. Under an EPC contract, the principal or owner enters into a contract with the EPC contractor, who will, in turn, enter into various subcontracts with subcontractors for the performance of specified portions of work. They will be responsible for not only the engineering aspects of the project, but also procurement of equipment and design and construction of the facility, plant or project. For owners of projects, EPC contracts allow them to manage risk more effectively and also allow contractors to allocate and specialize in the work they undertake. This model is used where the owner's concept design is based more on functionality and they need someone to engineer a solution to produce that functionality. Under common EPC agreements, contractors have full control of the design, procurement and construction of the project from inception to completion.

Many people refer to EPC contracts as turnkey construction contracts as it allows the owner to simply 'turn the key' when the project is complete for the system to be fully operational. In addition to delivering a complete facility or plant, contractors must also deliver it for a guaranteed price and date. This guarantee means that the contractor, and not the principal, will incur any additional costs. If the plant is not complete to the specified level upon completion, the contractor may also incur financial liability.

Engineering procurement, construction and financing (EPCF) contract

Now-a-days, various methods of international contracts in the power sector can be used by the companies and investors. According to the project finance problems in the power sector, it is necessary to identify the

new model contracts that can lead to more active participation of the private sector in the project finance. In this situation, the EPCF contract can be appropriate for solving the project finance problems. However, due to the lack of development of this contractual model, its implementation will be difficult and complicated. The wide diversity of activities in this method increases the management mistakes of contractor and this new method will cause legal and contractual deficiency; also, it will affect the determination of the rights and obligations of the parties and the implementation of this method.

Turnkey contract

A turnkey or a turnkey contract (also spelled turn-key) is a type of contract that is constructed so that it can be sold to any buyer as a completed product. This is contrasted with build to order, where the constructor builds an item to the buyer's exact specifications, or when an incomplete product is sold with the assumption that the buyer would complete it. An advantage of the Turnkey contract is that it is a way of obtaining a substantial economic profit from an asset.

A turnkey project or contract as described by *Duncan Wallace*"A contract where the essential design emanates from, or is supplied by, the contractor and not the owner, so that the legal responsibility for the design, suitability and performance of the work after completion will be madeto restwith the contractor." Turnkey' is treated as merely signifying the design responsibility as the contractor's.

Cost-reimbursement contract

A cost-reimbursement contract is a contract where a contractor is paid for all of its allowed expenses to a set limit, plus additional payment to allow for a profit. Cost-reimbursement contracts contrast with a fixed-price contract, in which the contractor is paid a negotiated amount regardless of incurred expenses. The cost-reimbursement contract is considered high risk for the government because of the potential for cost escalation and because the government pays a contractor's costs of performance regardless of whether the work is completed. As such, cost-reimbursement contracts are suitable only when the cost of the work to be done cannot be estimated with sufficient accuracy to use any type of fixed-price contract.

Cost plus contract

- Actual cost plus a negotiated reimbursement to cover overheads and profit.
- Different methods of reimbursement:
  - Cost + Percentage
  - Cost + Fixed fee
  - Cost + Fixed fee + Profit-sharing clause

- Higher risk to owner.
- Compromise: guaranteed maximum price (GMP) reduces risk to owner while maintain advantage of cost plus contract.
- By using this type of contract, the contractor can start work without a clearly defined project scope, since all costs will be reimbursed and a profit guaranteed.

Management contract

A management contract is an arrangement under which operational control of an enterprise is vested by contract in a separate enterprise that performs the necessary managerial functions in return for a fee. Management contracts involve not just selling a method of doing things (as with franchising or licensing) but involve actually doing them. A management contract can involve a wide range of functions, such as technical operation and of a production facility, management of personnel, accounting, marketing services and training.

Time and material rate contract

Time and materials is a standard phrase in a contract for construction, product development or any other piece of work in which the employer agrees to pay the contractor based upon the time spent by the contractor's employees and subcontractor's employees to perform the work, and for materials used in the construction (plus the contractor's mark up on the materials used), no matter how much work is required to complete construction. Time and materials is generally used in projects in which it is not possible to accurately estimate the size of the project, or when it is expected that the project requirements would most likely change. This is opposed to a fixed-price contract in which the owner agrees to pay the contractor a lump sum for fulfillment of the contract no matter what the contractors pay their employees, sub-contractors and suppliers. Many time and materials contracts also carry a guaranteed maximum price, which puts an upper limit on what the contractor may charge, but also allow the owner to pay a lesser amount if the job is completed more quickly.

4.3 TENDERING PROCEDURE

Following are the tendering procedure:

i) Preparation of tender documents.
ii) Issue of notice inviting tender or tender call notice.
iii) Submission and opening of tenders and their scrutiny.
iv) Acceptance of tender and award of contract.

4.3.1 Tender

It is an offer writing by the tenderer/owner (the person/firm who offers the tender) to execute some specified work or to supply some specified

new model contracts that can lead to more active participation of the private sector in the project finance. In this situation, the EPCF contract can be appropriate for solving the project finance problems. However, due to the lack of development of this contractual model, its implementation will be difficult and complicated. The wide diversity of activities in this method increases the management mistakes of contractor and this new method will cause legal and contractual deficiency; also, it will affect the determination of the rights and obligations of the parties and the implementation of this method.

Turnkey contract

A turnkey or a turnkey contract (also spelled turn-key) is a type of contract that is constructed so that it can be sold to any buyer as a completed product. This is contrasted with build to order, where the constructor builds an item to the buyer's exact specifications, or when an incomplete product is sold with the assumption that the buyer would complete it. An advantage of the Turnkey contract is that it is a way of obtaining a substantial economic profit from an asset.

A turnkey project or contract as described by *Duncan Wallace*"A contract where the essential design emanates from, or is supplied by, the contractor and not the owner, so that the legal responsibility for the design, suitability and performance of the work after completion will be madeto restwith the contractor." Turnkey' is treated as merely signifying the design responsibility as the contractor's.

Cost-reimbursement contract

A cost-reimbursement contract is a contract where a contractor is paid for all of its allowed expenses to a set limit, plus additional payment to allow for a profit. Cost-reimbursement contracts contrast with a fixed-price contract, in which the contractor is paid a negotiated amount regardless of incurred expenses. The cost-reimbursement contract is considered high risk for the government because of the potential for cost escalation and because the government pays a contractor's costs of performance regardless of whether the work is completed. As such, cost-reimbursement contracts are suitable only when the cost of the work to be done cannot be estimated with sufficient accuracy to use any type of fixed-price contract.

Cost plus contract

- Actual cost plus a negotiated reimbursement to cover overheads and profit.
- Different methods of reimbursement:
  - Cost + Percentage
  - Cost + Fixed fee
  - Cost + Fixed fee + Profit-sharing clause

- Higher risk to owner.
- Compromise: guaranteed maximum price (GMP) reduces risk to owner while maintain advantage of cost plus contract.
- By using this type of contract, the contractor can start work without a clearly defined project scope, since all costs will be reimbursed and a profit guaranteed.

Management contract

A management contract is an arrangement under which operational control of an enterprise is vested by contract in a separate enterprise that performs the necessary managerial functions in return for a fee. Management contracts involve not just selling a method of doing things (as with franchising or licensing) but involve actually doing them. A management contract can involve a wide range of functions, such as technical operation and of a production facility, management of personnel, accounting, marketing services and training.

Time and material rate contract

Time and materials is a standard phrase in a contract for construction, product development or any other piece of work in which the employer agrees to pay the contractor based upon the time spent by the contractor's employees and subcontractor's employees to perform the work, and for materials used in the construction (plus the contractor's mark up on the materials used), no matter how much work is required to complete construction. Time and materials is generally used in projects in which it is not possible to accurately estimate the size of the project, or when it is expected that the project requirements would most likely change. This is opposed to a fixed-price contract in which the owner agrees to pay the contractor a lump sum for fulfillment of the contract no matter what the contractors pay their employees, sub-contractors and suppliers. Many time and materials contracts also carry a guaranteed maximum price, which puts an upper limit on what the contractor may charge, but also allow the owner to pay a lesser amount if the job is completed more quickly.

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i) Preparation of tender documents.
ii) Issue of notice inviting tender or tender call notice.
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iv) Acceptance of tender and award of contract.

4.3.1 Tender

It is an offer writing by the tenderer/owner (the person/firm who offers the tender) to execute some specified work or to supply some specified

goods at certain rate/amount within stipulated time under certain conditions of agreement.

4.3.2 Tender Notice

It is the information inviting bids from competent and capable contractors/firms/service providers and forms a part of contract documents. Following are the information's to be given in the tender notice:

i) Name and address of the public entity inviting tender.
ii) Name and type of work and its location.
iii) Designation of officer inviting tender.
iv) Last date and time of receipt of tender.
v) Period of availability of tender document.
vi) Cost of tender document.
vii) Provision of e-bidding and its process.
viii) Provision, date and time of pre-bid meeting.
ix) The amount of bid security and its validity period.
x) Date, time and place of opening the tender.
xi) Designation of the officer opening the tender.

4.3.3 Preparation before inviting the tender

Following are the preparations before inviting the tender:

i) Preparation of project.
ii) Quantity estimation.
iii) Cost estimation.
iv) Approval of cost estimate from concern authority.
v) Resource planning.
vi) Tender documents preparation and approval.

4.3.4 Contract Document

When the tender of a contractor is accepted, an agreement between the contractor and the owner takes place and the documents defining the rights and obligations of the owner and the contractor are attached to the agreement bond and this is called a contract document. Each page of the contract document bears the signature of the contractor and the accepting authority and any correction in it is initialed.

The contract document must contain:

- Title page : name of work, name of owner, name of contractor, contract agreement no., contents, etc.
- Index page : contents of the agreement with reference pages
- Tender notice : brief description of work, estimated cost of work, date and time of receiving tender, amount of earnest money deposit and security deposit, time of completion, etc.
- Tender form : the bill of quantities, contractor's rate, total cost of work, time of completion, amount of security deposit, etc.
- Schedule of issue of materials : list of materials to be issued by the owner/department to the contractor with the rates and place of issue.
- Drawings : complete set of drawings including plan, elevation, sections, detailed drawings, etc. all fully dimensioned.
- Specifications : a) General specifications which specify the class and type of work, quality of materials, etc.
  b) Detailed specifications- detailed description of each item of work including material and method to be used along with the quality of workmanship required.
- Conditions of contract

Following are the priority forming the contract document:

i) Contract agreement
ii) Letter of acceptance
iii) Contractor's bid
iv) Special condition of contract
v) General condition of contract
vi) Specifications
vii) Drawings
viii) Bill of Quantities
ix) Addenda

General Condition of Contract (GCC)

Following are the general condition of the contract:

- Rates of each item of work inclusive of materials, labour, transport, plant/equipment and other arrangements required for completion of work.
- Amount and form of earnest money and security deposit.
- Mode of payment to contractor including running payment, final payment and refund of security money, etc.
- Time of completion of work.

- Extension of time for completion of work.
- Engagement of sub-contractor and other agencies at contractor's cost and risk.
- Penalty for poor quality and unsatisfactory work progress.
- Termination of contract.
- Arbitration for settlement of disputes.

Special Condition of Contract

Special conditions depending upon the nature of work taxes and royalties included in the rates, labour camp, labour amenities, compensation to labour in case of accidents, etc.

4.4 CONTRACT AGREEMENT

A negotiated and usually legally enforceable understanding between two or more legally competent parties. Although a binding contract can (and often does) result from an agreement, an agreement typically documents the give-and-take of a negotiated settlement and a contract specifies the minimum acceptable standard of performance.

Why is a contract agreement important?

A contract agreement is a really important document that will define your scope of work and that will bind the owner to your services, including the payment terms. It is really important that you understand the scope of work specified in the contract agreement, complete the work as scheduled, invoice per instructed to do so and finally it will be the tool used so you can get paid.

However, contract agreements must:

- Be in writing.
- Contain a description of the product or service being offered.
- Be understood and clear between both parties.
- Include services being contracted clearly.
- Include cancellation or termination policy.
- Have financial terms clear.

Contract Agreement Types

Contract agreements vary or could have several modifications depending on the contract being executed. *For example;*

Express : This type of agreement defines very well the purpose and scope of the agreement. Under this alternative, the stipulations and terms of the contract are understood clearly by each part.

Executed : An executed contract agreement provides a warranty period or malfunction. Under this agreement, services have been rendered, but the contract protects one party when the other's performance fails to provide the proper warranty for defective or incorrect installation.

Conditional: A conditional contract agreement is an agreement used when services could not be provided at the time the contract was signed. It stipulates a future date when services will be rendered if certain conditions are met.

4.5 MISCELLANEOUS TERMS

4.5.1 Prequalification

Screening of potential contractors, suppliers, or vendors (on the basis of factors such as experience, financial ability, managerial ability, reputation, work history, etc.) to develop a list of qualified bidders who will receive the invitation-to-bid (ITB) documents is called prequalification.

Advantages of prequalification

The prequalification process may be of benefit to both bidders and the Employer alike, in that:

- The process enables prospective bidders, who may be insufficiently qualified on their own, to avoid the expense of bidding, or to form a joint venture that may give a better chance of success.
- Prequalification, well-qualified firms will price their bids with the knowledge that they are competing with other qualified bidders meeting realistic minimum competence criteria; the assurance that inadequately qualified competitors will be excluded from submitting unrealistically low bids encourages leading contractors to bid.
- Prequalification enables the Employer to assess the interest from qualified firms generated by the contract and, in the event that only a limited number of applications are received, to make any necessary adjustments in the procurement process (including, in particular, the special conditions of contract—sharing of risk, payment terms, liquidated damages, or completion times, which may be perceived as onerous by potential bidders).
- It helps to expose potential conflicts of interest by identifying contractors who may have a business association with consultants to the project.
- It reduces the amount of work and time involved by the Employer in evaluating bids from unqualified contractors.
- It encourages local firms to form joint ventures with other local or international firms, thereby benefiting from their resources and experience;
- It enables the employer to assess the likelihood of contractors' eligibility for domestic bidder price preference;
- It reduces significantly, if not eliminates, problems of rejection associated with low-priced bids submitted by bidders of doubtful capability.

- Donor agencies some indication of the employer's ability to manage an important, early procurement function.

Disadvantages of prequalification

On the negative side, prequalification has some potential disadvantages:

- It may increase procurement lead time, although this can be minimized by good procurement scheduling, For example:, undertaking the prequalification process while bid documents are being prepared.
- The Employer is required to review all prequalification applications, whereas post qualification requires the review of the qualifications of, normally, only one (the lowest evaluated) bidder.
- Collusion (and the possibility of price-rigging) is easier among a limited number of identified bidders, particularly if they are of the same nationality.
- The element of subjective judgment required by evaluators when applying the prequalification criteria to a number of Applicants, and the discretionary rights reserved to the Employer, provide opportunities for externally influenced deviations from the expected high standards of ethics and impartiality in prequalifying applicants.
- Donor Agencies, from their own experiences, believe that on balance the benefits of prequalification under transparent conditions for large Works contracts outweigh by a considerable margin the potential disadvantages, for both GN and the construction community alike.

4.5.2 Liquidated Damages

Sum of money (agreed-to and written into a contract) specified as the total amount of compensation an aggrieved party should get, if the other party breaches certain part(s) of the contract. The contract also establishes what actions or failures to act constitute a breach. For the agreement to be legally enforceable, the nature of the contract should be such that it is difficult to determine actual damages, and the amount of damages should be reasonable under the circumstances. Otherwise law may regard the specified amount as a fine (included in the contract primarily to force its proper performance) and not a compensation for injury. The amount of liquidate damages is 0.05% of the contract price per day but not exceeding 10% of the contract price.

4.5.3 Provisional Sum

An amount of money tentatively agreed upon between two parties contracting for work to be performed; in cases in which the full extent or nature of the work is not yet known. Determining a provisional sum allows work to proceed, with the expectation that the amount may be modified in the course of the work as more information about the scope of the work becomes available.

4.5.4 Pre-bid Meeting

Pre-bid meetings are usually held, if previously mentioned in the solicitation documents, during the bid/proposal preparation period. Their purpose is to clarify any concerns bidders may have with the solicitation documents, scope of work and other details of the requirement. These meetings are formal and the results are made available in writing to all prospective bidders that registered interest in the requirement, be it through requesting, buying or downloading the solicitation documents from an official website. Prospective bidders are permitted to request clarifications by a date and time stipulated in the solicitation documents. It is most beneficial to hold pre-bid meetings prior to formally responding to the request for clarifications, that way the responses to the request for clarifications can be sent along with the results of the pre-bid meeting, including a copy of the minutes of the pre-bid meeting.

Although prospective bidders should be encouraged to get as much information as possible (including visiting the site) on a specific or upcoming requirement of a procuring entity, formal site visits are usually planned and carried out for works procurement and more complex goods requirements. When a site visit is planned, the details of the date and time must be stated in the solicitation documents. And the site visit should take place before (but not too far in advance of) the pre-bid meeting. The results are also formally sent to all prospective bidders that expressed interest in the requirement, by way of minutes of the site visit and pre-bid meeting, including consolidated responses to request for clarifications, also from prospective bidders. The pre-bid meeting is usually open to all interested prospective bidders; however, in cases where pre-qualification or short-listing is carried out, only pre-qualified or short-listed bidders are invited to attend the pre-bid meeting.

Site visits, as mentioned above, can and should preferable be held prior to the pre-bid meeting. The reason for this preference is because after the site visit, bidders may have additional queries and these can be addressed at the pre-bid meeting and formally sent (with the minutes) to all prospective bidders that expressed interest in the requirement, or those that were short-listed through a pre-qualification exercise or restricted bidding process. The time and venue of these meetings are addressed in the solicitation documents, and attendance is usually not obligatory. During the site visit the prospective bidders survey the site and ask questions to clarify any doubts or information provided in the solicitation documents. Sometimes, as a result of the site visit/pre-bid meeting there

might be a need to extend the bid/proposal submission date by way of Addendum to the solicitation documents to give bidders sufficient time to address any changes made to the solicitation documents as a result of the site visit and/or pre-bid meeting.

4.5.5 FIDIC

The International Federation of Consulting Engineers (commonly known as FIDIC, acronym for its French name Fédération Internationale Des Ingénieurs-Conseils) is an international standards organization for the consulting engineering and construction best known for the FIDIC family of contract templates. The fact that the organization has a French title bear's testimony to its foundation in 1913 by three wholly or partly francophone countries, Belgium, France and Switzerland. Today FIDIC has members in 104 countries. FIDIC aims to represent globally the consulting engineering field by promoting the interests of firms/engineers supplying technology-based intellectual services for the built and natural environment. Run mostly by volunteers, FIDIC is well known in the consulting engineering field for its work in defining conditions of contract for the construction industry worldwide.

4.5.6 Methods of Recruitment of Consultants

Following are the methods of recruitment of consultant:

i) Quality and cost based selection (QCBS)
ii) Least cost based selection (LCBS)
iii) Quality based selection (QCB)
iv) Fixed budget selection (FBS)
v) Single source selection (SSS)
vi) Consultants qualification selection (CQS)

4.6 EXAM SOLUTION

1. **Elaborate the differences between void and voidable contract. Explain briefly about general conditions of contract and its essential contents.** [2069 Bhadra; W: 2+3]

Ans: See the definition part 4.2.2 and 4.3.4

2. **Write short notes on: Benefits of prequalification** [2069 Bhadra; W: 2.5]

Ans: See the definition part 4.5.1

3. **Define tender. Explain the purpose of tender. List the essentials information to be contained in the tender notice.** [2070 Bhadra; W: 5]

Ans: See the definition part 4.3.1 and 4.3.2

4. **Describe briefly the elements of contract.** [2071 Bhadra; W: 4]

Ans: See the definition part 4.2.1

5. **Define tender. What is the essential information to be given in the tender notice?** [2071 Bhadra; W: 4]

Ans: See the definition part 4.3.1 and 4.3.2

6. **Define contract document. What are the priorities of contract document? Explain the rules of contract interpretation.** [2071 Magh; W: 4]

Ans: See the definition part 4.3.4

7. **What is contract? Explain tendering process and contract agreement. Describe essential elements of contract.** [2072 Ashwin; W: 8]

Ans: See the definition part 4.2.1 and 4.3 and 4.4

8. **Write short notes on: Tender** [2072 Magh; W: 2.5]

Ans: See the definition part 4.3.1

9. **What are the preparations to be made before inviting competitive bidding notice? How the contract can be interpreted in case of ambiguity? Define percentage contract and in which category of procurement, this form of contract is adopted?** [2073 Bhadra; W: 4]

Ans: See the definition part 4.3.3 and 4.2.3

10. **What do you understand by tendering? Why is the all services required tendering in government sector.** [2073 Magh; W: 4]

Ans: See the definition part 4.3.1

11. Write short notes on: General condition of contract [2073 Magh; W: 2]

Ans: See the definition part 4.3.4

12. Define contract. What are the essential elements in the valid contract? [2074 Bhadra; W: 5]

Ans: See the definition part 4.2.1

13. What are the methods of recruitment of consultant? Explain the purposes of EOI and RFP. [2074 Bhadra; W: 5]

Ans: See the definition part 4.5.6

14. What is contract document? What are the essential elements of contract? Explain. [2075 Bhadra, W: 1+3+4]

Ans: **For the first part**
See the definition part 4.3.4

For the second part
See the definition part 4.2.1

15. Define tender. What are the essential elements of valid contract? [2075 Magh]

Ans: **For the first part**
See the definition part 4.3.1

For the second part
See the definition part 4.2.1

16. Describe brief the methods of contracting. [2076 Bhadra, W: 4]

Ans: See the definition part 4.2.3 (Types of contracts in terms of nature of work in construction work)

17. What is the information that you need to provide in the Tender notice? [2076 Bhadra, W: 4]

Ans: See the definition part 4.3.2

18. What is contract? Describe briefly the elements of contract. [2077 Chaitra; W: 2+2]

Ans: See the definition part 4.2.1

19. Define tender and tender notice. Discuss the procedure of tendering. [2077 Chaitra; W: 2+2]

Ans: **For the first part**
See the definition part 4.3.1 and 4.3.2

For the second part
See the definition part 4.3

20. Define contract. What are the essential elements of contract? In which condition contract will be void? [2078 Chaitra; W: 4]

Ans: **For the first and second part**
See the definition part 4.2.1

For the third part
Contract will be void under the following conditions:

i) If the contract is against the existing law and public welfare.
ii) If the subject matter of a contract is unclear to give meaning.
iii) If the contract is found not possible to perform from the time of entering into contract.
iv) If the contract has false representation of facts.
v) If there is miscommunication around the agreement by either party in a contract.

21. Describe about the tender and explain the purpose of tender. List the essential information to be enclosed in the tender notice while publishing for public purpose. [2078 Chaitra; W: 4]

Ans: **For the first part**
See the definition part 4.3.1

For the second part
Purpose of tender

i) To use the fund for intended purpose or project implementation.
ii) To give an equal opportunity to compete for eligible bidders.
iii) To encourage for the development of domestic contracting and manufacturing industries.
iv) To bring transparency in all stages of procurement process.
v) To observe economic and efficient project.

For the third part
See the definition part 4.3.2

22. Write the information required to provide in a tender notice. [2079 Jestha; W: 5]

Ans: See the definition part 4.3.2

Chapter 5

REGULATORY ENVIRONMENT

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5.1 NEPAL ENGINEERING COUNCIL ACT

Whereas, it is expedient to provide for the Nepal Engineering council in order to make the engineering profession effective in Nepal and mobilize it in a systematic and scientific manner and also to provide for, *inter alia*, the registration of the names of engineers according to their qualification;

Now, therefore, be it enacted by Parliament in the Twenty-Seventh year of the reign of His Majesty King Birendra Bir Bikram Shah Dev.

Chapter 1
Preliminary

1. Short title and commencement

1. This Act may be called as the "Nepal Engineering council Act 2055 (1999)."

2. This Act shall come into force on such date as the Government of Nepal may appoint, by publishing a Notification in the Nepal Gazette.

2. Definitions

Unless the subject or the context otherwise requires, in this Act,

a) "Council" means the Nepal Engineering council established pursuant to Section 3.

b) "Chairperson" means the chairperson of the council.

c) "Member" means the member of the council, and this term also includes the chairperson and member-secretary of the council.

d) "Engineer" means a person who holds at least Bachelor's Degree in an engineering subject from an academic institution recognized by the council.

e) "Engineering profession" means the profession to be practiced by the engineers who have acquired technical knowledge and skills in the subjects as referred to in the Schedule.

f) "Register" means the register prepared pursuant to Section 15.

g) "Registered engineer" means an engineer whose name has been registered in the register.

h) "Registrar" means the person appointed pursuant to Section 27.

i) "Subject committee" means the subject committee constituted pursuant to Section 32.

j) "Prescribed" or "as prescribed" means prescribed or as prescribed in the Rules made under this Act.

Chapter 2
Establishment, constitution, functions, duties and powers of the council

3. Establishment of Nepal engineering council

The Nepal Engineering council is hereby established in order to mobilize the engineering profession in a systematic and scientific manner by making it effective, as well as to make provisions for, *inter alia*, the registration of the names of engineers according to their qualifications.

4. Council to be an autonomous body

1. The council shall be an autonomous body corporate with perpetual succession.
2. The council shall have a separate seal of its own for all of its activities.
3. The council may, like an individual, acquire, use, own, sell or otherwise deal with any movable and immovable properties.
4. The council may, like an individual, sue or be sued by its name.

5. Composition of the council

1. The council established pursuant to Section 3 shall consist of the following members:
   a) An engineer nominated by the Government of Nepal from amongst the engineers who have at least fifteen years' of experience in the engineering profession after having obtained a bachelor's degree in engineering–chairperson.
   b) An engineer nominated by the Government of Nepal from amongst the engineers who have at least ten years' of experience in the engineering profession after having obtained a bachelor's degree in engineering-Vice-chairperson.
   c) Five engineers nominated by the Government of Nepal from amongst the engineers engaged in engineering profession member–Member.
   d) President, Nepal Engineers Association–Member.
   e) Five engineers elected by Nepal Engineers–Member.
   f) One Campus Chief nominated by the Government of Nepal from amongst the Campus Chiefs of Engineering Colleges–Member.
   g) Representative, Institute of Engineering, Tribhuvan University–Member.
   h) Two engineers nominated by the council–Member
   i) Registrar –Member Secretary
2. While making the nomination and conducting election of members in accordance with Clauses (c) and (e) of the Sub-section (1), such nomination and election shall be made or conducted from separate subjects of the engineering profession on the subject–wise basis.
3. Until election is held for the members as referred to in Clause (e) of Sub–section (1), the engineers nominated by the Nepal Engineers Association shall be the member s of the council.
4. While making nomination for the representative in accordance with Clause (g) of Sub–section (1), such nomination shall be made from amongst the engineers.
5. The council may, if it deems so necessary, invite any expert to participate in its meetings.

6. Tenure of office of members

1. The tenure of office of the members nominated or elected to the council shall be Four years. The members whose term of office has expired may be re–nominated or re–elected, subject to the other provisions contained in this Act.

2. If the office of a member falls vacant prior to the expiry of the term of office, the office so fallen vacant shall be filled through nomination or election of another member for the remainder of the term.

7. Disqualification for being member

Any of the following persons shall not be eligible to be nominated or elected to the office of member of the council:

a) A non–Nepalese citizen.
b) A person whose name has been removed from the register.
c) A person who has become insolvent upon being unable to repay loans of creditors.
d) A person who has been punished by a court upon being convicted in a criminal charge involving moral turpitude.
e) A person who is of unsound mind.

8. Circumstances where membership terminates

The membership of the council shall be deemed to have been terminated in any of the following circumstances:

a) If the member is disqualified under Section 7.
b) If the resignation tendered from the office of member is accepted.
c) If the member, without giving a prior notice with the reasons to the council, absents himself or herself from three consecutive meetings of the council.
d) If the member dies.

9. Functions, duties and powers of the council

The functions, duties and powers of the council shall be as follows, in addition to the functions, duties and powers set forth elsewhere in this Act:

a) To prepare and implement policies, plans and programmes as required for carrying out the engineering profession in a proper manner.
b) To recognize, as prescribed, academic institutions providing engineering education, and certificates and degrees granted by such institutions.
c) To determine requisite qualifications for practicing the engineering profession and to register as prescribed with the council the names of persons having possessed the specified qualifications.
d) If a registered engineer violates the professional code of conduct as prescribed or does not comply with it, to remove the name of such an engineer from the council by fulfilling the procedures as prescribed.

10. Meetings and decisions of the council

1. The meetings of the council shall generally be held Four times a year. Provided that, the Chairman may, if he or she so desires, convene the meeting for more than the said times.
2. The meetings of the council shall be held at such time and venue as may be specified by the chairperson.
3. The presence of more than fifty percent members of the total number of members of the council shall be deemed to constitute a quorum for the meeting of the council.
4. The chairperson shall preside over the meeting of the council and, in his or her absence; the vice-chairperson shall preside over it. In the absence of both chairman and vice-chairman, the person selected by the members present in the meeting from among themselves shall preside over the meeting.
5. The opinion of majority shall be binding in the meeting of the council, and in the event of a tie, the person presiding over the meeting may exercise the casting vote.
6. The decisions of the council shall be authenticated by the member-secretary.
7. Other procedures relating to the meetings of the council shall be as determined by the council itself.

Chapter 3

Provisions relating to the registration of name

11. Prohibition of practicing engineering profession without registering name

After one year from the date of commencement of this act, no person shall practice the engineering profession without getting his or her name registered with the council.

12. Application to be made for registration of name

1. Any person wishing to register his or her name with the council shall make an application to the council in such a format as prescribed.
2. The persons who are practicing the engineering profession at the time of commencement of this Act shall make an application in accordance with sub-section (1) within six months from the date of commencement of this Act for the purpose of getting registered their names with the council.
3. The persons making an application in accordance with sub-section (1) or (2) to get registered their names shall have to attach the certificates, degrees and other documents related thereto obtained from academic institutions as well as the fees as prescribed with the application.

13. Inquiry into application

The registrar shall carry out necessary inquiry into an application made pursuant to Section 12 and submit it to the concerned subject committee.

14. Examination of and recommendation on application

1. The subject committee shall conduct necessary examination of application submitted by the registrar pursuant to section 13.
2. If any matter appeared to be unclear in conducting examination pursuant to sub-section (1), the subject committee may demand necessary evidence and documents from the concerned applicant in order to make clear the matters related thereto.
3. It shall be the duty of the concerned applicant to submit to the subject committee the evidence and documents demanded pursuant to sub-section (2).
4. If the subject committee finds that the name of the applicant is being eligible to be registered with the council upon conducting an examination in accordance with sub-sections (1), (2) and (3), it shall make a recommendation to the council for such registration.

15. Registration of name

If the council considers it appropriate to register with the council the name of an applicant recommended by the subject committee for the registration of name after having conducted necessary examination in accordance with section 14, it shall decide to register the name of such an applicant in the register of the council prepared in such a format as prescribed.

16. Name registration certificate to be issued

The Registrar shall make registration in the register of the name of an applicant in respect of whom a decision has been made to register the name by the council pursuant to section 15, and shall issue the name registration certificate to the applicant in such a format as prescribed.

17. Information to be given if decision is made not to register name

If the council finds any reason which makes it inappropriate to register the name of any applicant who has made an application for the registration of name with the council and decides not to register the name, the Registrar shall have to give the information thereof in writing to the concerned applicant.

18. Name to be removed from register

1. Except in any of the following circumstances, the name of a registered engineer shall not be removed from the register.

a) If he or she becomes mentally unsound.
b) If he or she becomes insolvent upon being unable to repay loans of creditors.
c) If a resolution submitted to a meeting of the council to remove his or her name from the register on the charge of violation of the professional code of conduct as prescribed is passed by a two-thirds majority.
d) If he or she is punished by a court upon being convicted in a criminal charge involving moral turpitude.
e) If he or she does not possess the qualification but his or her name has been registered by fraud or mistake.

2. Prior to submitting a resolution to remove the name of a registered engineer from the register on a charge as referred to in clauses (c) and (e) of sub-section (1) to a meeting of the council, the council shall constitute an inquiry committee to submit a report after having conducted inquiries into the charge made against such a person.
3. The procedures to be followed by the inquiry committee constituted pursuant to sub-section (2) in conducting inquiries shall be as prescribed.

19. Certificate to be cancelled

In cases where the council makes a decision to remove the name from the register pursuant to Section 18, the Registrar shall have to remove the name of such a person from the register, cancel the name registration certificate issued pursuant to Section 16 and give information thereof to the concerned person.

20. Name to be registered again

1. If a decision is made to remove the name from the register on the occurrence of the circumstances as referred to in Clauses (a), (b) and (c) of sub-section (1) of section 18, the concerned person may after a period of at least One year from the date on which such decision for removal is made, make an application to the council in accordance with section 12, with specifying reasonable reasons for re-registration of the name.
2. Where an application is made for the re-registration of name in accordance with sub-section (1), the council may, if it considers it reasonable to re-register the name of such an applicant, decide to re-register the name accordingly.
3. Where the council decides to re-register the name of an applicant in accordance with sub-section (2), the registrar shall re-register the name of such an applicant in the register and issue a certificate of the re-registration of name to the applicant in such a format as prescribed.

Chapter 4

Recognition of certificates of academic qualification or degree

21. Recognition of certificates of academic qualification or degree

1. The council shall recognize the certificates of academic qualification or degree in engineering granted by any academic institute.
2. The names of the certificates of academic qualification or degrees recognized by the council pursuant to sub-section (1) and the names of the academic institutes granting such certificates or degrees shall be published in the Nepal Gazette.

22. Power to demand details

1. In course of recognizing the certificate of any academic qualification or degree in accordance with section 21, the council may demand the set curriculum for such certificate of academic qualification or degree and the specified terms and conditions for admission as well as other details related thereto from the concerned academic institute.
2. It shall be the duty of the concerned academic institute to make available the necessary details as demanded by the council in accordance with sub-section (1).

23. Inspection of examination

1. In course of recognizing the certificate of any academic qualification or degree pursuant to section 21 or after granting such recognition, the council may appoint and send an inspector to carry out inspection in regard to the system of examination to be conducted by the concerned academic institute granting the said certificate of academic qualification or degree.
2. The inspector sent pursuant to sub-section (1) shall not be entitled to interfere in any manner with the examination in the course of carrying out inspection.
3. The inspector carrying out the inspection of examination pursuant to sub-section (2) shall prepare a report on the matters found by him or her in the course of carrying out the inspection of examination and submit such a report to council.

24. Withdrawal of recognition

1. Considering the details received in accordance with section 22 from the concerned academic institute in respect of the certificate of any academic qualification or degree to which the recognition is granted pursuant to section 21 or the report received in accordance with sub-section (3) of section 23, if the council is of the opinion that the curriculum, conditions

for admission and the examination system set by such an academic institute are not appropriate and sufficient, it shall submit its report in this respect to the Government of Nepal.

2. The government of Nepal may, upon receipt of the report of the council pursuant to sub-section (1), seek clarification in that respect from the concerned institute.
3. The government of Nepal shall consider the clarification submitted and received as sought from the concerned academic institute pursuant to sub-section (2) and may make necessary inquiry, if any such inquiry is required to be made into any other matter in that respect; and the Government of Nepal may, on the basis of such inquiry as well, withdraw the recognition of the certificate of any academic qualification or degree granted by such an academic institute on and after any specific date.
4. A notice of the withdrawal of recognition of the certificate of any academic qualification or degree pursuant to sub-section (3) shall be published in the Nepal Gazette.

Chapter 5

Functions, duties and powers of chairperson, vice-chairman and registrar

25. Functions, duties and powers of chairperson

The functions, duties and powers of the chairperson shall be as follows, in addition to the functions, duties and powers set forth elsewhere in this Act:

a) To determine the priority of the matters to be discussed in the meeting of the council.
b) To monitor and evaluate, or cause to be monitored or evaluated the plans and programmes being carried out by the council and to give necessary directions in that respect.
c) To carry out, or cause to be carried out, the business and transactions of the council in a systematic, effective and proper manner.
d) To perform such other functions as prescribed.

26. Functions, duties and powers of vice-chairperson

It shall be the duty of the vice-chairperson, in the absence of the chairperson, to perform or exercise such functions, duties and powers as required to be performed or exercised by the chairperson under this Act.

27. Appointment, and functions, duties and powers of registrar

1. The government of Nepal may appoint the registrar of the council from amongst the persons who have possessed the qualifications required for registration of name with council.

2. The functions, duties and powers of the registrar shall be as follows, in addition to the functions, duties and powers set forth elsewhere in this Act:
   a) To carry out the business of general administration and management of the council.
   b) To make, or cause to be made arrangements for the supervision and control of the fund and for the management and taking care of, as well as for the repair and maintenance of, the assets of the council.
   c) To formulate annual programmes and plans of the council and submit them to the council.
   d) To prepare statements of annual income and expenditure and of supplementary income and expenditure of the council.
   e) To implement the budget, plans and programmes approved by the council.
   f) To make arrangements for the carrying out of internal and final audit of the council.
   g) To act as a liaison officer between the council and the engineers.
   h) To carry out, or cause to be carried out, such other functions as may be directed by the council.
   i) To carry out such other functions as may be prescribed.

Chapter 6

Fund of council

28. Fund of the council

1. The council shall have a separate fund of its own.
2. The fund as referred to in sub-section (1) shall consist of the following amounts:
   a) Amounts received from the government of Nepal.
   a) Amounts received as loans, donation, assistance, grants or gifts from any native or foreign individual, institution, government or international association or organization.
   b) Amounts received in consideration for the services provided by the council.
   c) Amounts received from any other source.
3. The council shall obtain prior approval of the government of Nepal prior to receiving any loan, donation, assistance, grant or gift from any foreign individual, institution, government or international association or organization pursuant to clause (b) of sub-section (2).

4. Amounts received by the fund of the council shall be deposited in a bank account to be opened with any commercial bank.
5. The operation of the fund and account of the council shall be as prescribed.

29. Accounts and audit

1. The accounts of income and expenditure of the council shall be maintained as prescribed.
2. The audit of the council shall be carried out as prescribed.
3. The Government of Nepal may, if it so desires, examine, or cause to be examined, the book of accounts of the council.

Chapter 7

Miscellaneous

30. Offences and punishment

1. If any person practices the engineering profession without getting his or her name registered with the council pursuant to section 11, he or she shall be deemed to have committed an offence as referred to in this act.
2. The person who commits an offence referred to in sub-section (1) may be liable to the punishment of a fine up to three thousand rupees or of imprisonment up to three months or both.
3. Except as provided for in sub-section (2), any person who commits any act violating this Act or Rules framed under this Act shall be liable to the punishment of a fine up to two thousand rupees.

31. Dissolution of the council

1. If the government of Nepal thinks that the council has failed to exercise the powers conferred to it by this Act or the Rules framed under this Act or abused the powers or exercised the powers exceeding those conferred to it or failed to perform the duties required to be performed by the council pursuant to this act or the rules framed under this act, the government of Nepal may dissolve the council.
2. After the dissolution of the council pursuant to sub-section (1), the government of Nepal shall take under its custody the fund and assets of the council and may carry out all the activities to be carried out by the council under this Act or the Rules framed under this act pending the constitution of another council, or may form a committee and cause such committee to carry out the said activities.

3. The government of Nepal shall constitute another council pursuant to section 5 generally within Three Months from the date of dissolution of the council pursuant to sub-section (1).
4. Subsequent to the constitution of another council pursuant to sub-section (3), the government of Nepal shall hand over the fund and assets taken by it under its custody in accordance with sub-section (2) to the said council.

32. Thematic committees and other committees may be constituted

1. The council may constitute such thematic committees and other committees as may be required.
2. The functions, duties and powers of the thematic committees and other committees constituted pursuant to sub-section (1) shall be as prescribed by the council.

33. Meeting allowance and other facilities of members

The meeting allowance and other facilities of the members and of the members of the thematic committees and other committees constituted pursuant to section 32 shall be as prescribed.

34. Employees of the council

1. The council may appoint such employees as may be required.
2. The terms and conditions of service and facilities of the employees appointed in accordance with sub-section (1) shall be as prescribed by the Bye-laws.

35. Authority to carry out inquiry and investigation and to institute cases

The authority or body to carry out the inquiry and investigation of the offences referred to in section 30 and to institute cases, and procedures related thereto shall be as prescribed by the government of Nepal, by publishing a notification in the Nepal Gazette.

36. Liaison with the Government of Nepal

Ministry of works and transport shall liaison the council with the government of Nepal.

37. Power to frame rules and Bye-laws

1. The council may frame necessary rules in order to implement the objects of this act; and the rules so framed shall come into force only after they are approved by the government of Nepal.
2. The council may frame necessary Bylaws in such a manner as not to be contrary to this act and the rules framed pursuant to sub-rule (1).

38. Alteration in schedule

The government of Nepal may add engineering subjects as required, to the schedule, by publishing a notification in the Nepal Gazette.

Schedule

(Relating to Clause (e) of Section 2)

Engineering profession

1. Civil engineering
   a) General
   b) Highway
   c) Sanitary
   d) Building and architect
   e) Irrigation
   f) Hydrology
   g) Hydro-power
   h) Airport
2. Electrical
   a) General electrical
   b) Aviation electrical
3. Electronic and communication
4. Mechanical
   a) General mechanical
   b) Aviation mechanical
   c) Construction equipment maintenance
   d) Production engineering
5. Aeronautical
6. Mining
7. Chemical
8. Metallurgical
9. Metrology
10. Meteorology
11. Geology
    a) General
    b) Hydro-geology
    c) Engineering geology
12. Civil aviation operation and engineering
    a) Civil aviation operation
    b) Flight operation
    c) Aviation fire services
13. Survey
14. Chemistry
15. Agri-irrigation engineering
16. Textile engineering
    Electronics and computer science
17. Computer engineering
18. Environmental engineering
19. Automobile engineering

20. Industrial engineering
    Industrial and production engineering
21. Radio engineering
22. System engineering
23. Automation engineering
24. Bachelor of urban and physical planning
25. Geo technical engineering
26. Forestry engineering
27. Agricultural engineering
28. Energy engineering
29. Information technology and tele-communication engineering
30. Earthquake engineering
31. Architect engineering
32. Electrical and electronics engineering
    Electronics and power
33. Electronic engineering
    Electronics and instrumentation
34. Avionics engineering
35. Manufacturing science and engineering
36. Electronics and tele-communication engineering
37. Sound and video engineering
    Sound engineering
38. Industrial electronics engineering
39. Software engineering
40. Instrumentation engineering
41. Information technology
    Information science and engineering
42. Bio Medical engineering

5.2 LABOUR LAW

The labor act, 2017 (2074) ("new labor act") was passed by the parliament on August 11, 2017 (Shrawan 27, 2074) and accorded the assent by the president on September 04, 2017 (2074-05-19). The new labor act is now effective from the date of assent by the president by virtue of section 3 (f) of the interpretation of statute act, 1953 (2010). The new labor act has repealed the labor act 1992 (2048) (the "previous act"). The new labor act has brought complete change in employment regime in Nepal. The major provisions of the new labor act are briefly outlined below.

I) Applicability of the new labor act

Definition of Entity

The New Labor Act is applicable to entity, which has been defined to include company, private firm, partnership firm, cooperatives, association or other organization ("entity") in operation, or established, incorporated,

registered or formed under prevailing laws to undertake industry or business or provide service with or without profit motive.

Head Count Threshold

The new labor act has removed the head count requirement for applicability. The new labor act is applicable to all entities regardless of number of labors (worker/employees). Previous act was applicable only to entity where ten (10) or more people engaged in the work. However, the threshold of head count continues for certain arrangements to be made in the entity such as an entity having ten (10) or more workers should constitute a collective bargaining committee, labor relations committee, etc.

Entity Registered in Foreign Country

The new labor act has made provisions in relation to settlement of dispute with the entity registered in foreign country however, undertaking sales and market activities in Nepal through representative or hiring labor in Nepal. In accordance with the new labor act the representative or the labor hired by the foreign entity may file complaint before labor office or labor court if such entity violates the terms and conditions of the employment agreement.

Domestic Workers

The new labor act also deals with domestic workers. The new labor act has made certain provisions relating to domestic workers. *For example*; the New Labor Act provides that the minimum remuneration of such workers, public and weekly holidays should be as prescribed. The employer can deduct the expenses incurred in providing food and lodging from the remuneration if such is provided. Domestic workers should be allowed to celebrate festivals as per their culture, religion, tradition.

Exempted Entity

The new labor act is not applicable to civil service, armed force etc. It is also not applicable to entities incorporated under other prevailing laws or special economic zone, provided that terms and conditions of services in those entities have been covered in other prevailing laws. The working journalists are also not governed by the new labor act, unless the employment contract specifically provides for the applicability of the new labor act. The new labor act does not specifically provide its application to the persons working with the foreign diplomatic missions. The foreign missions are exempt from local laws and jurisdiction which of course may be extended to the employment matters in Nepal.

(ii) Hiring employees

The new labor act has provided flexibility in hiring providing different modes of hiring as per the requirement of the entity:

Regular Employment

The person hired for the work or service other than work based, time bound, casual or piece rate employment.

Work Based Employment

The person hired for carrying out specific work or rendering specific service.

Time bound Employment

The person hired for carrying out work or rendering service for definite period.

Casual Employment

The person hired to carry out the work or rendering service for seven or less days in a month.

Part-time Employment

The person who is hired in such a manner that he works for 35 hours or less in a week. The Part-time worker cannot be restricted to work in other places. The remuneration of such part time worker shall be on the basis of the hours he/she works unless otherwise provided in the employment agreement. The remuneration shall be determined on the basis of remuneration of regular employee engaged in similar work. The part time worker shall be entitled to social security benefits.

Intern

The new labor act has introduced the concept of intern according to which any person may be allowed to work as intern pursuant to the approved syllabus of any educational institution after concluding the agreement with that educational institution. The interns shall not be engaged at work exceeding 8 hours a day and 48 hours a week. Interns are entitled to health and safety arrangements, and to medical expenses and compensation in case of injury at work. The intern shall be deemed regular employee if engaged in work other than prescribed in.

Trainees

The new labor act also covers the trainees engaged in a work. The employer may also appoint a trainee to work, provided that the training period should not exceed more than a year. However, training for specialized work whose time period has been assigned by law is not regulated by this provision. The trainee should be provided with social security benefits including provident fund, gratuity, and minimum remuneration. The employer is not obliged to appoint the trainee as regular employee upon the completion of training period. However, if such trainee is appointed, he/she shall not be kept in probation. There was no such classification in the previous act and the previous act did not regulate the intern and trainee.

Outsourcing

The previous act has no provision for outsourcing of jobs/services. The practice of outsourcing however, it had judicial baking and allowed to outsource certain manual works such as security personnel, drivers, cleaning staffs, messengers etc. The new labor act deals with outsourcing arrangement.

Work for Outsourcing

The outsourced laborers can be engaged in the works other than core work of the entity. The work that can be carried out by the outsourced laborers can is as prescribed in the Nepal Gazette.

Outsourcing Agency

The company licensed by the labor office or labor department can provide manpower to another entity. The existing manpower suppliers are required to be registered and obtained license within six (6) months from the date of commencement of the new labor act.

Restriction

A company cannot supply manpower for more the two works or services. The new labor act has also restricts to avail the laborers from the labor supplier where the main employer, his management or family members are involved.

Obligation of the Main Employer

The main employer (the person providing work to the outsourced laborers) should obtain laborers from the licensee labor supplier. If the laborers are availed from outsourcing agency without licensed for labor supply the laborers are deemed to be the workers of the main employer. The Main Employer may engage laborers supplied by labor supplier entering into agreement with the labor supplier. The agreement should ensure that the laborers will not be provided the remuneration and facilities below the minimum remuneration and benefits prescribed in the new labor act. The main employer should regularly obtain the information if the labor supplier is providing such remuneration and benefits regularly. The main employer is required to inform the labor office or department if the labor supplier has not provided outsourced labors the remuneration and benefits. Further, the main employer is required to adjust the increment if the minimum remuneration and benefits are increased in accordance with the laws.

Obligation of Labor Supplier

Labor supplier must obtain a license to operate its business. Only after the labor supplier furnishes the security or bank guarantee, the labor office or department issues the license. Labor supplier should provide the remuneration and other facilities to such outsourced workers. The license of the labor supplier can be terminated on non-payment of remuneration

and other benefits. The labor supplier can be fined up to Rs. 25,000 for violating any regulation or directives framed under the Nee Labor Act. In case of liquidation of the labor supplier, the workers shall be paid the outstanding remuneration and facilities within 15 days. If the labor supplier fails to make such payment, the payment shall be done from the security or bank guarantee furnished.

Hiring Foreign Nationals

The new labor act continues the general terms of hiring of foreign nationals by a local entity that the foreign national can only be hired if local skill sets are not available for the job. In additional to the general rule of hiring of the foreign nationals the new labor act also provides certain new provisions such as flexibility on work permit for certain entities the language of employment agreement, repatriation of salary and terms and condition of service etc. The provisions are briefly summarized below.

General Provisions

No foreign nationals can be engaged in work without having obtained the work permit from the department. Prior to engaging a foreign national in work, the entity must publish an advertisement in national level daily newspaper to fill the vacant posts by Nepali citizens. If no application is submitted or if no local skill set is available for any work after the vacancy publication foreign national can be hired for the work with the approval of labor department. This provision is similar to that of the previous act.

Entity with foreign investment or operating on foreign aid

Work permit to the foreign nationals hired as the chief executive may be provided by simply recording them at the department. The work permit may also be provided in the same manner to the employees for such number as prescribed.

Work Permit for technicians for short period

Technicians engaged for less than three (3) months to carry out repairing of any machinery or installing new technology or similar casual work may be provided work permit simply by recording in the labor department.

Employment Agreement

As per the new labor act, no foreign national can be engaged in work without the employment agreement which should be entered into either in language understandable by such foreign national or in English language. Unless otherwise provided in the agreement, the employment agreement continues for three years.

Repatriation of Income

The foreign nationals can repatriate their income in convertible foreign currency.

Work Permit Exemption

The foreign nationals having diplomatic immunity or the foreign nationals who are exempted from work permit under the treaty or

agreement entered into with Nepal government are exempted from work permit requirement.

Probation Period

The new labor act has shortened the probation period as shown in the table below:

Previous act	New labor act
1 year (240 days)	6 months

iii) Working hours

Working Hours continue to be 8 hours a day and 48 hours a week. Overtime has been increased to 24 hours per week from 20 hours a week. Unlike the Previous Act, the New Labor Act simply requires to make arrangement for transportation while engaging a female employee in such a way that the working period begins or ends before the sunrise or after the sunset.

iv) Leave and holidays

There have been major changes in maternity leave, sick leave and accumulation of leave in the new labor act. It also provides additional category of leave such as paternity leave which was not there in the previous act. The comparison of leave is given in the following table.

Heading	Previous act	New labor act
Weekly off	1 day every week	1 day every week
Public holidays	13 days	13 days 14 days including international women labor day for female employees
Home leave	1 day for every 20 worked days	1 day for every 20 worked days
Sick leave	Half paid up to 15 days eligibility: completion of 1 year of service	Fully paid up to 12 days eligibility: on a proportional basis for those employees who has not completed 1 year of service
Maternity leave	up to 52 days fully paid	up to 14 weeks, fully paid for 60 days
Paternity leave	No	up to 15 days, fully paid
Mourning leave	13 days	13 days
Leave in lieu	No	For the laborers put in work on public holiday or weekly off

...ual leave	30 days in a year, not exceeding 6 months in total service period- unpaid	No
Accumulation	Home leave – Up to 60 days	Home leave– 90 days Sick leave– 45 days excess accumulation– encashed every year.

v) Terminal Benefits

There have been also major changes in the terminal benefit provided to the employees such that the benefits are provided to each laborer irrespective of length of service or nature of employment. The Previous labor act provided the terminal benefits to the permanent employee and for certain benefits such as gratuity the employee should have completed certain year of services. The eligibility criteria have been removed by the new labor act. There have been also changes in the benefits such as rate of gratuity and leave encashment etc. The benefits have been compared in the following table.

Heading	Previous act	New labour act
Provident fund	Contribution: 10% by employer and 10% by employee of the basic remuneration of the concerned employee. Eligibility: permanent employee	The act has continued the same provision. Such amount should be deposited in the social security fund.
Gratuity	Rate of gratuity: For the first 7 years of service: an amount equal to a half a month salary of the relevant year for each year of service. For more than 7 up to 15 years' service: an amount equal to a two third of a month salary of the relevant year for each year of service For service exceeding 15 years: an amount equal to one-month salary of the relevant year for each year of service. Time of Allocation: Every year Eligibility: completion of 3 years	Rate of gratuity: 8.33% of basic remuneration Time of allocation: Every month (time of payment of remuneration) Eligibility: since the first day of employment

	of service	
Leave encashment	Accumulation– home leave up to 60 days. Encashment at the time of discontinuation of service as per the last drawn salary.	Accumulation: –home Leave up to 90 days –sick Leave up to 45 days Encashment at the time of discontinuation of service at the rate of last drawn salary.

vi) Safety and health arrangement

Formulation of Safety and Health Policy

As per the new labor act, the entity should formulate the safety and health policy as per the regulation or directive. Such policy should be registered with labor office.

Safety and Health Committee

Where 20 or more workers are engaged in work in an entity, employer shall constitute a safety and health committee having the representation of workers.

Employer's Duties

The new labor act has set out the duties of employer towards workers which include making appropriate safety and health arrangement, arrangements ensuring no adverse effect on workers from use, operation, storage or transport of chemical, physical or biological liquids, disseminating necessary notice, information and training related to safety and health arrangements, etc. It also sets out the general obligation of employer towards non-workers such as putting the signs to indicate the safety or health hazards, to manage the gas, chemicals waste of the entity so as not to cause adverse effect on local animals, people or environment, etc. The new labor act also sets out the duties of workers related to safety and health arrangements which includes refraining from doing any activities that are likely to cause adverse effect on safety and health of any individuals in the entity, cooperate with the employer to effect the health and safety arrangements, to compulsorily use the personal safety devices provided by the employer, etc.

Stopping Work

In case of the immediate threat of any injury or adverse effect on health or damage to the devices in the entity, the worker should provide the information thereof to the employer who should cause to stop the work until the period the threat is prevented or minimized.

...enting Communicable Diseases

...employer should arrange for the prevention of communicable disease ...e workplace. The worker suffering from the communicable disease ...e ordered to stay in the unpaid leave or adjust with other leave and ...be restricted to come to workplace until cured.

...cal Expenses

...case any worker suffers from the work related hazardous disease, ...e/she should be provided medical expenses. And where such disease ...cannot be cured the worker should be provided compensation as ...prescribed.

...ght Work to Pregnant

The employer is required to make arrangement to put the pregnant female laborer is such work which generally does not have adverse impact on her health.

vii) Social security

The labor act requires the retirement fund such as (a) gratuity, and (b) provident fund to be deposited in the social security fund. There has been separate law on social security. The parliament has enacted the social security act, 2017 (2074) which has also been also obtained the accord of assent of the President on August 16, 2017.

viii) Other key provisions

Composition of Labor Court

As per the act, the labor court shall consist of a chairperson and two members. The jurisdiction of the labor court is exercised collectively where the majority opinion prevails.

Appeal

Any decision or order of the department or labor office can be appealed at labor court within 35 days of such order or decision. Any decision of the entity terminating the employment or on disciplinary action can be appealed at labor court within 35 days of having obtained the notice of such decision. The appeal on the case originally tried and settled by the labor court is placed at Supreme Court. Any decision rendered by the labor court exercising appeal jurisdiction is final.

Enforcement of Decision

The concerned party should enforce the decision or order of the labor court after the finality of such order or decision. The decision on individual or collective dispute or the arbitral award should be enforced by the concerned parties. If the decision or order is not implemented, the concerned party can file an application to the labor office for implementation. The labor office can write to the concerned worker or employer for the implementation of such agreement, decision or order, which shall be effected within 15 day. If the order, decision or agreement

is not enforced as per the procedure mentioned above, the concerned party may submit an application to the labor office for enforcement of such order, decision or agreement. For this purpose, the labor office may write to the concerned office or officer to freeze the immoveable property, to freeze the bank account, to freeze or suspend the concessions, exemptions granted under prevailing laws, to suspend the work permit or issue other necessary orders.

The concerned party can file a complaint to the labor court if the order, decision or agreement, or arbitral award is not enforced within 3 months from the date of filing of application with the labor office or within 15 days from the date of action taken by the labor office for enforcement. The labor court provides a certain time period for implementation and non-compliance during the period is punished with fine up to Rs. 100,000 or imprisonment up to 1 year.

Regulation of Management Level Employee

Manager and managerial level employee have been prohibited from submitting collective demands on behalf of trade union, taking part in collective bargaining and taking part in strike.

Performance Appraisal

The entity can conduct performance appraisal of its workers once in a year in general. The bases and procedure of appraisal should be justifiable and reasonable, and disclosed to workers prior to performance appraisal. The worker should be provided an opportunity to present disagreement on the appraisal, if any. The entity should arrange for the review of the appraisal if such disagreement is submitted.

Certificate of Work Experience

The entity should provide a certificate of work experience stating the period of the service and the post if the worker whose service has been terminated asks for one.

5.3 INTELLECTUAL PROPERTY RIGHT

Intellectual property is a right you have on your creations, like a film, a musical composition, an invention, a brand name, etc. Like any other real property, you have the right to own and protect the creations of your mind. Such a right is called intellectual property. If you have an intellectual property (IP) over any of your work or ideas, others need to take your permission before using it. Otherwise you can initiate legal action against such persons. Intellectual property refers to the right over the intellectual work and not the work itself. The work can be either artistic or commercial. The artistic works come under the category of copyright laws, while the commercial ones, also known as industrial properties, are ruled by patents, trademarks and industrial design rights. Copyright laws deal with the intellectual property of creative works like

books, music, software, painting, etc. Industrial properties cover those created and used for industrial or commercial purposes. As stated earlier, intellectual property is categorized into various types as per the nature of work. The most common types of intellectual property are copyrights, trademarks, patents and industrial design rights. Let us have a brief look at the different types of intellectual property.

5.3.1 Copyrights

A copyright is a right conferred on the owner of a literary or artistic work. It is an exclusive right to control the publication, distribution and adaptation of creative works. The right lies with the owner-cum-copyright holder for a certain period of time. As time lapses, the work can be republished or reproduced by others. Usually, the times pan of a copyright extends through the entire life of the owner and lasts up to a period of about 50 to100 years after death. In case of anonymous works, the right lasts for 95 years after publication or 120 years after the creation.

5.3.2 Trademarks

A trademark is a symbol, which is generally used to identify a particular product, which indicates its source. A trademark can be a combination of words, phrases, symbols, logos, designs, images or devices, used by an individual, legal entity or business organization to distinguish their products from that of others. For example, you can identify the products of Nike Inc., through their logo, which is embossed on their products. Once registered, trademarks are protected legally and the owners can sue persons who use their trademarks.

5.3.3 Patents

Patents are rights related to new inventions. This right is conferred on persons who invent any new machine, process, article of manufacture or composition of matter, biological discoveries, etc. In order to grant a patent, the invention should fit into the following criteria, which may differ from country to country. In general, the invention must be new, inventive and should be useful or can be applied in industries. The person who receives a patent for his invention has an exclusive right to control others from making, using, selling, or distributing the patented invention without permission. Generally, the time limit of a patent is 20 years from the date of filing the application (for the patent).

5.3.4 Industrial Design

These rights also come under intellectual property and protect the visual design of objects that are not purely utilitarian, but have an aesthetic or ornamental value. It can refer to the creation of a shape, color, pattern or a combination of all these things. It can be an industrial commodity or a handicraft. The design can be either two-dimensional (based on pattern,

colors and lines) or three-dimensional (as per shape and surface). An industrial design right is conferred after considering factors like, novelty, originality and visual appeal. The person who has an industrial design right has the exclusive right to make or sell any objects in which the design is applicable. The right is conferred for a period of 10 to 25 years.

5.4 BUILDINGS CODES AND BYLAWS

5.4.1 Building Codes

A building code (also building control or building regulations) is a set of rules that specify the standards for constructed objects such as buildings and non-building structures. Buildings must conform to the code to obtain planning permission, usually from a local council. The main purpose of building codes is to protect public health, safety and general welfare as they relate to the construction and occupancy of buildings and structures. The building code becomes law of a particular jurisdiction when formally enacted by the appropriate governmental or private authority.

Building codes are generally intended to be applied by architects, engineers, interior designers, constructors and regulators but are also used for various purposes by safety inspectors, environmental scientists, real estate developers, subcontractors, manufacturers of building products and materials, insurance companies, facility managers, tenants and others. Codes regulate the design and construction of structures where adopted into law.

The purpose of building codes are to provide minimum standards for safety, health, and general welfare including structural integrity, mechanical integrity (including sanitation, water supply, light, and ventilation), means of egress, fire prevention and control, and energy conservation. Building codes generally include:

- Standards for structure, placement, size, usage, wall assemblies, fenestration size/locations, egress rules, size/location of rooms, foundations, floor assemblies, roof structures/assemblies, energy efficiency, stairs and halls, mechanical, electrical, plumbing, site drainage & storage, appliance, lighting, fixtures standards, occupancy rules, and swimming pool regulations.
- Rules regarding parking and traffic impact.
- Fire code rules to minimize the risk of a fire and to ensure safe evacuation in the event of such an emergency [citation needed].
- Requirements for earthquake (seismic code), hurricane, flood, and tsunami resistance, especially in disaster prone areas or for very large buildings where a failure would be catastrophic [citation needed].
- Requirements for specific building uses (*for example*; storage of flammable substances, or housing a large number of people).
- Energy provisions and consumption.
- Grandfathering provisions: Unless the building is being renovated, the building code usually does not apply to existing buildings.
- Specifications on components.
- Allowable installation methodologies.
- Minimum and maximum room and exit sizes and location.
- Qualification of individuals or corporations doing the work.
- For high structures, anti-collision markers for the benefit of aircraft.

5.4.2 Building Bylaws

Building Bye-Laws is minimum provisions designed from national building code (NBC) by town planning authorities/urban development authorities/municipalities, to protect the safety of public with regarding to structural sufficiency, fire hazards and health aspects.

Objectives of building bylaws

- Disciplined and systematic growth of buildings and towns.
- Prevent haphazard development.
- Protect safety of public against fire, noise, health hazards and structural failure.
- Proper utilization of space.
- Give guideline to architect/engineer in effective planning.
- To provide health, safety and comfort to people.
- Due to it, each building will have proper approaches, light, air and ventilation.

Applicability of building bylaws

- New construction.
- Additions and alterations to a building.
- Occupancy of building changed.
- Development of land.
- Any part or whole building is demolished.

Bye-laws/regulations for different types of building

- Line of building frontage.
- Open spaces around residential building.
- Min standard dimensions of building elements.
- Provisions for lighting and ventilation.
- Provisions for safety from fire and explosion.
- Provisions for means of access.
- Provisions for drainage and sanitation.
- Provisions for safety of works against hazards or accidents.
- Requirements for off-street parking spaces.
- Requirements for greenbelt and landscaping.
- Special requirements for low income group housing.
- Sizes of structural elements.

List of codes in Nepal

1. NCB 000 : 1994 Requirements for state-of-the art design an introduction
2. NCB 101 : 1994 Materials specifications
3. NCB 102 : 1994 Unit weight of materials
4. NCB 103 : 1994 Occupancy load (imposed load)
5. NCB 104 : 1994 Wind load
6. NCB 105 : 1994 Seismic design of buildings in Nepal
7. NCB 106 : 1994 Snow load
8. NCB 107 : 1994 Provisional recommendation on fire safety
9. NCB 108 : 1994 Site Consideration for seismic hazards
10. NCB 109 : 1994 Masonry: unreinforced
11. NCB 110 : 1994 Plain and reinforced concrete
12. NCB 111 : 1994 Steel
13. NCB 112 : 1994 Timber
14. NCB 113 : 1994 Aluminum
15. NCB 114 : 1994 Construction safety
16. NCB 201 : 1994 Mandatory rules of thumb reinforced concrete buildings with masonry infill
17. NCB 202 : 1994 Mandatory rules of thumb load bearing masonry
18. NCB 203 : 1994 Guidelines for earthquake resistant building construction: low strength masonry
19. NCB 204 : 1994 Guidelines for earthquake resistant building construction: earthen building
20. NCB 205 : 1994 Mandatory rules of thumb reinforced concrete buildings without masonry infill
21. NCB 206 : 1994 Architectural design requirements
22. NCB 207 : 1994 Electrical design requirements for (public buildings)
23. NCB 208 : 1994 Sanitary and plumbing design requirements

5.5 COMPANY REGISTRATION

5.5.1 Business Organization

Business

It is the human activities that are related with production of goods and services or sales and purchase of goods and services or exchange of goods and services with profit making objectives.

Law

It is the norms that are drafted and enforces by a state or local government in order to regulate the activities within the state or locality. All the laws that regulate the business are known as business law. Ignorance of law will not be excused.

Sources of business law in Nepal:

- English business law
- Common law of England
- Law of merchants
- Principal of equity
- Statute of legislature
- Custom and usage
- Nepalese statutory act
- Judicial decisions
- Writing and opinions of scholars and commercial treaties and agreements

Types of business enterprises

i) Sole business concern
ii) Partnership business organization
iii) Company business organization
   - Private limited company
   - Public limited company

I) Sole business concern

In this type of business organization, single person establishes, manages, organizes and control the whole business and also singly liable towards the profit and loss of the business. It is registered under private registration act 2014.

Characteristics of sole business

- Sole ownership
- Sole management and control
- Unlimited liability
- Limited areas of operation
- Less legal formalities
- Voluntary origin and end

Limitations of sole business

- Unlimited liability
- Absence of legal status
- Chances of impractical decisions
- Lack of specialization
- Loss in absence of a key person
- Limited capital
- Uncertain future

II) Partnership business organization

In this type of business organization, more than one people join their hands to earn profit by investing collectively. This type of business organization is registered under partnership act 2020.

Characteristics of partnership business

- Joint ownership
- Unlimited liability
- Established on the basis of agreement between persons
- Members do not have separate existence
- Joint management and control
- Joint agent slip
- Partnership right cannot be transferred
- Uncertain existence
- Possibility of misunderstanding and friction between the partners
- Limited capital
- Difficulty in transferring ownership
- Lack of prompt decision
- Lack of public faith
- Unlimited liability
- Sharing of profit and loss
- Limitation of partnership business

III) Company business organization

In this type of business organization, company is established under the Act of the country and has limited liability. Finance is collected through issuance of shares. Company is considered as an artificial legal person. Act 2053 regulates the incorporation of a company in Nepal. Company can be further divided into two as private limited company and public limited company. As per company Act 2053, private limited company has less than 50 shareholders and public limited company shall have minimum 7 shareholders and no upper limit.

Characteristics of company business organization

- Legal artificial person
- Capital collected by issuing shares
- Transferability of shares
- Management by representatives/effective management
- Publication of financial statement
- Unlimited capital
- Perpetual existence
- Limited liability
- Common seal
- Voluntary associations of persons
- Public faith
- Unlimited business capability

Limitation of company business organization:

- Difficulty in formation
- Possibility of fraud
- Exploitation of shareholders

- Group formation for power
- Conflict of interest
- Lack of personal interest
- Lack of secrecy
- Absence of prompt decision
- Lack of closeness

5.5.2 Public Limited Company

A public limited company is a company that has permission to issue registered securities to the general public through an initial public offering (IPO) and it is traded on at least one stock exchange market. A public company is not authorized to begin its business operations just upon the grant of the certificate of incorporation. In order to be eligible to run as a public company, it should obtain another document called a trading certificate.

Advantages of a public limited company

- Members : In order for a company to be public, it should have a minimum of 7 members (maximum unlimited).
- Limited liability : The liability of a public company is limited. No shareholder is individually liable for the payment. The public limited company is a separate legal entity, and each shareholder is a part of it.
- Board of directors : A public company is headed by a board of directors. It should have a minimum of 3 and can have a maximum of 15 boards of directors. They are elected from among the shareholders by the shareholders of the company in annual general meetings. The elected directors act as representatives of the shareholders in managing the company and taking decisions. Having a bigger board of directors therefore benefits all shareholders in terms of transparency as well as fostering a democratic management process.
- Transparency : Private limited companies are strictly regulated and are required by law to publish their complete financial statements annually to ensure the true financial position of the company is made clear to their owners (shareholders) and potential investors. This also helps to determine the market value of its shares.

- Capital : A public company can raise capital from the public by issuing shares through stock markets. Public companies can also raise capital by issuing bonds and debentures that are unsecured debts issued to a company on the basis of financial performance and integrity of the company.
- Transferable shares : A public limited company's shares are purchased and sold on the market. They are freely transferred among the members and the people trading on stock markets.

Disadvantages of public limited company

- **Prospectus**
  For a public company, issuing prospectus is mandatory because the public is invited to subscribe for the shares of the company.
- **Expensive**
  Going public is an expensive and time consuming process. A public company must put its affairs in order and prepare reports and disclosures that match with SEBI regulations concerning initial public offerings (IPO). The owner has to hire specialists like accountants and underwriters to take the company through the process.
- **Equity dilution**
  Any company going public is selling a part of the company's ownership to strangers. Each bit of ownership that the owner sells comes out of their current equity position. It is not always possible to raise the amount of money that you may need to operate a public corporation from shares, so company owners should hold at least 51 percent of the ownership in their control.
- **Loss of management control**
  Once a private company goes public, managing the business becomes more complicated. The owner of the company can no longer make decisions independently. Even as a majority shareholder, they are accountable to minority shareholders about how the company is managed. Also, company owners will no longer have total control over the composition of the board of directors since SEBI regulations place restrictions on board composition to ensure the independence of the board from inside impact.
- **Increased regulatory oversight**
  Going public brings a private company under the supervision of the SEBI and other regulatory authorities that regulate public

companies, as well as the stock exchange that has agreed to list the company's stock. This increase in regulatory oversight significantly influences management of the business.

- **Enhanced reporting requirements**
  A private company can keep its internal business information private. A public company, however, must make extensive quarterly and annual reports about business operations, financial position, compensation of directors and officers and other internal matters. It loses most privacy rights as a consequence of allowing the public to invest in its stock.
- **Increased liability**
  Taking a private company public increases the potential liability of the company and its officers and directors for mismanagement. By law, a public company has a responsibility to its shareholders to maximize shareholder profits and disclose information about business operations. The company and its management can be sued for self-dealing, making material misrepresentations to shareholders or hiding information that federal securities laws require to be disclosed.

5.5.3 Private Limited Company

A private limited company is a business entity that is held by private owners. This type of entity limits the owner's liability to their ownership stake, and restricts shareholders from publicly trading shares.

Advantages of a private limited company

- Members : You can start a private limited company with a minimum of only 2 members (and maximum of 200), as per the provisions of the companies act 2013.
- Limited liability : The liability of each shareholder or member is limited. This means that if the company runs into a loss, the company shareholders are liable to sell their company shares to clear the debt or liability. The individual or personal assets of shareholders or members are not at risk.
- Perpetual succession: As per company law, perpetual succession means that the company continues its existence even any owner or member dies, goes bankruptcy, exits from the business and transfers his shares to another person.
- Prospectus : Prospectus is a detailed statement that must be issued by a company that goes public.

However, private limited companies do not need to issue a prospectus because the public is not invited to subscribe for the shares of the company.

- Number of directors : A private limited company needs a minimum of only 2 directors. At least one director on the board of directors must have stayed in India for a total period of not less than 182 days in the previous calendar year. The directors and the shareholders can be the same people.
- Capital : Minimum share capital required is only Rs. 1 lakh.

Disadvantages of a Private Limited Company

- The shares in a private limited company cannot be sold or transferred to anyone unless other shareholders agree on the same.
- There is no option to invite public to subscribe to the shares.
- It is mandatory that you should mention Pvt. Ltd. at the end of a company name.

5.5.4 Difference between Private Limited Company and Public Limited Company

Features	Public limited company	Private limited company
Minimum members	7	2
Minimum directors	3	2
Maximum members	Unlimited	200
Minimum capital	NRs. 500000	NRs. 100000
Invitation to public	Yes	No
Issue of prospectus	Yes	No
Quorum at AGM	5 members	2 members
Certificate for commencement of Business (Mandatory)	Yes	No
Term used at the end of name	Limited	Private Limited
Managerial remuneration	No restriction	Cannot exceed more than 11% of Net profits
Statutory meeting (Mandatory)	Yes	No

5.6 EXAM SOLUTION

1. **How do you distinguish copyright with patent right?** [2069 Bhadra; W: 3]

Ans: See the definition part 5.3.2 and 5.3.3

2. **Differentiate between public limited company and private limited company.** [2069 Bhadra; W: 5]

Ans: See the definition part 5.5.4

3. **Differentiate patent right and trademark right. Write down the characteristics of company business organization. What are the sources of business law in Nepal?** [2071 Bhadra; W: 4]

Ans: See the definition part 5.3.2, 5.3.3 and 5.5.1

4. **Why should you be aware of labour law? What will you do if a construction worker dies by falling from height in your site?** [2071 Magh; W: 4]

Ans: See the definition part 5.2

5. **Write short notes on: Copyrights, patent and trademarks** [2071 Magh; W: 4]

Ans: See the definition part 5.3.1, 5.3.2 and 5.3.3

6. **Write short notes on: Building codes and bylaws** [2072 Ashwin; W: 4]

Ans: See the definition part 5.2

7. **Describe intellectual property rights, copyrights, trademark and patent rights** [2072 Magh; W: 5]

Ans: See the definition part 5.3

8. **What is intellectual property right? Write in brief the working hour prevision of labour law. Differentiate between public and private company.** [2073 Bhadra; W: 4]

Ans: See the definition part 5.3, 5.2 and 5.5.4

9. **Explain business law and labour law in Nepal.** [2073 Bhadra; W: 4]

Ans: See the definition part 5.2 and 5.5.1

10. **What is an intellectual property right?** [2073 Magh; W: 4]

Ans: See the definition part 5.3

11. **Write short notes on: Trademarks, patents and design** [2073 Magh; W: 4]

Ans: See the definition part 5.3.2, 5.3.3 and 5.3.4

12. Explain copy right, patent right and trademark. [2074 Magh, W: 6]

Ans: See the definition part 5.3

13. What are the difference between NEA and NEC? What are the necessities of the company registration in Nepal?
[2075 Bhadra, W: 2+3]

Ans: The difference between the NEA and NEC are as follows:

	NEC	NEA
1.	Statutory body, established under NEC Act, in 1999	An NGO, established in 1962
2.	Must register before practicing engineering profession	Registration/membership is voluntary
3.	Executive body by election and nomination	Executive body by election
4.	Evaluates and approves establishment of academic institutes offering engineering programs	No such provision
5.	Offers different categories of engineering profession: general, professional, foreign	No such provision
6.	Monitors academic institutes offering engineering programs (every year for temporary approval and every other year for permanent approval), and cancels approval if found not up to standard	No such provision
7.	The directives and code of conduct issued are mandatory	The directives and code of conduct issued are voluntary
8.	Total number of member is 18	Total number of member is 25

Following are the necessities of the company registration in Nepal:

i) Settlement of claims

A registered firm can file suit against third parties. So the rights of registered firms are safeguarded by law. But an unregistered firm or its partner cannot enforce its claim against the third parties or its co-partner.

ii) Protection of rights

The rights and privileges of new partners are also protected in registered firms. But if an incoming partner fails to register himself, he will incur great risk, because he will not be in a position to file suit for his dues against his firms or his co-partners.

iii) Protection of property

The property of the retired or deceased partner continues to be liable for the acts firm does after his death or retirement until public notice is served for the change to a registrar, so there is a strong inducement for partners of registered firms to have the changes noted in the register.

iv) Protection to creditors

The registered firm has to maintain the correct, complete, and up to date record of its partners who will be liable for the obligations of the firm. The statement recorded in the register regarding the constitution of the firm would afford a strong safeguard against an untrue refusal of partnership and the evasion of liability to persons who want to deal with the firm.

v) Government facilities

The government provided many facilities and privileges to registered firms. It gives protection to business and production, which makes it more profitable.

vi) Business reputation

Registration adds to reputation. Other firms cannot copy their products. Such firms use their trademarks, which are registered, and no other firm registered or not registered can use this trademark. These firms advertise only their trademark but not products. When people find a product up to their standard, they note its trademark. This makes the firm's business more profitable.

vii) Public confidence

People have more confidence in the registered firm than in the unregistered firm because they think that these firms are working under the supervision of the government, and there are no chances of fraud or misrepresentation on behalf of registered firms.

14. What are the necessities of company registration in Nepal? How does an intellectual property right encourage the investors for new works? Justify. [2075 Magh]

Ans: The difference between the NEA and NEC are as follows:

For the first part

See the solution of Q. no. 13

For the second part

Following are the main functions/reasons of the intellectual property right to encourage the investors for new works:

- ✓ IPRs can help turn your ideas into money makers
- ✓ IPRs can enhance your business' market value

- ✓ IPRs can help you stand out from the competition
- ✓ IPRs can be accessed to raise finances
- ✓ IPRs can enhance opportunities related to exports in business
- ✓ Ability to have a competitive edge over other similar businesses
- ✓ IPRs enhances your company's value
- ✓ IPRs helps you market your company's products and services.

15. Define intellectual property. Explain trademark, service marks, patent and copyright in brief. [2076 Bhadra, W: 4]

Ans: See the definition part 5.3

16. Describe briefly the different types of intellectual property rights. What are the biggest challenges for startup companies? [2077 Chaitra; W: 2+2]

Ans: **For the first part**

See the definition part 5.3

For the second part

The biggest challenges faced by startup companies are as follows:

i) Fierce competition

As there is always a competition going on between the giants, it poses one of the biggest challenges for the survival of startup companies. Competitive environment ensures there is no margin of error.

ii) Hiring suitable candidates

One of the important factors that define organizational culture within a startup company is the synergy of the team. Selecting suitable candidates is one of the tricky tasks for startup companies in this digital age.

iii) Financial management

At times where there is a cash influx, startup companies tend to find it really hard to properly manage their finances and they bog down against the pressure.

iv) Unrealistic expectations

Startup companies tend to face challenges when they set unrealistic expectations following a success. Maintaining sustainability requires constant efforts in a company.

17. What are the general principles of leave and holidays? Explain the steps of disciplinary action for misconduct, as per the labour Act 2074 of Nepal. [2078 Chaitra; W: 4]

Ans: **General Principles of leave and Holidays**

Section 51 of the Labor Act 2074 of Nepal states the general principles of leave and holidays which are listed below:

- ➢ Leave is not regarded as a matter of right, but of privilege. The approving authority may accept or decline a leave request or curtail an approved leave.
- ➢ Prior leave approval may be required except in cases of urgency.
- ➢ Taking a leave without approval may be considered misconduct.

NOTE:
Do not confuse principles with provisions. Section 51 states general principles whereas section 40–48 states provisions for leave and holidays. If provisions have been asked, see the definition part 5.2 (iv)

Steps of Disciplinary Action for Misconduct As Per Labor Act 2074

The employer shall seek an explanation from the employee and provide to the employee in writing:

- ➢ A letter stating the misconduct and punishment that are likely to be awarded.
- ➢ 7 days time to submit an explanation.
- ➢ Time limitation for seeking explanation: within 2 months from the date of committing misconduct.
- ➢ Time limitation for punishment: within 3 months from the date of requiring of explanation.
- ➢ Authority to issue punishment: Chief executive officer or the managerial level employees authorized by the Employee Bylaws.

Based on the nature of misconduct done by the employees, following disciplinary action can be taken:

- ➢ Warning/reprimand
- ➢ Deduction of one day's remuneration
- ➢ Withholding annual grade of remuneration or promotion
- ➢ Termination upon misconduct
- ➢ Employment termination based on the seriousness of the offence.

18. Write short notes on: Intellectual property right. [2078 Chaitra; W: 4]

Ans: See the definition part 5.3

19. What is intellectual property right and why is it necessary? [2078 Chaitra; W: 4]

Ans: **For the first part**

See the definition part 5.3

For the second part

Intellectual property rights provide creators protection for original works, inventions, artistic works, scientific developments and so

on. Similarly, intellectual property rights i ...icentives fo... individuals to continue to produce things ...er create job opportunities and new technologies while enabling our world to improve and evolve even faster.

Intellectual property rights are necessary due to the following reasons:

i) IPRs reward creativity and human endeavor and also create a healthy competition among creators, which fuel the progress of mankind. For example, the multibillion dollar firms and industries would not exist without copyright protection.

ii) The promotion and protection of intellectual property rights spurs economic growth, creates new jobs and industries, and enhances the quality and enjoyment of life.

iii) Intellectual property rights enhance innovation and creativity by protecting the rights of inventors and artists. By providing due recognition to the creators, these laws provide the incentive to create newer works, products and services.

iv) These rights help strike a balance between the interest of innovators and the public interest, providing an environment in which creativity and innovation can flourish, for the benefit of all.

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6.1 GLOBALIZATION AND CROSS-CULTURAL ISSUES

6.1.1 Globalization

Globalization is a process of interaction and integration among the people, companies, and governments of different nations, a process driven by international trade and investment and aided by information technology. This process has effects on the environment, on culture, on political systems, on economic development and prosperity, and on

on. Similarly, intellectual property rights increase the incentives for individuals to continue to produce things that further create job opportunities and new technologies while enabling our world to improve and evolve even faster.

Intellectual property rights are necessary due to the following reasons:

i) IPRs reward creativity and human endeavor and also create a healthy competition among creators, which fuel the progress of mankind. For example, the multibillion dollar firms and industries would not exist without copyright protection.

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6.1 GLOBALIZATION AND CROSS-CULTURAL ISSUES

6.1.1 Globalization

Globalization is a process of interaction and integration among the people, companies, and governments of different nations, a process driven by international trade and investment and aided by information technology. This process has effects on the environment, on culture, on political systems, on economic development and prosperity, and on

human physical well-being in societies around the world. Globalization is not new, though. For thousands of years, people-and, later, corporations-have been buying from and selling to each other in lands at great distances, such as through the famed Silk Road across Central Asia that connected China and Europe during the Middle Ages. Likewise, for centuries, people and corporations have invested in enterprises in other countries. In fact, many of the features of the current wave of globalization are similar to those prevailing before the outbreak of the First World War in 1914. But policy and technological developments of the past few decades have spurred increases in cross-border trade, investment, and migration so large that many observers believe the world has entered a qualitatively new phase in its economic development. Since 1950, for example, the volume of world trade has increased by 20 times, and from just 1997 to 1999 flows of foreign investment nearly doubled, from $468 billion to $827 billion. Distinguishing this current wave of globalization from earlier ones, author Thomas Friedman has said that today globalization is "farther, faster, cheaper, and deeper."

This current wave of globalization has been driven by policies that have opened economies domestically and internationally. In the years since the Second World War, and especially during the past two decades, many governments have adopted free-market economic systems, vastly increasing their own productive potential and creating myriad new opportunities for international trade and investment. Governments also have negotiated dramatic reductions in barriers to commerce and have established international agreements to promote trade in goods, services, and investment. Taking advantage of new opportunities in foreign markets, corporations have built foreign factories and established production and marketing arrangements with foreign partners. A defining feature of globalization, therefore, is an international industrial and financial business structure. Technology has been the other principal driver of globalization. Advances in information technology, in particular, have dramatically transformed economic life. Information technologies have given all sorts of individual economic actors-consumers, investors, businesses-valuable new tools for identifying and pursuing economic opportunities, including faster and more informed analyses of economic trends around the world, easy transfers of assets, and collaboration with far-flung partners. Globalization is deeply controversial, however. Proponents of globalization argue that it allows poor countries and their citizens to develop economically and raise their standards of living, while opponents of globalization claim that the creation of an unfettered international free market has benefited multinational corporations in the Western world at the expense of local enterprises, local cultures, and common people. Resistance to globalization has therefore taken shape both at a popular and at a governmental level as people and governments

try to manage the flow of capital, labor, goods, and ideas that constitute the current wave of globalization.

Impacts of globalization

Positive impacts of globalization

- Adopting to globalization increase free trading opportunities between countries. This allows business organizations in developed countries to invest in developing countries.
- As the communication between the countries becomes open sharing of information became easier due to globalization. This has also contributed to the increase in speed of transportation of products.
- Countries joining together through globalization will remove the cultural barriers and make the world a global village. Globalization makes the countries adopt the factors that are beneficial in the long run.
- There is also a possibility of less war between developed countries due to globalization.

Negative impact of globalization

- If the rules and regulations regarding the protection of the environment are less in underdeveloped countries, other developed countries can manufacture products that may harm the environment.
- A majority of big industries prefer cheap labour people in a skilled and non-skilled category will go for the job in developed countries.

Even though there is some negative impact due to globalization, the positive effects are dominating. It is also possible to reduce the various risks involved.

6.1.2 Cross Culture

Cross culture often refers to a company's initiatives to increase understanding of different groups. Understanding leads to stronger more productive communication and marketing aims to reach clients outside of the company's traditional market. Healthy cross-culture interactions of people from varying backgrounds are vital in international business.

Cross culture is becoming increasingly important with the globalization of businesses. Many companies devote substantial resources to training employees how to communicate and interact effectively with those from different cultures. Cross culture can develop through personal experiences. For example, if an employee of an international company transfers to another country, they may experience the cross culture. To assimilate, they must learn the language, understand the culture, and adapt or conform to social norms. Cross culture initiatives are imperative to implement for employees acting in managerial capacities. Failures of

effective communication with, or understand their subordinates' actions, may lead to cascading problems within the business. Failing to adapt and adequately communicate results in a slowing of production, loss of credibility, and stifles progress.

Example of cross culture

Simple practices and behaviors may be viewed quite differently in various cultures. Accepting a business card from a Japanese businessperson, for example, is more ceremonial in the Japanese culture than you would find in the American culture. The person presenting the card will bow and present the card with both hands. The receiver should take it with both hands to show respect. Contrastingly, in many western societies, such as the United States, business cards are exchanged freely with little consideration. Understanding these small, yet significant, differences help enhance relationships between members of different cultures.

6.2 PUBLIC PRIVATE PARTNERSHIP

The *PPP Knowledge Lab* defines a PPP as "a long-term contract between a private party and a government entity, for providing a public asset or service, in which the private party bears significant risk and management responsibility, and remuneration is linked to performance".

Public-private partnerships between a government agency and private-sector company can be used to finance, build and operate projects, such as public transportation networks, parks and convention centers. Financing a project through a public-private partnership can allow a project to be completed sooner or make it a possibility in the first place.

For example, a city government might be heavily indebted, but a private enterprise might be interested in funding the project's construction in exchange for receiving the operating profits once the project is complete.

Public-private partnerships have contract periods of 25 to 30 years or longer. Financing comes partly from the private sector but requires payments from the public sector and/or users over the project's lifetime. The private partner participates in designing, completing, implementing and funding the project, while the public partner focuses on defining and monitoring compliance with the objectives. Risks are distributed between the public and private partners according to the ability of each to assess, control and cope with them. Although public works and services may be paid for through a fee from the public authority's revenue budget, such as with hospital projects, concessions may involve the right to direct users' payments, as with toll highways. In cases such as shadow tolls for highways, payments are based on actual usage of the service. In cases involving wastewater treatment, payment is made with fees collected from users.

6.2.1 Benefits and Risks of Public-Private Partnerships

Private-sector technology and innovation help provide better public services through improved operational efficiency. The public sector provides incentives for the private sector to deliver projects on time and within budget. In addition, creating economic diversification makes the country more competitive in facilitating its infrastructure base and boosting associated construction, equipment, support services and other businesses. Physical infrastructure such as roads or railways involves construction risks. If the product is not delivered on time, exceeds cost estimates or has technical defects, the private partner typically bears the burden.

The private partner faces availability risk if it cannot provide the service promised. *For example;* the company may not meet safety or other relevant quality standards when running a prison, hospital or school. Demand risk occurs when there are fewer users than expected for the service or infrastructure, such as toll roads, bridges or tunnels. If the public partner agreed to pay a minimum fee no matter the demand, that partner bears the risk.

Key types of project risks to public or private partners

Phase	Type of Risk
Development phase	Planning and environmental process
	Political will
	Regulatory
	Site
	Permitting
	Procurement
	Financing
Construction phase	Engineering and construction
	Changes in market conditions
Operation phase	Traffic
	Competing facilities
	Operation and maintenance
	Appropriation
	Financial default risk to public agency
	Refinancing
	Political
	Regulatory
	Handback

Advantages of public private partnerships

- Ensure the necessary investments into public sector and more effective public resources management;
- Ensure higher quality and timely provision of public services;
- Mostly investment projects are implemented in due terms and do not impose unforeseen public sectors extra expenditures;
- A private entity is granted the opportunity to obtain a long-term remuneration;
- Private sector expertise and experience are utilized in PPP projects implementation;
- Appropriate PPP project risks allocation enables to reduce the risk management expenditures;
- In many cases assets designed under PPP agreements could be classified off the public sector balance sheet

Disadvantages of public private partnerships

- Infrastructure or services delivered could be more expensive;
- PPP project public sector payments obligations postponed for the later periods can negatively reflect future public sector fiscal indicators;
- PPP service procurement procedure is longer and more costly in comparison with traditional public procurement;
- PPP project agreements are long-term, complicated and comparatively inflexible because of impossibility to envisage and evaluate all particular events that could influence the future activity.

6.2.2 Types of PPP in Nepal

There are three basic models of PPPs that will be applicable in Nepal, namely revenue based, availability based and hybrid types.

i) Revenue-based PPPs

Revenue-based PPPs are PPPs where the private party receives revenues solely from the direct collection of user charges. Revenue-based PPPs are expected to be applied in sectors where direct and clear user charges can be applied and collected, such as transport and similar infrastructure and services.

ii) Availability-based PPPs

Availability-based PPPs are PPPs where the private party receives revenues from payments from the public partner or other government body. Availability-based PPPs are expected to be applied in sectors where direct user charges are either impossible or undesirable (social sectors like health or education) or where the government itself is effectively the user (such as accommodation projects for government buildings, etc.).

iii) Hybrid PPPs

Hybrid PPPs are PPPs where the private party receives revenues through some combination of user charges and availability payments, and/or may obtain revenues by exploiting other assets or right.

6.2.3 Eligible Partners and their Roles in PPP of Nepal

The public and private partners are the eligible partners which enter into PPP arrangements. The important role of citizens and civil society is also defined.

i) Public partners

- PPP arrangements under this policy framework are to be applied at the central and local levels in Nepal.
- The public partners that are eligible to enter into PPP arrangements are:
- National level ministerial and government departments individually or in inter-ministerial arrangements.
- Public bodies, namely entities having majority shareholding of the government, *for example;* Civil Aviation Authority, Electricity Authority etc.
- Federal/Regional level offices of the Government of Nepal.
- Local level public bodies, specifically district, municipal and VDC level government entities.

ii) Private partners

- PPP projects require private partners to cover the multiple aspects of a project, potentially including design, construction, project management, financing, operation and maintenance.
- The Government of Nepal recognizes the few domestic private parties in Nepal have experience in covering all project related activities, and that experience with fully integrated life cycle PPP projects is limited.
- It is also recognized that PPP projects are often undertaken by consortiums of private partners who collectivity mobilize the capacity required for the project.
- Private partners eligible to enter into PPP arrangements include:
- Private enterprises: domestic or foreign.
- NGO/INGOs
- Community based organizations
- Cooperative organizations.

Recent activities of PPPs of Nepal

- Recently, the GoN has established PPP Cell at the NPC and has planned to establish PPP Units in concerned ministries.
- In the near future some small and doable PPP demonstration projects are going to be selected to implement the PPP projects.
- Furthermore, the GoN has decided to implement three big projects in Public Private and Peoples Partnership (PPPP) model:
  1. Kathmandu-Hetauda tunnel road project (60 km) estimated cost US $ 330 million

2. Kathmandu–Terai fast track expressway road (78 km) estimated construction cost US $ 1 Billion
3. Budhi Gandaki hydro power project
4. Pokhara cable car project

6.3 SAFETY, RISK AND BENEFIT ANALYSIS

Risk

Concept of Risk

- Risk in technology could include dangers of:
  - Bodily harm,
  - Economic loss, or
  - Environmental degradation.
- A situation involving exposure to danger
- Absolute safety is not possible .Any improvement in making a product safe involves an increase in the cost of production.
- It is very important for the manufacturer and the user to have some understanding to know about the risk connected with any product and knows how much it will cost to reduce those risks.
- Risk is the potential that something unwanted and harmful may occur.
- We take a risk when we undertake something or use a product that is not safe.

Types of Risk

- Acceptable risk
- Voluntary risk and control
- Job related risk

Safety

Concept of Safety

- "A ship in harbor is safe, but that is not what ships are built for".
- 'A thing is safe if its risks are judged to be acceptable'.

Definition for Safety

- "A thing is safe (to a certain degree) with respect to a given person or group at a given time if, were they fully aware of its risks and expressing their most settled values, they would judge those risks to be acceptable (to that certain degree).
- Safety: Safe operation of system and the prevention of natural or human caused disaster.

Risk Benefit Analysis

- Risk-benefit analysis involving studies, testing about the comparison of the risk of a situation to its related benefits.

- Risk Benefit analysis (RBA) is an approach to risk assessment that focuses not just on the risks of the activity, but on the benefits of the activity.
- Risk–benefit analysis is analysis that seeks to quantify the risk and benefits and hence their ratio. Exposure to personal risk is recognized as a normal aspect of everyday life. A certain level of risk in our lives is accepted as necessary to achieve certain benefits.
- Risk is an essential element in the development of children's physical, emotional and intellectual development.
- Risk isn't just about physical actions–*for example;* climbing a tree or skateboarding. It's also about taking intellectual risks–trying anything for the first time, testing new ideas, accepting other people's opinions (even if you don't agree with them).
- *For example;* driving an automobile is a risk most people take daily.

6.4 DEVELOPMENT AND ENVIRONMENT

Environment and Development are considered as two sides of the same coin. The environmental degradation, in fact, started with the propagation of human race, *e.g.*, considering the mythological suggestion that the process of Adam and Eve who ate an apple and threw away the peels, which led to the beginning of the environmental degradation.

This process of environmental degradation was accelerated with the development of socio-economic activities, *e.g.*, agriculture, industrialization, drugs and pharmaceuticals, transport, civil construction including roads and buildings, etc., with growing population, the requirements of food grains and other consumer items increased greatly, leading to further environmental degradation.

Environmental impact assessments (EIA)

Environmental Impact Assessment (EIA) is a tool that seeks to ensure sustainable development through the evaluation of those impacts arising from a major activity (policy, plan, program, or project) that are likely to have significant environmental effects. It is anticipatory, participatory, and systematic in nature and relies on multi–disciplinary input (Glasson et al, 1994).

An environmental impact assessment (EIA) is an assessment of the possible impact– positive or negative–that a proposed project may have on the natural environment. The purpose of the assessment is to ensure that decision–makers consider environmental impacts used to decide whether to proceed with the project.

The International Association for Impact Assessment (IAIA) defines an environmental impact assessment as "the process of identifying, predicting, evaluating and mitigating the biophysical, social, and other

relevant effects of development proposals prior to major decisions being taken and commitments made. Environmental Impact Assessment (EIA) studies need a significant amount of primary and secondary environmental data. The primary data are those which need to be collected in the field to define the status of environment (like air quality data, water quality data etc.). The secondary data are those data which have been collected over the years and can be used to understand the existing environmental scenario of the study area.

Sustainable development

Sustainable development is the organizing principle for meeting human development goals while at the same time sustaining the ability of natural systems to provide the natural resources and ecosystem services upon which the economy and society depend. The desired result is a state of society where living conditions and resource use continue to meet human needs without undermining the integrity and stability of the natural system. Sustainable development can be classified as development that meets the needs of the present without compromising the ability of future generations.

6.5 CONFLICT AND DISPUTE MANAGEMENT

6.5.1 Conflict

The term 'conflict' has wide connotation. It is subject to different interpretations in different context. It is generally referred to a psychological state of mind where a person cannot decide the behaviour this way or that way. Sometimes, the term is used as a difference of opinion between two persons or groups irrespective of their status in the organization. *For example;* we say, they have conflicting views. No less frequent is the phenomenon where people are engaged in showdowns, each party developing strategies to meet the challenge of the other and get polarized into two warring groups. Conflict is a powerful process having both desirable and undesirable consequences, so, it cannot be eliminated, it can be and should be managed properly and timely. Conflicts may be at individual level, group level and at organizational level. At all levels, it may develop and be managed. In resolving a conflict, managers should first diagnose the causes of conflict and then think of the strategy for a particular kind of conflict. There may be different strategies to be used to handle the conflict efficiently in different cases. Conflict may arise within an organization or outside it. Both affect the work efficiency of the individual and of the group because people engaged in conflict are busy in planning out the strategy to shown down the other party. So, they are not at work by heart and thus, it affects the productivity and efficiency of the individual, group and the organization. It should be resolved as early as possible.

6.5.2 Definition of Conflict

Conflict can be defined in many ways and can be considered as an expression of hostility, negative attitudes, antagonism, aggression, rivalry and misunderstanding. It is also associated with situations that involve contradictory or irreconcilable interests between two opposing groups. A few definitions of conflict are as given below:

"A simple definition of conflict is that it is any tension which is experienced when one person perceives that one's needs or desires are likely to be thwarted or frustrated".

Mary Parker Follett simply defines conflict as, "the appearance of difference, difference of opinions, of interests".

Thomas Chung and Rich Megginson defines conflict as, "the struggle between incompatible or struggling needs, wishes, ideas, interests or people. Conflict arises when individuals or groups encounter goals that both parties cannot obtain satisfactorily".

According to **David L. Austin** (1972), "It can be defined as a disagreement between two or more individuals or groups, with each individual or group trying to gain acceptance of its view or objectives over others".

Conflict management is the process of limiting the negative aspects of conflict while increasing the positive aspects of conflict. The aim of conflict management is to enhance learning and group outcomes, including effectiveness or performance in an organizational setting.

6.5.3 Level of conflict

i) **Intrapersonal conflict** : conflict within self-due to differences in goal, role, and personal values.

ii) **Interpersonal conflict** : between two or more persons; can be due to differences in goal, role, values, culture, and communication gap.

iii) **Intergroup conflict** : between two or more groups of people.

iv) **Inter-organizational conflict** : between two or more organizations.

v) **International Conflict**

6.5.4 Sources of Conflict

I) **Personal differences/personality clash**

When the ideas, values, culture and customs of a person (or persons) are incompatible with other persons of an organization.

ii) Goal and role incompatibility

When the ideas, values, culture and customs of a person (or persons) are incompatible with the goal of an organization or assigned role of the person in the organization.

iii) Organizational climate and change

When the work environment and rules of an organization are unpredictable, and when the rules or managers or owner of the organization suddenly changes.

iv) Gender and other social differences

When the work environment and rules are designed to favor employees from a particular socio-cultural background or particular gender.

v) Availability and access to resources

When the availability of resources becomes too limited and/or unevenly distributed. When access to resources is uneven.

vi) Communication gap

When there is communication gap between organization and its employees.

6.5.5 Conflict resolution methods

Following are the methods of resolution of conflict:

i) **Avoidance** : avoid conflict, ignore conflict, "time will heal."
ii) **Diffusion** : distraction and defuse into multiple sectors.
iii) **Containment** : conflict contained within certain people, and resolved through discussion and bargaining.
iv) **Confrontation**: conflict brought in front of all concerned, conflict resolution through open dialogue, face-to-face meeting, open bargaining, and resorting to legal process, if needed.
v) **Conciliation** : Mutually agreed terms and conditions, "give and take" approach, 'without direct involvement of outsiders (mediator), even though the mediator assists in bringing the parties together.
vi) **Mediation** : similar to conciliation, but with direct involvement of outsiders (mediator).
vii) **Arbitration** : Resolution through certified professional arbitrator.
viii) **Litigation** : Resolution through court, as per prevailing laws and rules.

6.5.6 Dispute

A dispute is a disagreement between two or more parties. Disputes can arise over many issues; however the most common forms of dispute concern money, property, employment, accidents, marriage breakups and family separations. Many disputes may require some form of legal action to resolve.

6.5.7 Dispute Resolution Methods

As per PPA and PPR, if there is a dispute between an employer and contractor in a construction contract, firstly it is resolved through amicable settlement (*i.e.*, negotiation). If not possible from amicable settlement then the dispute can be resolved from either arbitration or dispute resolution board depend upon the governing law of the country. Following are the methods of dispute resolution (sequentially) in practice:

i) Amicable settlement (Negotiation)

Amicable settlement clause includes the agreement that if a cause for a dispute should arise between a contractor and a project owner, these parties will attempt to reach a just and satisfactory resolution between themselves before moving on to other means. It is the most effective way of dispute resolution.

If the parties in dispute cannot resolve the dispute through mutual consensus (amicable settlement), then:

- ✓ For works of value up to Rs. 100 million, disputes can be settled by sole adjudicator.
- ✓ For works of value above Rs. 100 million, disputes shall be settled by a Dispute Resolution Board (DRB) consisting of three members.
- ✓ If the parties cannot settle dispute through adjudicator or DRB, then the dispute can be resolved through arbitration or litigation (court).

ii) Mediation

A mediation clause suggests the inclusion of a neutral third party in the dispute situation to help mediate the process of resolving the dispute. Mediation is not legally binding in any way, but can be an effective way out of a situation, which could otherwise deteriorate.

iii) Adjudication

The adjudication method also includes a neutral third party but unlike with the mediation method, the adjudicator will give a decision, whereas the mediator will assist parties in finding the resolution. Adjudication clauses typically also include the possibility of applying to a court to enforce the adjudicator's decision, if the dispute is not resolved by the decision itself. It is a cost-efficient method, which helps operations proceed while the dispute is resolved. The DAB: is the dispute adjudication board, there is either one or three member.

The following are the characteristics of adjudication:

- ✓ It is a mechanism of dispute resolution.
- ✓ An independent third party, called adjudicator, awards the decision.

- ✓ Quicker and inexpensive mechanism of dispute resolution, compared to arbitration and litigation, normally taking less than 30 days.
- ✓ The Public Works Directive (PPD) and the Public Procurement Act (PPA 2063) have provisions for dispute resolution through adjudication.

iv) Arbitration

If parties decide to go for arbitration, they will again have a neutral third party enter the situation to help resolve it. In arbitration, parties agree to the arbitrator who has the relevant experience to engage in the matter. The arbitrator considers documents and facts that concern the situation, and can make a decision that favors one side if the parties fail to achieve consensus. Arbitrations can be legally binding, depending on the jurisdiction. The costs of arbitration can be significantly higher (the cost share by the both parties) than that of other methods, sometimes even as high as legal proceedings. The following are the advantages of arbitration over litigation.

- ✓ It is a private alternative to formal court procedure.
- ✓ The arbitrators are normally technical experts.
- ✓ Less time consuming.
- ✓ Less expensive.
- ✓ No public hearing, so low publicity (which is normally preferred by the parties).
- ✓ Less formal, hence more convenient to the parties of dispute.
- ✓ The PPA 2063 has recognized arbitration as a means of disputers solution. The Arbitration Act 2038 governs the arbitration process in Nepal. The Nepal Arbitration Council 1991 has been providing arbitration services in Nepal. However, in Nepal, most of the disputes go to court, or settled out of court through mutual consent, even after arbitration, by ignoring the arbitrator's decisions.

v) Litigation

Litigation involves the disputing parties going into court to have a judge or jury decide the matter for them.

6.5.8 Conflict vs. Dispute

- ✖ John Burton (1990): a dispute is a short-term disagreement that can result in the disputants reaching some sort of resolution; it involves issues that are negotiable. Conflict is long-term with deeply rooted issues that are seen as "non-negotiable".
- ✖ Something that is non-negotiable is set within the mind and the process of changing such thoughts is difficult, if not impossible. The distinction is that reason and communication do not always address the issues present within a conflict, but will generally work towards alleviating many disputes.
- ✖ If left unchecked and unexplained, a dispute can easily turn into a conflict. But conflicts rarely revert to disputes without intervention. When multiple disputes and arguments are left to fester the result can often lead to conflict. Within the nature of a conflict each side is fundamentally opposed to the success of the other and will not compromise their own values at the risk of allowing those they despise to achieve even the slightest victory.
- ✖ Costintino and Merchant define conflict as the fundamental disagreement between two parties, of which a dispute is one possible outcome. (Conciliation, conflict avoidance, or capitulation are other outcomes.)
- ✖ Douglas Yarn: conflict is a state, rather than a process. People who have opposing interests, values, or needs are in a state of conflict, which may be latent (meaning not acted upon) or manifest, in which case it is brought forward in the form of a dispute or disputing process. In this sense, "a conflict can exist without a dispute, but a dispute cannot exist without a conflict."
- ✖ Dispute settlement is a temporary settlement of an immediate problem; conflict resolution is a long-term settlement of an underlying long-running conflict.

6.5.9 Difference between Mediation, Adjudication, Arbitration and Litigation

	Mediation	Adjudication	Arbitration	Litigation
Definition	Negotiation with mediation of a third party (the mediator)	Disputes submitted to an adjudicator for binding decision unless substituted by arbitration /litigation	Disputes submitted to an arbitrator for a binding decision	Process of making a civil claim in a court of law
Time	Generally 1-2 days for simple cases	Much shorter than arbitration and litigation, normally 30 days to decide	May take months/years. Procedure to be agreed by parties	Longest period due to backlog of cases in court
Cost	Lower than arbitration	Lower than arbitration cost	Higher than mediation,	Expensive because it

		because of faster hearing	can be higher than litigation case	takes a long period
Confidentiality	Private	Private unless decision enforced through court	Private but may become public if court intervention	Public, judgment reported
Formalities	Very informal	Less formal than arbitration	Less formal than litigation	Formal, rigid, strict evidential
Involvement of third party and control by parties	Mediator, facilitates the process but parties control content and outcome	Adjudicator controls content and outcome of proceedings; parties control choice of adjudicator and process	Arbitrator controls content and outcome of proceedings; parties control choice of arbitrator and process	A judge controls outcome of proceedings, parties have no control over choice of judge and legal proceedings. Difference between Mediation, Adjudication, Arbitration and Litigation
Remedies	Wide ranging, by assistance of mediator, creative remedies possible	Monetary remedies only usually. Adjudicator's decision on non-monetary issues not binding	More restricted, must be a legal, creative remedies not possible	Strict, only legal remedies, creative remedies not possible
Degree of parties satisfaction with outcome	High; parties work together to reach a win/win outcome	Low because decision imposed by adjudicator, win/lose outcome	Medium; outcome because decided by arbitrator	Low because judgment imposed by court; win/lose outcome
Communications	Mediator usually	Parties participate in	General prohibition	Strict, ex-parte

	communicates with one party without the presence of the other	proceeding. May precede ex-parte if respondent doesn't participate. Legal representation is allowed	against ex-parte communication	communication with judge allowed, parties communicate through lawyers
Effects on relationship	Preserves relationship	May destroy relationship	May destroy relationship	High chance of destroying relationship
Certainties of achieving settlement	More certainty of achieving settlement than in arbitration	Certainty in getting decision. Decision may be replaced by arbitration/litigation	Certainty in getting an award at the end of the arbitration	Certainty in getting a judgment at the end of trial

6.6 EXAM SOLUTION

1. **Globalization has been an open opportunity for developing country. It helps transfer technology and development process but also a culture that loosens confidence on nationality. How can people work for development within their own culture with others as guide? Explain.** **[2070 Bhadra; W: 10]**

Ans: See the definition part 6.1.1

2. **How the PPA models help in any development activities? What is its significance in a developing country like Nepal?** **[2071 Bhadra; W: 5]**

Ans: See the definition part 6.2

3. **Write short notes on: PPA** **[2071 Magh; W: 4]**

Ans: See the definition part 6.2

4. **Write short notes on: Conflict and dispute management** **[2072 Ashwin; W: 4]**

Ans: See the definition part 6.5

5. **Explain in detail the public private partnership.** **[2072 Magh; W: 5]**

Ans: See the definition part 6.2

6. **How do you resolve conflicts and disputes arising in professional practice?** **[2072 Magh; W: 5]**

Ans: See the definition part 6.5

7. **Explain globalization and cross cultural issues.** **[2073 Bhadra; W: 4]**

Ans: See the definition part 6.1.1 and 6.1.2

8. **Define globalization and PPP. What are level and sources of conflict in the organization?** **[2073 Magh; W: 4]**

Ans: See the definition part 6.1.1 and 6.5

9. **Explain globalization and cross culture issues.** **[2074 Magh, W: 6]**

Ans: See the definition part 6.1

10. **What do you understand by the public private partnership in Nepal? What are the methods to resolve the conflict?** **[2075 Bhadra, W: 2+3]**

Ans: **For the first part**

See the definition part 6.2

For the second part

See the definition part 6.5.5

11. **What do you understand by development and environment? Briefly explain while developing, environment becomes changed. Discuss the dispute resolution process.** **[2075 Magh]**

Ans: **For the first part**

See the definition part 6.4

For the second part

Following are the dispute resolution process practices in the Nepal as per PPA – 2063 and PPR – 2064:

As per PPA and PPR, if there is a dispute between an employer and contractor in a construction contract, firstly it is resolved through amicable settlement (*i.e.*, negotiation). If not possible from amicable settlement then the dispute can be resolved from either arbitration or dispute resolution board depend upon the governing law of the country. Following are the methods of dispute resolution (sequentially) in practice:

vi) Amicable Settlement (Negotiation)

Amicable settlement clause includes the agreement that if a cause for a dispute should arise between a contractor and a project owner, these parties will attempt to reach a just and satisfactory resolution between themselves before moving on to other means. It is the most effective way of dispute resolution.

vii) Mediation

A mediation clause suggests the inclusion of a neutral third party in the dispute situation to help mediate the process of resolving the dispute. Mediation is not legally binding in any way, but can be an effective way out of a situation, which could otherwise deteriorate.

viii) Adjudication

The adjudication method also includes a neutral third party but unlike with the mediation method, the adjudicator will give a decision, whereas the mediator will assist parties in finding the resolution. Adjudication clauses typically also include the possibility of applying to a court to enforce the adjudicator's decision, if the dispute is not resolved by the decision itself. It is a cost-efficient method, which helps operations proceed while the dispute is resolved. The DAB: is the dispute adjudication board, there is either one or three member.

ix) Arbitration

If parties decide to go for arbitration, they will again have a neutral third party enter the situation to help resolve it. In arbitration, parties agree to the arbitrator who has the relevant experience to engage in the matter. The arbitrator considers documents and facts that concern the situation, and can make a decision that favors one side if the parties fail to achieve consensus. Arbitrations can be

legally binding, depending on the jurisdiction. The costs of arbitration can be significantly higher (the cost share by the both parties) than that of other methods, sometimes even as high as legal proceedings.

x) Litigation

Litigation involves the disputing parties going into court to have a judge or jury decide the matter for them.

12. What are the risk factors in public private partnership projects? What are the methods to resolve dispute? [2076 Bhadra, W: 4]

Ans: For the first part

See the definition part 6.2.1

For the second part

See the solution of Q. no. 11

13. What challenges of globalization do you see on engineering profession? [2077 Chaitra; W: 4]

Ans: Although globalization will lead to greater opportunities and access to world markets, there are several challenges facing the globalization of engineering profession which is discussed below:

A. Challenges for Professional Engineers

- Globalization will lead to increased competition in the workplace as companies will be seeking highly skilled and competent employees which limit the chances of getting employed and become threat for engineers.
- Engineers face the challenge to be acquainted with the latest technology that is applicable in the workplace. Similarly, they need to more innovative to compete internationally and also need to be in touch with the technological changes in the world.
- Engineers also face the challenge to learn how to associate with employees from different socio-cultural backgrounds to avoid conflict in the workplace. Language and cultural barrier affects the effectiveness of engineers working in an organization and they need to have better communication and interpersonal skills to socialize with colleagues with different cultural backgrounds.

B. Challenges for Engineering Sector and Policymakers

- The licensing procedures for engineers can vary considerably from considerably from country to country. Due to the differences or lack of licensing procedures for engineers between countries, the development of international licensing procedures will be challenging.

- Another challenge for the engineering sector is the development and enforcement of international standards. These standards are important to enhance the trade of services and products, to strengthen public and private partnerships within countries around the world and to promote global health and safety.
- As engineering becomes more globalized, there is a need to develop a global code of ethics that can apply to a variety of professions in engineering. Similarly, the need to consider the professional engineer's responsibility to society is increasing. The issues related to engineering ethics need to be discussed and regulated on a global scale.
- With increased globalization, the role of engineers will change significantly. It is important for the engineering community to recognize its role in developing and negotiating international trade agreements involving engineering services as well as preparing the future generation of civil engineers to meet the challenges of a globalized world.

14. How the PPP models help in any development activities? Write down the merits and demerits of globalization for developing countries like Nepal. [2078 Chaitra; W: 4]

Ans: For the first part

See the definition part 6.2

For the second part

Merits of Globalization for Developing Countries

i) It allows developing countries to catch up to industrialized nations through increased manufacturing, economic expansion and improvements in standards of living.

ii) In developing countries, there is often a lack of capital which hinders economic growth and development. Due to globalization, capital is being shifted to the developing countries resulting in more job opportunities.

iii) Globalization enhances cooperation in the sectors of healthcare, education, defense, etc. and provides access to trade and commerce worldwide with affordable commodities rates.

Demerits of Globalization for Developing Countries

i) Developing countries may be too much dependent on the developed countries in terms of import but their export capabilities may be lower. It increases the trade imbalance or trade deficit.

ii) Wealthy, industrialized nations sometimes enter trade agreements with developing countries in order to exploit weak labor and environmental laws. Lack of environmental regulations allows developed countries to import resources such as precious metals at lower prices. This results in both lasting environmental damage and human rights abuses.
iii) It can increase unemployment rate since it demands higher-skilled work at a lower price.
iv) There is a threat to sovereignty and socio-cultural values for the developing countries.

15. Write short notes on: Conflict and Dispute Management. **[2078 Chaitra; W: 4]**

Ans: See the definition part 6.5

16. Why is dispute management in any project necessary? Write its reasons and your solutions. **[2079 Jestha; W: 5]**

Ans: **For the first part**

Dispute management is necessary for any project to ensure successful completion of a project within allocated time and budget. Disputes can damage the relations between members in a project and also affects the quality of projects.

Importance of Dispute Management

i) Managing disputes ensure the project moves in a viable and sustainable manner while maintaining value for money. It saves a lot of time and resources for the project manager.
ii) It helps to bring stakeholders and members of a project into alignment on the objectives, success criteria, project description, milestones and other elements of a project, which increases the overall productivity.
iii) Employees can concentrate on their works and dispute management strengthens relationships among groups and individuals. The morale increases with the sharing of ideas within the team members and it ultimately enhances the quality of projects.

For the second part

See the solution of Q. no. 11

Chapter 7

CASE STUDIES BASED ON ENGINEERING PRACTICES

1. During quality control visit in a remote village, it has been found that a building is being constructed on the bank of river, and it will be damaged due to flood. Approximately 20% of the construction was completed. The survey was done by your friend with the consent of the local people. However, the quality of construction was as per specification. Your job is limited to control the quality of the building only. Discuss the case and recommend your views on whether to continue the construction or not.

Solution:

I will recommend to stop the construction work despite the work is running according to specs. Though there are several measures to mitigate the flood, the building which is constructed near bank of river is always vulnerable to damage and possibility of washed away. So rather taking risk, it is better to stop the construction work although the 20% work has been completed. Money must not and won't be a prime and important factor as compare to human life and safety.

Surveyor as my friend should not have design the building in such a vulnerable area. He should have convinced the public (despite the consent given by people) regarding the possibility and scale of damage to be abided by the village people. He should be aware of his professional code of conduct and liabilities of his duty. It is also a fact that characteristics and its flow pattern of the flood are well known by surveyor than village people.

Surveyor conducts shall be deal with following context:

Tips

Professional practices are concerned with public safety, welfare of all persons and for the physical environment affected by their work and also subjected to public evaluation.

2. **Er. Prakash Dhakal was working as a project engineer in a road project in Gorkha. Er. Sanjeeb Sharma, close friend of Prakash was also working as site engineer in the same project for a construction company. Construction was in full swing. Prakash and Sanjeeb were tired every day after the work. Almost every day, Sanjeeb proposes Prakash for drinks and good foods in the restaurant after work. After few days of work Prakash noticed that the ratio of cement mortar used in the stone masonry was 1 : 7 instead of 1 : 4 as per design. Similarly, there was 1 : 2 : 4 ratio of mixture instead of 1 : 1.5 : 3 as per design in the PCC and R.C.C. works. Prakash complained of this and asked for the reason. Sanjeeb told to Prakash that the strength required for the construction is still safe in the mortar of 1 : 7 and concrete of 1 : 2 : 4 and also this is only the means to cover the overheads of entertainments and other financial benefits, Sanjeeb did this. As this action does not affect the quality of work, Sanjeeb requested Prakash to stay silent on this matter and assured Prakash that he would be responsible for all the consequences arising if any. How would you judge the role of Prakash and Sanjeeb in ethical ground?**

Solution:

Role of Prakash and Sanjeeb in ethical background:

Tips 1: Role of Sanjeeb

- Engineer will not attempt to injure falsely or maliciously professional reputation, prospects or practice of another engineer.
- Similarly, engineer should practice their work within their realm of expertise, they do so in a fair and ethical manner, and they should place the good of society above their personal gain.
- Professional engineer shall not be engaged in activities or accept remuneration for services rendered that may create a conflict of interest with their clients or employers, without the knowledge and consent of their clients or employers.
- With reference to above ethical scenario, Sanjeeb fails to do so and his act seems to be unethical and immoral.

Tips 2: Role of Prakash

- If Engineer has proof that engineer has been unethical, illegal or unfair in his practice, he should be advised to proper his practice of authority.

- Similarly, engineer should practice their work within their realm of expertise, they do so in a fair and ethical manner, and they should place the good of society above their personal gain.
- Professional engineer shall not be engaged in activities or accept remuneration for services rendered that may create a conflict of interest with their clients or employers, without the knowledge and consent of their clients or employers.
- Regarding above ethical scenario, Prakash should advise and request Ramesh to be ethical and practice his authority properly.

A factory was using a chemical in making a product. The storage tank of the chemical waste, which was hazardous to health and environment, had a leakage. During inspection Er. A came to know leakage that had already taken place that might cause adverse impact on health and hygiene of the surroundings. You informed your boss about the event. Considering the possible social objection, he requests you to be silent on the issue and also hints you that you may have to be out of the job if the case would go into the hands of social reformers. If you were Er. A, what you would do? Discuss.

Solution:

Tips 1

Engineering, more than any other profession involves social experimentation. Often one engineer's decision affects the safety of countless lives. It is, therefore, important that engineers constantly remember that their first obligation is to ensure the public's safety.

Tips 2

Engineering is a profession. A profession is that which is acquired through a specialized training or education having certain skill those ordinary men does not poses. Because of professional's knowledge and skill that ordinary people do not possess and because of they use their knowledge and skill for the benefit of people and society as a whole, professionals do have high recognition in the society. Furthermore, their professional practices are also subjected to public evaluation and hence a professional's work cannot be remained as a personal matter.

Tips 3

Professional engineers shall have proper regard in all their work for the safety and welfare of all persons and for the physical environment affected by their work.

Tips 4

Fundamental ethical values of code of ethics, which are universal in practice: Protection of life and safeguarding people; sustainable management and care for the environment.

Tips 5

Professionals committing unethical/immoral acts are subjected to a disciplinary action if not institutionally (as in case of Nepal) but by the public and their public image will become very low.

Tips 6

With reference to above discussions, I will be ready to quit the job, but I won't stay silent on that case which is hazardous to public and environment.

4. **You are appointed as a consulting engineer in a project where your best friend is supplying material. The community people knew the fact and asked you to quit the job because you cannot control the quality of the material. How do you cope with this situation? Discuss ethical aspects related to this situation.**

Solution:

Tips 1

Professionals are bound by code of ethics. They are not free to act as what they desire. Personal and professional behaviors are controlled by code of ethics prepared by professional association/societies.

Tips 2

Professional engineers shall acts for their clients or employers as faithful agents or trustees and also act independently and with fairness and justice to all participants.

Tips 3

With reference to above ethical aspects and background, situations have to be dealt. I will convince the community that whoever supplies the material, it does not matter. Quality of material will always be thoroughly checked/verified/tested/measured in accordance to specifications provided to supplier. Regardless of these logic, if community does not convince, with due respect to my profession I will quit the job.

5. **A trial bridge (suspension bridge) over the Bheri river at Shubhaghat near Mehalkuna bazaar of Surkhet district collapsed on 25th December, 2017. The collapse of the bridge claimed some 25 people's life and it is speculated that about 85 persons are missing in the Bheri River. The mishap happened while a large crowd of people (some eye witnesses claims 400 to 450 persons) were crossing the bridge to participate in a local fair on the other side of the bank. The bridge is located at about 10 Km Northeast from the Chhinchu bazaar. The span of the bridge was 185 meters and was completed construction in the fiscal year 2073/74 (July 2016/June 2017). This was constructed by DDC-Surkhet, supervised by DTO- Surkhet and the consultant was PACE Consultant, Kathmandu. The contractor was the DC Nirwan Sewa, Nepalgunj. The fabricator of all the elements of the bridge was Hulas Steel Industries, Simara. Nepal government has announced to conduct detail investigation of the incident. Initially, it was assumed that the bridge failed due to overload. Prior to the incident, the DTO technician had allegedly instructed the contractor to tighten up the nuts of the bulldog grips of the main cables. The Chairperson of the Fair Management Committee has been quoted to say that the contractor has not tightened the nuts as was required. Preliminary investigations by the SBD engineers seem to indicate that the bridge failed due to faulty bulldog grips. How would you judge the incident on the ground of professional ethics?**

Solution:

On the ground of professional ethics, the culprits of the incident have been mentioned in prime order as below:

Tips 1

Consultant: Professional engineers shall have proper regard in all their work for the safety and welfare of all persons and for the physical environment affected by their work. On this ethical background, consultant should thoroughly verified/supervised/checked each and every aspect of the constructional activities and should instructs concerned contractor to rectify faulty works/design immediately otherwise works should be stopped instantly. This does not seem to be happened.

Tips 2

Supervisor–DTO: Since professional practices are concerned with public safety, welfare of all persons and for the physical environment affected by their work and also subjected to public evaluation, Supervising office seems to be unaware of problems regarding nuts of bulldog grips on time.

Tips 3

Contractor: Contractor should have followed the instructions and tighten up the nuts of bulldog grips immediately. But this action seems to be lack.

Tips 4

Owner: Having knowledge of technical/design fault in the construction of bridge, owner should not have opened the bridge to the public unless the rectifications have been completed.

6. **In a construction project for which you are the consultant's supervising engineer, the contractor requests you for preparing his running bill of works done and assuring you to pay a**

handsome amount for your work, as his engineer recently quit the job. How should you respond? Explain your arguments. Write five most important rule of conduct for a professional engineer considering code of ethics prevalent in Nepal.

Solution:

Tips 1

Professional engineer shall not be engaged in activities or accept remuneration for services rendered that may create a conflict of interest with their clients or employers, without the knowledge and consent of their clients or employers.

Tips 2

Professional engineers shall acts for their clients or employers as faithful agents or trustees and also act independently and with fairness and justice to all participants.

Tips 3

With reference to above ethical aspects and background, I will not prepare the running bill for the contractor. If I intended to prepare, it will be against code of ethics and immoral and may be viable for liability.

Tips 4

Most important rule of conduct for professional engineer:

- Public safety and welfare
- Competence and knowledge
- Sealing and signing
- Faithful agent and trustee
- Conflict of interest

7. **Both Mr. Pawan Shrestha and Prakash Gajurel, consultant engineers, applied on the floor of the building during their inspection visit, which was under construction, causing serious injury. During investigation it was revealed that the floor was not constructed as per design and specification making it slippery. The flooring work was subcontracted to Mr. Ram on Mr. Pawan Shrestha's recommendation. Who is to blame? Give reasons.**

Solution:

Mr. Pawan Shrestha should take responsibility for the incidents with reference to the following ethical backgrounds.

Tips 1

Professional engineer shall have proper regard in all their work for the safety and welfare of all persons and for the physical environment affected by them.

Tips 2

Lack of proper inspection and supervision.

Tips 3

Professional engineer shall not be engaged in activities or accept remuneration for services rendered that may create a conflict of interest with their clients or employers, without the knowledge and consent of their clients or employers.

8. **A R.C.C. bridge was designed by the designer on behalf of consultant. This was constructed by the reputed "A" class contractor. After the completion of the construction, traffic was allowed on the bridge. After six months of operation there were cracks in the bridge. A probe team was established by road department. The design procedure was okay, but it was found that the quality of steel material used was not duly tested. The contractor argued that the procedure of construction was in accordance with the instruction of engineer and specification, however, the workmanship was found not as per specification. There was also lack of proper supervision by the consultant. The design load for the bridge was 25 tons. It was also reported that there happen to pass more than 25 tons vehicles also. The consultant was good friend of contractor. Being a member of probe team, what is your judgement on the failure of this bridge?**

Solution:

Being a member of a probe team, major responsibility for the failure of R.C.C. bridge must be taken by both consultant and contractor, which will be my verdict on the following ethical and practical aspects.

Tips 1

Professional engineers shall have proper regard in all their work for the safety and welfare of all persons and for the physical environment affected by their work. On this ethical background, consultant should thoroughly verified/supervised/checked each and every aspect of the constructional activities and should instructs concerned contractor to rectify faulty works/design immediately otherwise works should be stopped instantly. This does not seem to be happened.

Tips 2

Contractor should have followed the detailed specification instructions regarding workmanship and other necessary details.

Tips 3

Professional practices are concerned with public safety, welfare of all persons and for the physical environment affected by their work and also subjected to public evaluation.

9. **Engineer Rabin Khadka was working with the contractor in the CE construction project (say construction of multi-dimensional underground business complex in Pokhara). You were given responsibility to control quality of work in the site. The construction company had maintained confidentiality of the incentives and salary of employees and the state of quality of work as a management tool. One day, Rabin happens to come to the office of executive engineer Damodar, from site. Er. Damodar was not in his office. While waiting for Er. Damodar, Er. Rabin went through the computer of executive engineer. He opened entire confidential file of incentives and salaries of employees in the computer. He found differences in the level of salaries and incentives to different employees. In the meantime, Er. Damodar came to his room and found Rabin looking confidential file on the computer. Sudhir was not happy with Rabin for this act. How do you judge the conduct of Rabin in the ethical ground? How should Damodar react with Rabin for this behavior?**

Solution:

I think conduct of Rabin was unethical and immoral with respect to ethical practices as summarized below. Damodar should respond it seriously and he should advise, instruct and guide Er. Rabin regarding the ethical practices mentioned below immediately so that those sorts of incidents never happen again.

Tips 1

- Professional engineer shall take care that credit for engineering works is given to those directly responsible for.
- Engineer will not attempt to injure falsely or maliciously professional reputation, prospects or practice of another engineer.
- Similarly, engineer should give due regards to all professional aspects of the engagement Professional engineer will not review the work of other engineer for the same client except with the knowledge of such engineer.
- Engineer shall not disclose confidential information without the consent of their clients or employers, unless the withholding of information is considered contrary to the safety of the public.

10. **You are working as an engineer from a consulting firm in Kathmandu. Your friend Mr. Surendra is working as a project engineer from contractor in the same project. Mr. Surendra invites you for dinner every Friday to celebrate 'good Friday' and requests you to share the guesthouse for your accommodation. What would you do? Prepare a case study based on code of ethics. Make supplementary assumptions if necessary.**

Solution:

I will reject the offer and invitation on following ethical scenario.

Tips 1

Professional engineer shall not be engaged in activities or accept remuneration for services rendered that may create a conflict of interest with their clients or employers, without the knowledge and consent of their clients or employers.

Tips 2

Professional engineers shall acts for their clients or employers as faithful agents or trustees and also act independently and with fairness and justice to all participants.

11. **Er. Prasant Paneru was working with the contractor in a construction project (say construction of housing complex in Kathmandu). He was given the responsibilities to control the quality of work in the site. Incidentally, material supplier (Ram) in the construction is a friend of Prasant. Owing to the road blockade and other strikes, Ram was facing difficulty in supplying sand and aggregates as per the given specification. Sand and aggregate materials was available in the close proximity of the site, but it is slightly substandard. Ram requested Prasant to allow this material to be used for construction. Ram convinced Prakash that the strength of concrete shall be produced as per specification even with the use of substandard materials. Ram also offered to share 50% of the cost saved during this process. How do you judge the conduct of Prasant and Ram on an ethical ground?**

Solution:

I think conduct of Prasant was unethical and immoral as he was convinced with Ram regarding technical aspects. If Er. Prasant shares 50% of the cost saved due to supply of substandard sand and aggregate materials then, it would also be an unethical and breaching the code of ethics issued by concerned authority. The conduct of Er. Prasant can be dealt in the prospects of context summarized below.

Tips 1

Professional engineer shall not be engaged in activities or accept remuneration for services rendered that may create a conflict of interest with their clients or employers, without the knowledge and consent of their clients or employers.

Tips 2

Professional engineers shall acts for their clients or employers as faithful agents or trustees and also act independently and with fairness and justice to all participants.

Tips 3

Professional practices are concerned with public safety, welfare of all persons and for the physical environment affected by their work and also subjected to public evaluation.

In case of Ram, his approach and behavior are more unethical and his activities reflect that he is not concerned over public safety and welfare. On above issue, it is not clear whether Ram is an engineer or not. If Ram is an engineer, then his conduct can be dealt with reference to code of conduct and code of ethics and conclusion will be drawn that his conduct is unprofessional and unethical and he is not aware of his engineering skill and knowledge.

12. Er. Novel was a site supervisor for a construction company. He saw improper construction procedures, use of wrong materials and untrained workers. So, he reported the manager about the situation. But the manager ignored and fired him. What should Er. Novel do further? Discuss the rightness and wrongness of this case. [2077 Chaitra; W: 4]

Solution:

Rightness of the case

Even though Er. Novel got fired for speaking against the unethical practices going on in construction to the manager; he adhered to the code of ethics and showcased his professionalism. The rightness of this case is justified by the following clauses:

Clause 1

Professional engineers shall act for their clients or employers as faithful agents or trustees.

Clause 2

Professional engineer shall have proper regard in all their work for the safety and welfare of all persons and for the physical environment affected by their work.

Wrongness of the case

The manager is compromising on the quality of construction works and neglecting public safety through the use of wrong materials, untrained workers and improper construction procedures.

Suggestion:

Er. Novel should take the following actions regarding the case:

Tips 1

Er. Novel should play the role of a whistle-blower and expose the truth of illegal and unethical construction practices going around to the media, social reformers and public authorities.

Tips 2

Er. Novel should register complaint to CIAA for investigating the case as there is huge possibility of substandard work practices to have been caused by corruption involving manager or other members in the company.

13. You are working as an engineer from a consulting firm in Gorkha. Your friend Mr. John is working as a project engineer from contractor in the same project. Mr. John invites you for dinner every Saturday to celebrate a weekend and requests you to share the guest house for your accommodation. What would you do? Prepare a case study based on code of ethics. Make supplementary assumptions if necessary. [2078 Chaitra; W: 4]

Solution:

I will reject the offer and invitation of Mr. John based on the following ethical scenario:

Tips 1

Engineers should have strict professional relation with their fellow engineers despite their status and relationship.

Tips 2

Professional engineers shall not be engaged in activities or accept remuneration for services rendered that may create a conflict of interest and reject bribery in all its forms.

Tips 3

Professional engineers shall act for their clients or employers as faithful agents or trustees.

Response to the case

Based upon above ethical scenarios, I would suggest my friend John to be more ethical in his profession and help him in his professional development so that he practices the profession with loyalty and dignity.

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