UNIT - II → Population And Conservation of Ecology

Q.1. What is population and what are its characteristics?

Ans. Population:

The term population is derived from a latin word 'populus' meaning people and originally it referred to a group of people occupying a particular area. Ecologically population can be defined as a group of individuals of the same species occupying a particular area at a given time e.g number of students in Hanifa Model School Lajurah on a particular day, Lions in a Gir forest in 1990 etc. According to MC Naughton (1973) populations are groups of genetically similar individuals co – occurring in space and time. In 2011, population of India was 1210726932. In ecology a population is always mono – specific (population of individuals of same species) and it changes from time to time.

Characteristics of population:-

Following are the important characteristics of a population:

a. **Population size:-**It is the total number of individuals consisting a population and is denoted by N. In India, human population size was 843,9 million in 1991 and 1027.015 million in 2001. Hence population is a varying entity.

b. **Population Density:-**The size of a population in relation to unit space is called population density e.g 200 almond trees per hectare of land, 20 students in class 3rd in Hanifa Model School Lajurah, etc. Population density has two types viz:
   i. ***Crude density:*** it is the number of individuals per unit area.
   ii. ***Ecological Density:*** it is the actual area of the habitat available to species.

In 1991 population density of India was 267 persons/sq.km, in 2001, population density was 324 persons per sq.km, while as in 2011, it was 4000 / sq.km

c. **Population Growth:** It is determined by number of individuals added to the populations (by births and immigration) and number of individuals lost from the population (by deaths and emigration). There are three forms of population growth:
   i. ***Positive Growth:*** When more individuals are added than lost e.g in India.
   ii. ***Negative Growth:*** When more individuals are lost than added e.g in Australia, Japan.
   iii. ***Zero* Growth:** When number of individuals added is equal to the number of individuals lost e.g in Sweden, Germany.

d. **Age Structure:** Individuals in a population are of different ages and the distribution of individuals in each age group (young, adult and old) is called age structure.

e. **Sex Ratio:** It refers to number of females in a population per thousand males. In India, in 1991, sex ratio was 929:1000 and in 2011 it is 941:1000.

f. **Life Tables or Mortality table:** A life table is a table of statistics giving information related to average probability of survival or death at different ages remaining life expectancy and the proportion of the original birth cohort still alive. Life table provides us clear and systematic picture of mortality and survival. It helps us to estimate the growth and decline of population.

g. **Dispersion:** Dispersion is the movement of individuals in a population relative to one another. It helps in propagation of population. Individuals are distributed, regularly, randomly or in clumps.

Q.2. What are the various factors that cause population change?

Ans. Various factors that cause population change are given below:

a. **Natality (Birth Rate):-**The birth rate of a population refers to the production of new individuals in the population by birth, hatching or germination per unit time (usually per year). In 2001 the birth rate of India was 24.28 / 1000, while as in 2011, it was 20.22/1000. There are two types of natality viz;
   i. **Potential or Maximum Natality (Physiological Natality):** The maximum birth rate a species can achieve under ideal environmental conditions and biological limit is called Potential – natality.
   ii. **Realized Natality or Ecological Natality:** the actual birth rate under the existing conditions is called realized natality.

b. **Mortality (Death Rate):-**The death rate of a population is the average number of individuals that die per unit time (usually per year). In 2001, death rate of India was 8.74/1000, while as in 2011, it was 7.48/1000. Mortality may be:-
   i. **Minimum Mortality:-** it is the minimum loss under ideal or non – limiting condition. Thus even under best conditions individuals would die of old age.
   ii. **Ecological Mortality Rearized Mortality:-** It is an actual loss of individuals under a given environmental condition such as disease, predation etc.

c. **Emmigration (Outward Movement):-**It is the permanent departure of some persons from the existing population of a region to different state or a foreign country e.g many Indians went to Arabian countries to settle there. Due to emigration, the size and density of a given population decreases.

d. **Immigration (Inward Movement):-**It is the permanent arrival of some persons to the existing population of a region or region from outside e.g many Bangladesi have come to India and settle here. Due to immigration, there is increase in size and density of a population.

Q.3. What is age structure (Age composition) and give its significance?

Ans. Age structure.

Age structure is also called as age distribution. In any population individuals are not of same ages but having different ages. The proportion of individuals in each group such as young, adult and old is called as age structure of a population. Bodenheimer (1938) recognized three ecological ages, namely pre – reproductive, reproductive and post reproductive ages. Duration of these ages varies in different organism. The pre – reproductive age includes the individuals from 0-14 years of age, reproductive age includes the individuals from 15 – 44 years and the post – reproductive age includes the individuals from 45 or above. Generally rapidly increasing population will have large percentage of young individuals while as stable population will exhibit even distribution of age group but in declining population, mostly post reproductive individual will predominate.

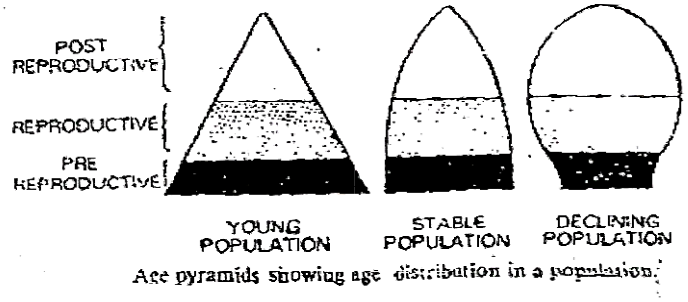
Q.4. Describe Age Pyramids?

Ans. The model representing geometrically the percentage of different age groups in the population of any organism is called age pyramid. There are three hypothetical pyramid types which are given below one by one:-

i. **A pyramid with broad base:-** It indicates the high percentage of young individuals. In this age pyramid base forms young individuals middle part indicates adult individuals while as the upper part indicates old individuals. Since large number of young individuals will enter into the reproductive phase, thus causing an increase in the population. It is found in fungi, Housefly, protozoan etc.

ii. **Bell Shaped Polygon:** It indicates moderate percentage of young to old individuals. Here post – reproductive individuals remains low in percentage and other two groups are nearly equal in size indicating stable population.

iii. Urn Shaped figure: It is almost urn – shaped pyramid indicating low percentage of young individuals. Due to decrease in birth rate, the populations tend to be dying off.

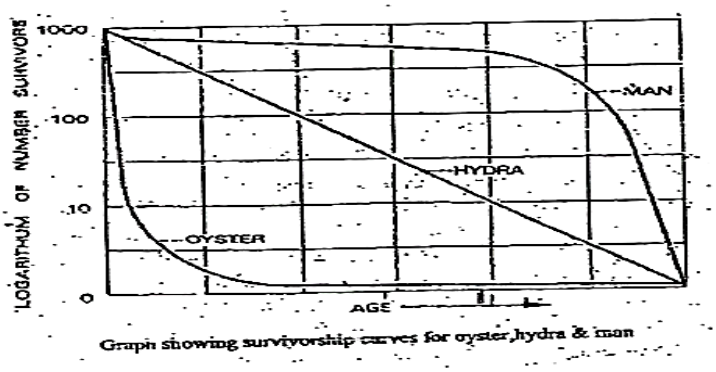


Age pyramids showing age distribution in a population.

Q.5. What are different types of survivorship curves that are possible on the bases of survivorship and age? Discuss.

Ans. A survivorship is a curve or graphic representation, which plots the number of surviving individuals to a particular age. The patterns of survival rates are generally expressed by survivorship curves. It is obtained by plotting the number of individuals of a particular age surviving on the vertical axis against time, taking time interval on the horizontal axis. Pearl (1928) recognised three types of survivorship curves which are explained below:

i. Convex Curve: Here the individuals tend to live out their life span. They possess high degree of survival at all age but have heavy mortality at the end of their life span e.g, man, deer, mountain, sheep, elephant, whale, bear, rabbit etc.



Graph showing survivorship curves for oyster, hydra & man

ii. Concave Curve: This type of curve is shown by animals or plants like oyster, oak tree, fish and invertebrates. In such species mortality rate is very high during early stages.

iii. Diagonal Curve:- This type of curve is shown by organisms like hydra, birds, rodents and plants. Here the mortality rate is constant at all ages. And the curve approaches a diagonal straight line.

Q.6. What do you mean by r and k selection (strategy) and give difference between the two?

Ans. According to M. Arthur and Wilson in 1967 populations are the outcome of either r selection or k selection. r selected populations have high intrinsic rate of growth and tend to boom when the environmental conditions are favourable and when those conditions deteriorate as a result they exhibit large fluctuations in density and have potential for large genetic change through the effect. On the other hand k selected population have relatively constant density at or near the carrying capacity of environment?

Difference between r and k selection:-

r selection	k selection
The survivorship curve is concave.	The survivorship curve is convex.
The environment is variable and unpredictable.	Species live in stable or predictable environment.
These are small sized individuals.	These are large sized individuals.
These have wide/high dispersal power.	These have lower dispersal power.
There is low level of social organisation.	There is high level of social organisation
They allocate more energy to reproduction and less to growth maintenance and adaptation.	They allocate more energy to non – reproductive activities.
Species are short lived.	Species are long lived.

Q.7. What is Malthus theory of population growth? Give its limitations.

Ans. In 1798, an English economist Thomas Malthus put forward a theory of human population growth and published it in his work "Essay on the principal of population". According to him human population grows geometrically or exponentially (1,2,4,8,16,32.....) when unchecked while that of its subsistence (food) grows arithmetically (1,2,3,4,5,6,7 .....). Naturally an imbalance is caused in the population and environment. When the imbalance reaches a certain limit, environmental

factors like famine, epidemics, floods, earthquakes etc. will bring the population to a desired level. Such a population reduction is called as catastrophic control of population. The factors that cause catastrophic control of population are called positive checks by Malthus. He also put forth preventive checks for the population stability which include postponement of marriage and restrain on reproduction.

Limitations of Malthus Theory:

i. Humans have huge capacity to control population growth which tends to decline with rising standards of life.

ii. Most scientists believed that food is not only essential factor for survival but water, clothes and shelter are also essential for existence which Malthus did not mention.

iii. Food production has increased faster than the population due to biotechnology.

iv. Safer and better devices of birth control came into use to reduce population size.

Q.8. What is demography? What does the demographic transition mean? Discuss its various phases?

Ans. Demography:

The term demography is derived from a greek word 'demos' meaning people and graphy meaning to write. Thus the demography is defines as the study of human population in all respects. The central foci are processes of fertility, mortality and migration.

Demographic transition:

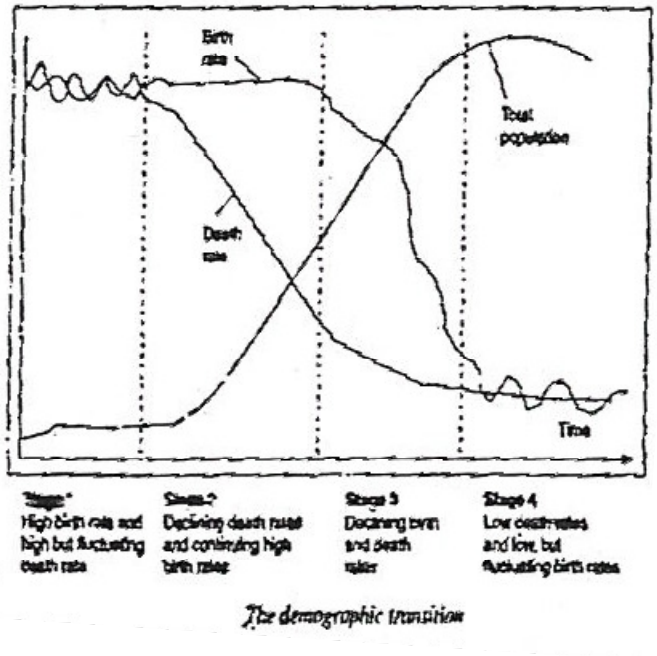
It is a well known fact that, population growth in any country is related to its economic development. Any nation passes through a series of population changes, starting with fall in death rate resulting in population increase, followed by reduction in birth rate and leading to stabilization of population size (When natality rate = mortality rate). Such a phenomenon is called as demographic transition.

Demographic transition takes many decades and it occurs in following four phases:

i. **Stage 1 (Ore – Industrial phase):** It is characterised by high mortality rate and natality rate. High mortality rate is due to non - availability of modern medicinal techniques and high natality rate is due to illiteracy, early marriage etc. It occurred in India before World War I.

ii. **Stage 2 (Transitional Phase):** In this phase there is decline in deaths due to better hygiene and better medical facilities and the birth rate remains high. Population growth begins to increase. It occurred in India till 1971.

iii. **Stage 3 (Industrial Phase):** In this phase there is decline on birth rate due to discouragement by parents to propagate large family. Hence, birth rate getting close to death rate. This stage in India is experiencing since 1971.



The demographic transition

iv. **Stage 4 (post Industrial Phase):** In this stage both birth rate as well as death rate is low and hence there is zero growth of population. This stage occurred in developed countries like Sweden.

Q.9. Describe population growth curves?

Ans. The growth curve is graphical representation of the growth of a population from its beginning till it stabilizes. Such a graph is made by plotting the number of individuals on the y axis and the time on the x – axis.

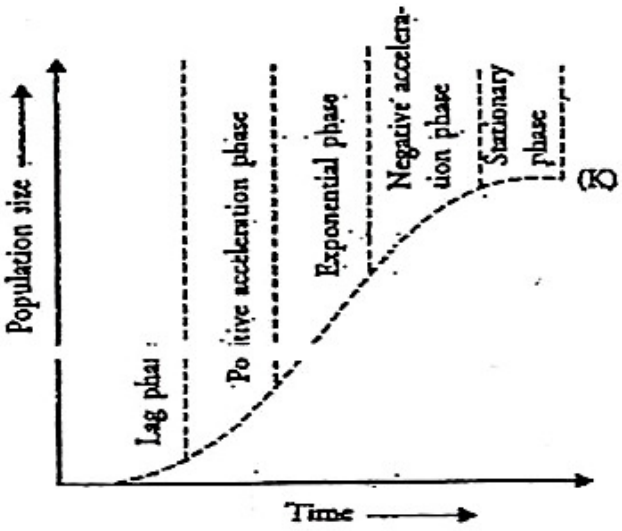
S – shaped growth curve or logistic growth curve:-

It was described by verhulst hence also called Verhulst Pearl growth curve. This type of growth curve is shown by yeast cells grown under laboratory conditions, humans etc. it has five phases.

i. **Lag Phase:** In the beginning small population (yeast cells) adapt itself to the new environment. There is little or no increase in population.

ii. **Positive acceleration phase:** In this phase ii nerearl in population starts but slow in the beginning.

iii. **Exponential phase:** Here rapid increase in population occurs due to constant environment, availability of food and other requirements, no predation and no competition hence the curve rises steeply upwards.



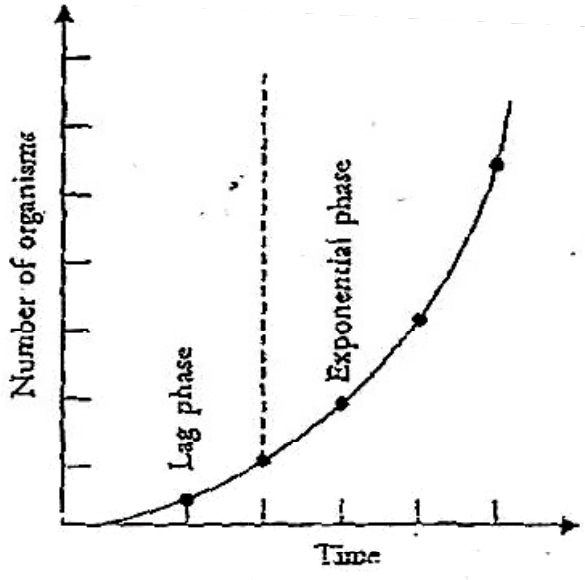
S-shaped sigmoid growth curve.

iv. **Negative acceleration phase:** here growth rate slows down due to increase in environmental resistance (competition for food, space and high death rate etc.)

v. **Stationary Phase:** finally, population becomes stable as there is equal death rate and birth rate. This is achieved when the population reaches the maximum carrying capacity of the area. This is called upper asymptote.

J shaped growth curve:

This type of growth curve was shown by a small population of reindeer experimentally reared in natural environment, insects like mosquito etc. J shaped growth curve has only two phases.



J-shaped growth curve.

i. Lag Phase: There is no significant or low increase in population as the organism is adapting to new environment.

ii. Exponential phase: on becoming adapted to the environment, there is rapid growth in population and it continues as long as food is available. Increase in population resulted in decrease in food. Finally food exhausted and this leads to mass starvation and later mortality. This sudden decline is called population crash.

Q.10. What is exponential growth? Discuss it characteristics.

Ans. Rapid increase in population under favourable environmental conditions is called as exponential growth. It occurs due to availability of food and other requirements and no competition and predation. It mostly occurs in an unoccupied habitat.

As there is no migration of individuals and no motility the natality alone accounts for population changes. Under such condition population growth would be unregulated. So, exponential growth of a population can be expressed in a general growth equation.

$$dn/dt = r\,N \text{ as } r = (bo - do)N$$

where, bo = individual birth rate

do = individual death rate

r = instantaneous coefficient of population growth

$dn/dt = rN$ can be solved to obtain a more useful equation of calculating exponential growth.

$$Nt = N_0 e^{rt}$$

Where, e = universal constant

r = rate of increase

t =unit of time

Characteristics of exponential growth:

1. Number of young ones produced and their survival.
2. Length of fecundity period.
3. As the young ones mature, more would enter in reproductive phase and more offspring would be produced.

4. Growth rate at first is influenced by heredity or life history features like age at beginning of reproduction, number of reproductive seasons in a year etc.

Q.11. How fast has the human population grown in the past?

Ans. In the past, human population was very low and hence under control due to environmental factors like diseases and natural calamities. Modern man (homosapiens) evolved around 25,000 years ago. By A.D 1 only 250 million people were there in the world and by A.D 1,650, it raised up to 545 million. As per historical records, during a period of 13,650 years, it doubled six times. Hence average time required for each doubling was more than 2,000 years before 1900.

Just in 40 years after 1950, the human population doubled from 2.5 billion to 5 billion. It is estimated that world population will reach 8 – 12 billion before the end of 21 century. Every second, it is estimated that 4.5 children are born and 2 people die resulting in adding of 2.5 person per second. It means we are growing by 9000 per hour and about 2, 14, 000 per day.

Q.12. What are the demographic transition trends in India?

Ans. India was in first stage of demographic transition till 1920 when birth rates and death rates were high. Moreover in this stage, there was hardly any industrialization in the country. Famine (1896 - 97) affected large area of the country and was aggravated by severe plague. During (1911 - 1920), country suffered in influenza, epidemic resulted in 7% loss of the total population.

With the beginning of 1920s, second phase of demographic transition started in the country till 1971. This period was marked with industrialization. Death rate lowered due to better medical facilities and during 1921 – 1951, population growth rate increased.

Since 1971, India entered in the third stage of demographic transition. During 1980s there is decline in birth rate.

It has been estimated that there would be faster decline in the birth rates than in death rates in the next couple of decades.

Q.13. Is there a carrying capacity for Homo Sapiens? Discuss?
Or
How many human beings can the supports? Discuss.

Ans. Carrying capacity refers to the maximum number of individuals which the environment (Earth) can support. Human population grows exponentially following J – shaped growth curve. Ultimately, limitations in resources will bring population size to a desired level and hence human population curve will approach to an upper limit or asymptote the carrying capacity and symbolized as K by ecologists.

Q.14. What are the various factors that regulate the size of a population?

Ans. The various factors that regulate the size of population are given below:

i. **Space:** The space is an important and prime factor for the population to grow because it not only accommodates the individuals but also provide life saving resources. More the space available more will be its population size and if there is less space, less will be the population size. If other factors like food, water etc are adequately available but space is less, a number of individuals are eliminated and this reduces the population size.

ii. **Food and water:** Food and water are required for providing important nutrients, energy as well as for operation of metabolic reactions. As long as there is availability of these resources in abundance in a population, it grows exponentially. When there is shortage of food and water, the population size gets decreased. Hence, food and water are the factors that regulate the population size.

iii. **Territories:** Territory is another factor that regulate the population size. Territory is an actively defended breeding area of the habitat occupied by an individual or group of individuals. The boundary of territory is marked with urine, faeces or smell. Territory provides safe

place for mating and rearing young ones. Every individual has it's specific territory. If the territorial size is vast, all pairs would settle on an area to get a territory, and then population would increase. In this case regulation of population will not take place. On the other hand, if territories are small sized, then the number of pairs would be limited. Those pairs who fail to get foot hold in the territory have to leave. This would result in population regulation.

iv. **Predators:** Predators also regulate the size of a population. Predator is an individual which captures and kills the other organism called prey. In simple words, predators are natural enemies which keep the prey population under check. Greater the number of predators less will be size of prey population.

v. **Weather and climate:** Weather and climate also regulate the size of population. These two factors are important for the survival of an individual. The individuals try to adapt to specific weather conditions and climate. The region with favourable climate has a higher population size. The arctic and Antarctic regions are uninhabited by humans due to extreme cold. Similarly desert areas are less populated areas due to dry climate and not fit for agriculture. Sometimes the weather and climate conditions become unfavourable in a region, against the adaptations, this also reduces the size of a population. Hence, favourable weather and climatic conditions increase the size of population in a region while as unfavourable climate decrease the size of a population.

vi. **Parasite and disease:** Parasites and diseases are factors which regulate the size of a population. A parasite is an organism which lives in or on the body of other species (host) getting its food and shelter at the expense of latter. A huge number of parasites in a population can decrease the number of population and low number of parasites can increase the size of population. There are number of diseases which regulate the population size include cholera, typhoid, malaria, plague, small pox, T.B, AIDS etc. Greater the Frequency of

occurrence of such diseases, lesser will be the population size and vice – versa.

vii. **Disaster:** Certain natural calamities or catastrophe like volcanic eruption, earthquake, floods, droughts, tsunamis, snow storms, landslides, epidemics etc. also regulate the population by causing death of number of individuals.

viii. **Self Regulation:** Human beings adapt a number of methods to regulate the size of population. These include vasectomy, tubectomy, use of condoms, with drawl method, calendar method, cap etc. Due to these methods population size is regulated. This phenomenon is called self – regulation. Some people do not marry in order to lower the population size for the sake of nation.

Q.15. Write a note on how family planning and education controls the population size.

Ans. 1. Family Planning: It is a practice in which the parents deliberately keep restriction from producing too many children and hence keep the family size smallest and managing. Family planning is a deliberate effort to limit the family size. Usually one or two children are kept in a family. The family planning can be ensured through following techniques like vasectomy, tubectomy, by using contraceptive pills, diaphragm, condom, intrauterine device and by using calendar method and with drawl method etc.

2. Education: At present, education is the basic tool employed for controlling population. Uneducated people produce a number of children as they are not aware about the consequences of over population. Education keeps the people aware about the advantages of the small family. It keeps the reproductive groups aware about the consequences of large family. The various means of educating people are T.V, Radio, magazines, newspapers, posters, pamphlets etc. Educational institution also plays a role in educating the people. For this, govt. should provide free, compulsory and universal education upto middle class.

Q.16. How economic growth of country leads to control the population? Discuss.

Or

Economic development, the most effective contraceptive for population growth in any country. Discuss.

Ans. It is a fact that, development of any country depends upon its economic growth. In the beginning economic growth accelerates population growth but increased population has negative impact on the rate of economic development due to lack of resource to support the population. People below poverty line produce more children so that they become earning hand and in this way improve the economic conditions of a family. But it goes against the development of country and also the environment due to lack of resources to support the population. A nation is economically sound when it has abundance of resources. It is necessary that the economic status of such people must be improved by setting up more and more industries and factories and by providing suitable jobs and good wages to them. This will then control the population of a country.

Q.17. Can India control its population by empowering its women. Discuss.

Or

How empowering or the status of women can reduce the population growth in India? Discuss.

Ans. In our country, the status of women is low. Out of total India's work force of 314 million, only 90 million are women. As per the census and the national Sample Survey organization in 1991, 86.5% women are unemployed in rural areas 87% rural women are working in building construction, house hold industries and 70% women in rural areas are illiterate. They are considered below standard as compared to men. They are not involved in any decision making process. Moreover they are deprived of education and other fundamental rights. This situation leads to over population as uneducated women are not aware about the consequences of over population. An Indian woman, some decades before could not ask for her husband for keeping smaller family. By improving the women and raising their status can definitely reduce the

population size of a country. Her status in society is the key of the success of population control programme in India. If we do not improve their status, there is no hope of curbing the population growth.

Q.18. Describe various methods of family planning?

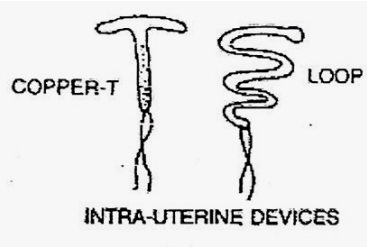
Ans. The various methods of family planning are given below one by one.

1. **Rhythm method or calendar methods:** This method is the abstinence from intercourse during the period of ovulation (releasing of any egg form the ovary) including a few days prior to and after ovulation of the menstrual cycle. Though ovulation takes place on the 14^{th} day of the menstrual cycle the period of abstinence must commence on the 10^{th} day of menstrual cycle and on the 20^{th} day of the cycle. The period from 10^{th} and 20^{th} day of the cycle is known as "danger period" when conception takes place. The first 4 days are characterized by bleeding. The remaining days from 5^{th} day to 9^{th} day (5 days) and from 21^{st} to 28^{th} (8 days) is called "safe period". When there is no chance of conception. Hence, by knowing the safe period one can control the birth.

2. **Condom:** It is a rubber sheath which is rolled over and put on the penis before intercourse. The sperms are caught in it and hence sperm's entry into vagina is prevented.

3. **Diaphragm or cap:** It is a cup shaped thin rubber and is inserted and fitted into vagina before intercourse. It covers the cervix and thus prevents the entry of sperms into the womb.

4. **Intrauterine device (IUD):** These are devices made of plastic or metal objects placed in uterus by gynaecologist. These include copper – T, Lipps, LNG – 20. These prevent implantation.



5. **Contraceptive Pills:** These pills are taken orally (Mala – D, Ovaral , Saheli etc). These contain synthetic hormones like estrogen and progesterone which inhibit and decrease the level of FSH and L.H which in turn inhibit ovulation and implantation.
   Emergency contraceptive pills like I – Pill, unwanted 72 etc, are taken orally after unprotected sex within 72 hours.

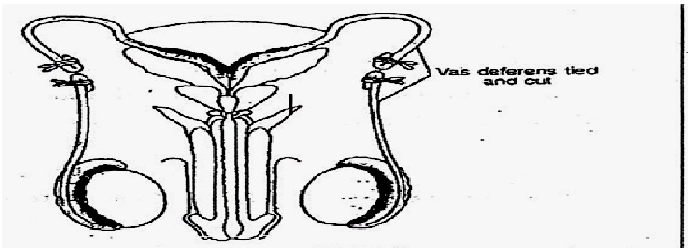
6. **Coitus interruption or withdrawal method:** it is practiced by men in which penis is withdrawn before the discharging of sperms. Hence there is no entry of sperms into vagina.

7. **Chemical method:** foam tablets, jellies, pastes, creams is introduced into the vagina before coites. These kill the sperms.

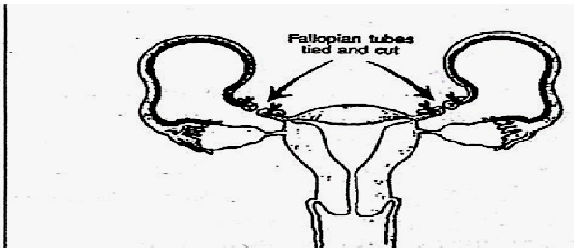
8. **Sterilization:** this is most reliable these days. There are two types of sterilization. These are:

   Vasectomy: this is a sterilization method of men. In this method vasadeferentia on each side is cut and cut ends are tied in a minor surgical operation under local anaesthesia. In such persons, semen and sex hormones are produced but they do not reach the urethra.

   Tubectomy: this is the sterilization method of women. Here the fallopian tubes are cut on either side or the cut ends are tied then. This prevents the ovum from entering the fallopian tube. This is also a simple operation and is performed under local anaesthesia.



Vasectomy



Tubectomy

Q.19. What do you mean by population explosion?

Ans: Population problem is a grave problem now a days. It can be defined as unprecedented growth of human.

Population at an alarming rate.

In the year 2000, the world population was 6.3 billion and is predicted to grow four times in the incoming 100 years. Our country India is the second largest country of the world in population after China. It is estimated that we are adding one Australia in our country every year. If we look at the population statistics of our country we find that in just 35 years after independence we added another India in terms of population. On 11th May, 2000 we became 1 billion and now we can say that every 6th person in this world is an Indian. As per the current census, population of India may be 1.4 billion by 2025.

Q.20. Describe the effects of population explosion.

Or

Describe various adverse effects (consequences) of rapid growth of population.

Ans. Population explosion is a grave problem throughout the world. It adversely affects our lives. Following are some ill effects of population explosion.

i) **Poverty:** A large family with a single earning hand often remains poor due to increasing cost of food, education, medicine and other household goods. Birth of every child adds to poverty.

ii) **Housing Shortage:** Rapid growth in population leads to housing problems. People move to cities and towns for suitable accommodation. This results in overcrowding. Most people cannot pay for suitable accommodation. Hence large part of our population lives on foot paths.

iii) **Pollutions:** Over population has created problems of pollution and environmental imbalances.

iv) **Unemployment:** Due to increase in population, our educated youths remain unemployed. Jobs are limited and employment cannot be given to such large number of educated youths.

v) **Lowering of education standard:** the population explosion has caused immense educational problems and difficulties. There is rush of students at every stage and this lowers the education standard. Moreover many students remain unattended. Large family is unable to afford higher education to its children.

vi) **Crimes:** Educated unemployed youth become victim of frustration and also indulge in anti social activities like terrorism, gambling, thieving, drug addiction etc.

vii) **Food problems:** increased population needs more food. Growth rate of food production is less than the growth rate of population in India. Therefore, rising population has caused food shortage.

viii) **Energy Crises:** increased population has created greater demand for energy, fuel wood, fossil fuels and electricity and this has led to energy crises.

ix) **Resource Depletion.** Increased population has created a huge pressure on some resources which are non – renewable. A day is not far when we would lose important resources and it will make the life problematic.

Q.21. Describe various causes of population explosion?

Or

Discuss the factors which contribute to high population growth in a developing country.

Ans. No doubt that population explosion is a grave problem of the word and our country also faces this problem badly. Following are some important causes of population in our country.

i. **Early Marriage:** It is a universal fact that who is born has to marry. But in India, we have early marriages and even child marriage. In this way fecundity period in females is increased and over population is resulted.

ii. **Control over death rate:** Due to advancement in medical science, many diseases like cholera, small pox, malaria have been controlled. Mostly the infant Mortality Rate (IMR) has almost halved in 50 years. Thus the death rate has lessened and it has contributed to over population.

iii. **Interest in large families:** In India 70 % population is living in rural areas. Thus population is engaged in agriculture. People in rural areas are interested in large families as agriculture needs more man power. Thus population explosion results.

iv. **Preference to sons:** In our country sons are supposed to carry the family name after the death of the father. Moreover sons are considered as earning hands. Some parents wait for a male child and they go on producing children. Therefore this factor has caused augment in over population.

v. **Illiteracy:** Most of Indian population is illiterate. They do not know anything about the effects of over population. Moreover they are also unaware about various devices of family planning. Thus they produce more children and they go on producing children and in this way over population results.

vi. **Religious Belief:** Some religions like Islam prohibit family planning. It is considered a sin to go for methods of birth control. Therefore Muslim community tend to increase the number which results in over population.

vii. **Remarriage of widows:** From the past few decades, widows in India are going for remarriage. This results in population increase.

Q.22. What is an ecosystem and what are its components?

Ans. As the term ecosystem indicates, "Eco" meaning environment and system implying an interacting interdependent complex. The term ecosystem was first of all proposed by A.G. tansely in1935 and defined it as an integrated system resulted from the interaction of living and non

– living components of the environment. Karl Mobius in 1877 used the term Biocoenosis. According to Odum and Clarke (1962) an ecosystem may be defined as a dynamic system which includes both biotic and abiotic components influencing the properties of each other and both are necessary for maintenance of life. In an ecosystem, there is an exchange of materials between living and non – living environment in a suitable cyclic manner. It may be as small as a pond and as big as forest. A balanced aquarium in the laboratory represents an ecosystem.

Ecosystem can be divided into two main types:

i. Natural Ecosystem:

These operate by themselves under natural conditions without any interference of man. On the basis of various kinds of habitat, natural ecosystem may be further decided into terrestrial type (e.g grassland, forest and desert) and aquatic including fresh (Water pond, river, stream etc) and marine (seas, estuary etc) ecosystems.

ii. Artificial Ecosystem:

These are man – made ecosystems being maintained by artificial means e.g aquarium. Garden, crop field etc. In them, natural balance is disturbed by addition of energy and planned manipulation.

iii. Components of ecosystem:

Odum in 1971 described that all ecosystems consists of two basic components from the structural point of view, which include abiotic components and biotic components.

Abiotic components: These components refer to non – living factors or elements present in the ecosystem. These include:

a) Inorganic Component: The inorganic components include carbon, oxygen, sulphur, hydrogen, nitrogen, CO_2, water etc.

b) Organic Components: Organic substances include carbohydrates, proteins, amino acids, lipids and highly organized molecules like DNA, RNA and ATP.

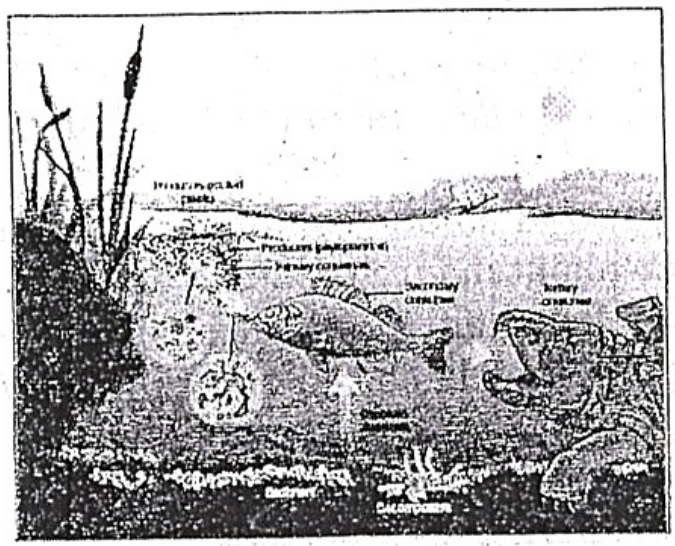
c) Climatic Components: These include light rain fall, humidity and temperature, wind etc.

d) Edaphic Factors: These include soil minerals, topography altitudes etc.

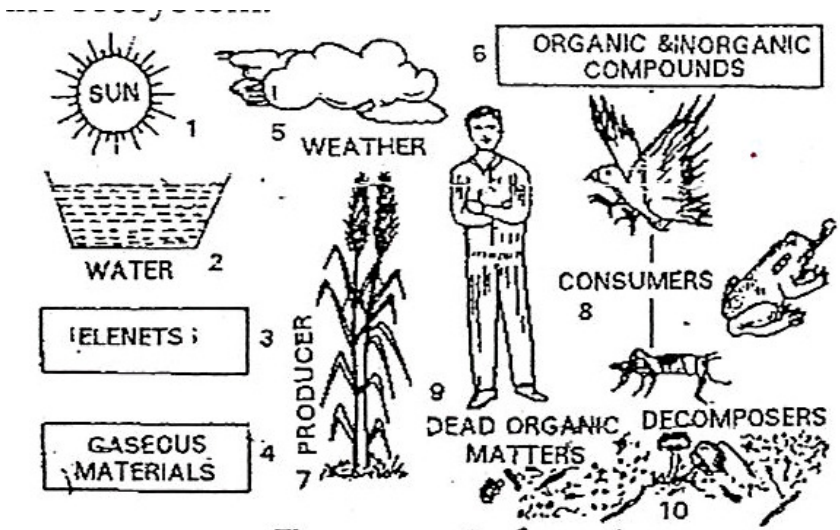
Biotic Components: These refer to the living elements of the ecosystem and include:-

a) Producer:- producers are autotrophic organisms like chemosynthetic and photosynthetic bacteria blue green algae and all other green plants and certain protozoan like euglena. These are only living beings capable of synthesizing food from non – living components by the process of photosynthesis. Hence these supply food to the whole world. These are also called as autotrophs.

b) Consumers: These are heterotrophic organisms mainly which eat other living creatures. These are also called heterotrophs. In a food chain, the consumer includes primary consumers or herbivore (plant eater – goat, deer, rabbit etc) directly eat up the plants, Secondary consumer or carnivore (Fox frog), tertiary consumer which eat up secondary consumer e.g wolf eating upon fox and quaternary consumer depending upon food chain which eat up on tertiary consumer e.g lion, tiger etc.



Structure of an aquatic ecosystem.



The components of ecosystem.

c) Decomposer:

Organisms like bacteria, actinomycetes, fungi

which depend upon the dead bodies of producers and consumers are called decomposers. These are also called as saprobes or reducers. These absorb decomposed products and release most of inorganic compounds like nitrates, phosphates, ammonia etc into the environment for reuse as a raw material for producers. Decomposers provide new space for new life in the biosphere; hence they are essential component of the ecosystem.

Q.23. Define Ecosystem. What is the human intervention on the natural ecosystem?

Ans. Ecosystem: Ecosystem may be defined as an integrated system resulted from the interaction of living and non – living components of the environment.

Man is wholly and solely dependent on nature for its survival. Nature has been very much kind to human being as it provides him everything that it needs. Each ecosystem at present is not in its natural setting due to various human interventions. Man has been degrading every natural ecosystem beyond repairs since ancient times. The various human interventions on the natural ecosystem are given below:

- **i.** Man has started over utilization of natural resources like forest, wildlife etc. This results in ecological imbalance.
- **ii.** The over expanding population leads to exhaustion of non – renewable resources.
- **iii.** By generating various pollutants both in terrestrial and aquatic ecosystem led to the imbalance in the natural ecosystem.
- **iv.** By destroying natural habitats like forests, grasslands for agriculture and habitation has resulted in loss of biodiversity which is more harmful for natural ecosystem.

Q.24. Describe various threats to the ecosystem?

Ans. The various threats to the ecosystem are as follows:

i. Expanding agriculture:

Agriculture refers to preparation of land for deliberately sowing or planting the crop plants. Due to increased human population, there is

need to produce more and more food. In order to get more food more and more land is brought under cultivation. Agriculture land has risen from 4.55 billion hectare (1996) to 4.93 billion hectares in 1999. Therefore the agriculture is expanding. Man has converted forests, grasslands, wetlands and other natural habitats into crop fields. This has destroyed the natural ecosystem on the surface of earth. Moreover for better yield, man uses excessive pesticides, manures and fertilizers which pose alarming threat to biodiversity. Some of the pesticides and fertilizers find their way into water bodies and kill aquatic life hence damage the aquatic ecosystem. Surveys conducted show that 40% agricultural land is seriously degraded resulting in change in biological processes. The nitrogen cycle has been disrupted due to excessive fertilizers, manures and human activity.

ii. Wastes from human societies:

Wastes from human societies pose a serious threat to the ecosystem. These wastes cause air, water and land pollution. The sewage that includes human excreta, wash waters of utensils, industrial wastes (oil, acids, salts, heavy metal etc) and the detergents enter our water bodies. Due to the accumulation of such wastes in the water bodies, the aquatic life gets damaged in the aquatic ecosystem this also results in eutrophication which is more harmful for aquatic ecosystem. Agriculture discharge and industrial effluents also enter into water bodies and damage the aquatic ecosystem. Some non degradable wastes like nylon, plastic, polythene, broken glasses etc interfere in soil fertility and hence degrade the ecosystem.

iii. Increasing human consumption:

Due to population explosion and due to change in life style, the modern man has begun to exploit the natural ecosystem. Trees are being cut down, medicinal plants are over collected and fossil fuels are exploited which have caused ecological imbalance. Wood for paper consumption has increased due to increased population growth

and paper consumption is likely to increase 1.5 to 5 kg. Biodiversity is losing at an alarming rate which in turn results in degradation of aquatic and terrestrial ecosystem. Due to increased consumption of natural resources more waste is generated which is a threat to any ecosystem.

iv. Habitat destruction:

The major threat, the biosphere facing is habitat destruction. Habitat is a natural place of an organism where it occurs. Due to expanding agriculture, urbanisation and industrialization the natural habitats like grasslands, forests, wet lands etc are destroyed resulting in the destruction of habitat of millions of species. Habitat destruction thus has an adverse impact on biodiversity as it leads to the loss of environment which provides organisms food and breeding grounds or nesting sites to facilitate rearing of their young ones. In India about 80% of natural habitats have been destroyed to meet the needs e.g if forests are cleared which provide habitat for number of species, the organisms living there will perish. Due to reduction in biodiversity, the ecological imbalance has occurred which is harmful for ecosystem. The root cause of habitat destruction is population explosion.

v. Genetic erosion:

The diversity in the genetic makeup of species is referred to as genetic diversity. The process of reduction of genetic diversity is known as genetic erosion. A number of plant and animals species have become extinct or facing extinction. Each extinct species takes away with it a combination of traits or gene pool which took millions of years to evolve.

Besides climate changes, man is responsible for genetic erosion for flora and fauna. Habitat destruction, introduction of exotic species, over harvesting and various pollutions through human activities play a crucial role in the loss of genetic diversity which is harmful to an ecosystem. Priority to high yielding varieties (HYV) in

agriculture, fisheries, live stock results in genetic erosion by ignoring primitive varieties. Loss of varieties or species results in ecological imbalance as organisms maintain the ecological balance in nature. In this way genetic erosion is affecting the natural ecosystems.

vi. Loss of Biodiversity:

Biodiversity or biological diversity can be defined as the sum total of various types of microbes, plants and animals present on the earth. Biodiversity is essential for any ecosystem as it maintains ecological balance and natural cycles. Unfortunately we are losing biodiversity at an alarming pace due to habitat destruction, poaching, pollutions, over exploitations, natural calamities. The loss of biodiversity in turn damages the ecosystem by creating ecological imbalance and disturbing the natural cycles.

vii. Impound Water:

Building a dam usually plays an important role in elimination of species especially this human activity is a threat to the endemic species of the area where the project is constructed. Due to impoundment of water, a large area comes under the water. Land forests vegetation and animal life gets buried under and get destroyed. Construction blocks the routes of migratory fishes like Salmon, trout etc. which requires migration for breeding purposes. Hence, this action of man damages the ecosystem.

Q.25. What is the role of biodiversity in ecosystem (environment)?

Ans. All ecosystems (aquatic and terrestrial) posses varied biodiversity which remains in the given ecosystem in harmony and in equilibrium with nature and hence maintain ecological balance. Biodiversity maintains natural cycle in any ecosystem. Biodiversity (lichens) are best indicator of SO_2 pollution. Absence of earthworm in soil indicates radioactive pollution. Similarly presence of chara, volfia indicates water pollution. Plants (forests) make climate humid. The flora prevents soil erosion from a link in water cycle and fauna like

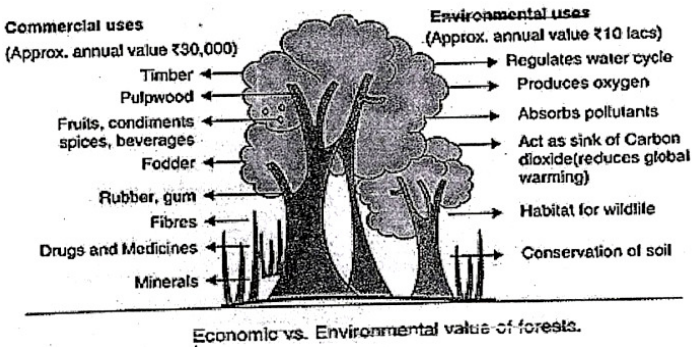
honey bee, wasp helps in pollination. Hence if, biodiversity is lost, ecosystem will not function at all as the biotic component is essential for any ecosystem. Hence biodiversity manages the ecosystem. Loss of biodiversity creates ecological imbalance by destroying the natural cycles and also destroying the food chains which is harmful for the ecosystem.

Q.26. What is a forest? Give the uses of forests?

Ans. Forests are the large area of land mainly covered by trees, shrubs, bushes and climbers closely together. According to FAQ, a forest is a land with tree crown cover of more that 10% and area of more than 0.5 hectare. The science of development and management of forest is called as forestry and an officer who is in charge of forest is called as forester. In India forests occupy $1/10^{th}$ of the land area.

Uses of forests: Forests are essential of all natural resources and have unlimited roles some of them are:

1. Forests provide a number of useful products such as timber, firewood, fruits, seeds, rubber, paper, gum, species, fiber, fodder, beverages, minerals, oils, medicine, bidi leaf, bamboo.
2. They purify air by adding O2 to the atmosphere and by removing CO2 from it.
3. Forests prevent soil erosion by holding the soil particles tightly together by its roots.
4. They form an important link in water cycle and maintain water level, rainfall and humidity of an area.
5. Forests provide suitable habitat for wild life.
6. Trees along with vegetation growing under shade helps in percolation of ground water. Hence maintain ground water level.
7. Tribals living in forests use forest as a source of steady income by obtaining minor forest products like seeds fruits, mushroom, medicine,



Economic vs. Environmental value of forests.

leaves (for making umbrellas and hand fans) etc.

8. Forests add to the beauty of nature.
9. Forest (forest department) provide job opportunities to educated youth as forester, forest guard, DFO etc.

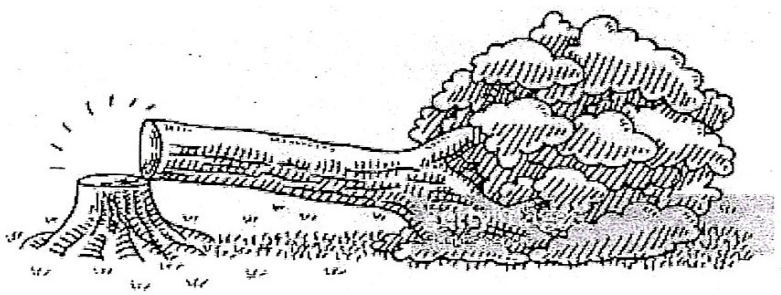
Q.27. What is deforestation and what are the various consequences (effects) of deforestation?

Ans. Deforestation simply means destruction of forests or cutting down of trees. The food and agricultural Organisation (FAO) of the United Nations defined deforestation as "deforestation is the conversion of forest to other uses such as cropland and shifting cultivation. As per this definition, between 1980 – 1998, global forest cover diminished around 2.5%. Deforestation is done throughout the world. India is losing forest cover at a rate of 1.5 million hectares per year. Man is the only agent of large – scale deforestation. Expanding agriculture population increase, timber harvesting etc. are main causes of deforestation. Due to deforestation severe environmental problems are caused like air pollution, soil erosion, ecological imbalance etc.

Effects of deforestation: Various consequences of deforestation are given below.

1. Trees are necessary for good land and soil. By destroying forests, man has changed many areas of land which were once fertile into barren areas; unfit for cultivation and finally into deserts.
2. Deforestation results in the extinction of wild life as the forests provide suitable habitats for wild life. Extinction of wild life results in ecological imbalance.
3. Due to deforestation there will be high concentration of CO2 in the atmosphere which results in green house effect.
4. Deforestation leads to shortage of oxygen in the atmosphere as trees breath out oxygen. Shortage of O2 results in destruction of animal life.
5. Deforestation leads to soil erosion

6. Deforestation results in desertification.
7. Due to deforestation, there will be no rain hence there is no ground water and also scarcity of water will take place on the planet earth.



Q.28. Write a note on critical state of Indian Forests?

Ans. According to recent estimates, India forests accounting for about 20.55% of the total geographic area of the country. At present the Indian forests are in critical state because Indian people are putting heavy pressure upon the forests to obtain these useful products. Moreover, the processes like mining, road building, construction of dams, urbanisation have lead to shrinkage of forest cover. This is mainly due to population explosion and also due to our ignorance and unawareness. Our country India is poorest country in terms of forest land as forest land in India is 0.01 hectare per person as compared to the world average of one hectare. Indian forests comprises only 0.05% of the world forest area. In 1951, forest cover in India was 73.5 million hectare which reduced to 69 million hectare in 1960 – 61. India is losing forest land at the rate of 1.5 million hectare per year and if this continue India may reach the Zero forest value within the next two years. This leads to critical state of Indian forests. This critical state occurs due to following factors like shifting cultivation, road construction, overgrazing, population pressure, timber harvesting, fuel wood collection, expanding agriculture, dam construction etc.

Q.29. What are the various causes of deforestation?

Ans. The various causes of deforestation are as:

i. **Expanding Agriculture:** expanding agriculture is one of the most important causes of deforestation. As demands on agriculture

products rise, more and more land is brought under cultivation for which forests are cleared. It has been estimated during past 30 years 25 million hectares of forests have been brought under cultivation for fulfilling the food demands of increasing human population.

ii. **Shifting Cultivation:** Shifting cultivation or Jhum cultivation is a kind of agricultural practice, normally done in hilly areas by tribal families. Where a piece of land is cleared of the forest for the cultivation, after harvesting the land is left fallow (not put into use) and the cultivators move on to a fresh patch of land. We lose 5 lakh hectare of forest cover annually due to shifting cultivation. In India shifting cultivation is done in Bihar, MP, AP etc.

iii. **Crash Crops:** Cash crops are those crops which are raise foe getting money. A large area of tropical forests have been cleared for raising cash crops like banana, pine apples, cotton, saffron, tea, coffee etc. Bung, cocaine are also grown and then smuggled into more developed countries to earn a lot of wealth. Cash crop cultivation results in soil erosion and loss of soil fertility.

iv. **Grazing:** Grazing is one of the causes of deforestation. India has live stock (cattle) population more than her requirements. Consequently there has been a great pressure of grazing by the cattle in the forest areas of the country. Grazing makes the soil compact hence soil looses water holding capacity.

v. **Timber harvesting:** Live trees with thick and straight trunks are felled and transported to commercial establishments elsewhere to consumers who are ready to pay. In this process large stretches of forests are damaged.

vi. **Fuel wood:** majority of Indian rural people uses wood for cooking their food and warming up houses during winter. Wood is preferred as fuel because of less cost and less problem in transportation. In order to collect fuel wood, trees are being cut from the forest. Due

to poverty, people enter into the occupation of selling fuel wood. For getting fuel wood forests are cleared.

vii. Forest Fire: It is also called wild fire and is defined as any unexpected or unregulated combustion of vegetation spreading over a large forest area. It can occur either naturally (lightning, volcanic eruption and ignition temperature) or by careless attitude of visitors, wood cutters, soldiers etc. Once the forest catches fire, it spreads far destroying trees, vegetation and new saplings.

viii. Mining, road construction, dam construction in forest areas also results in destruction of forests.

Q.30. How can we conserve forests?

Ans. Forests can be conserved by the following ways:

i. Deforestation should be avoided.
ii. Afforestation should be done
iii. Forest fire should be stopped.
iv. Grazing should be banned
v. Controlling unregulated fuel wood and timber harvesting.
vi. Social forestry and agro forestry should be practiced.
vii. By educating common people about the importance of forests.
viii. Deforestation for the purpose of agriculture should be banned.
ix. Construction of roads, factories, industries, power plants in the forests should be banned.
x. Forest laws should be adopted and enforced.

Q.31. Write a note on tribals and their right in the forest area?

Ans. Tribals living in forest get everything for their survival from the forests as they have many traditional rights over forests and inturn

do best for conserving forests. But now –a–day tribals have become the victims of circumstances and turned agents of large scale deforestation. Many people have encroached upon the tribal land in the forest, hence resulted in large scale deforestation by the tribals. Hence any activity that is affecting the tribals will affect the forest environment. It becomes necessary that tribals should involve in the forest protection programmes. The National Forest Policy (NFP) states that a symbiotic relationship of the tribes and the forests should be recognised and used in forest protection, regeneration and provide suitable jobs to people living in an around the forests.

Tribal participation is must in conservation of natural resources. Supreme Court acknowledged tribals in the forest use minor forest products like fodder, timber, fruits, leaves etc. Several cases were filed against tribals. The court urged active participation of tribals in the conservation of forests along with forest department. They have got their rights and are conservators of forests. The courts declared they don't have the right to access to all the forest produce and certain regulation will be imposed for their acquisition of the forest products.

Q.32. How is poaching a threat to biodiversity?

Ans. Poaching is a threat to biodiversity especially Fauna. Poaching simply means catching or killing of animals without permission from the government. In other words, poaching can be defined as illegal hunting or fishing of animals. The poaching is illegal because the animal or fish is protected by law and the animal is on restricted area.

Poaching cause extinction of number of species especially those having valuable body parts like fur, skin, horns, ivory, bones etc. Poaching is also done to get the body parts which have medicinal uses e.g horns of rhinoceros, bones of tiger etc. Due to poaching zoo tigers were killed in order to get their skin and bones.

Capturing of live animals for pet trade and for use as performing animals is also a kind of poaching. Sometimes adult animals are deliberately killed and their young ones are then captured and then made them pet. Birds (parrot), reptiles, primates are common targets of pet trade. Animals like monkeys apes, bears, elephants, snakes etc are taken as performing animals. From the above discussion it is clear that poaching is a bane to wild life.

Q.33. How is tourism a threat to biodiversity?

Ans. World tourist organisation (WTO) defined tourist as the people who are travelling to and staying in places outside their usual environment for either leisure or business purposes. Tourism is world's largest industry and is growing in Asia including our country India by leaps and bounds. Tourism industry is advantageous as it increase the economy of a country. Tourism provides a wide range of employment opportunities to the educated young people. But at the same time tourism is harmful to the environment. We know that tourism has direct relation with the environment of a place. Due to the bulk of tourists, more land is converted to resort places and new roads. The construction of hotels, tea stalls, roads etc. leads to destruction of natural environment. The construction disturbs the living of organisms and also damages the habitats of organisms where the hotels are being erected. Moreover tourism results in increase in pollution and more waste generation which are harmful for natural environment. Photos taken by tourists and animal watching disturbs the feeding and breeding of wild animals which is responsible for relocating of wild animals and finally results in their extinction.

Q.34. How are dams and road construction, a threat to biodiversity?

Ans. Threat of road construction: No doubt that road construction is beneficial. But on the other hand it has number of disadvantages. Usually factories are constructed on hilly areas. This needs a road construction also. For road construction in hilly areas, blasting

operation can cause a huge damage to the environment through loosening the hill sides and resulting in landslides. The land where the road is constructed is rich in living organisms including microorganism will perish. Moreover, the life of wild animals gets distributed due to road construction in the forests and in this way they become extinct.

Threat of development projects (Dams): Dam is a barrier or wall that impounds water. Dams are built across a river that stops its flow and collects the water e.g tehri dam, Bakhra dam, Tawa dam etc. Like road construction, building a dam also plays an important role in elimination of number of species especially this human activity is a threat to the biodiversity of the area where the project is constructed. Due to construction of dams a large area comes under the water, land forest, vegetation and animal life gets buried under water and as a result they are destroyed. Construction of dam blocks the routes of migratory fishes like salmon, trout etc which require migration for breeding purpose. The construction of dam also results in migration of people.

Q.35. What are the advantages and disadvantages of dam?

Or

Are the development projects boon or a bane? Discuss.

Ans. Dams are both boon as well as bane. As for as boon aspect is concerned, dams have following advantages.

- **i.** Dams contain plenty of water which is used for irrigation throughout the year (especially during shortage of water) hence there is better crop yield.
- **ii.** Dams provide drinking water supply to villages, towns and cities through pipelines.
- **iii.** Dams prevent floods.
- **iv.** Dams are used for generating hydropower.
- **v.** Factories use water of dams for cooling and for making products.

vi. It is used for swimming, boating, fishing etc.

vii. Dams invite visitors as dams have recreational and aesthetic value.

As for as bane aspect of dam is concerned, it has following disadvantages.

i. Due to dam construction, many people have to migrate hence become homeless. They do not get adequate compensation and rehabilitation.

ii. Project engulfs a huge amount of public money without yielding proportional benefits.

iii. Forests, vegetation, wildlife gets buried under water and as a result get destroyed hence loss of biodiversity occurs which is more harmful as ecological imbalance occurs.

iv. Water gets evaporated from dams.

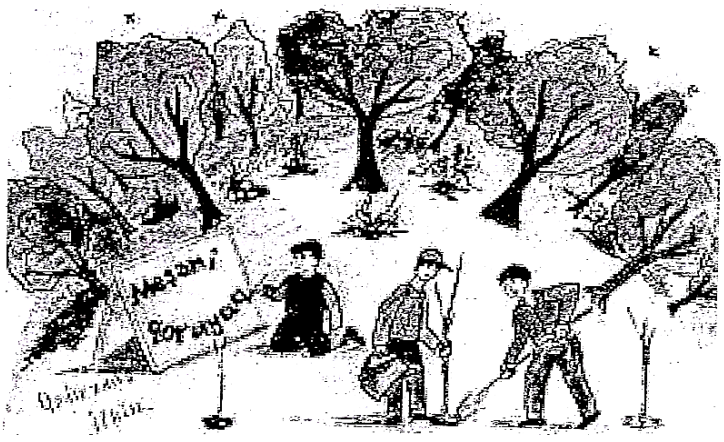
v. It blocks the routes of migratory fishes (salmon) which require migration for breeding.

vi. Collapsing of dam causes great damage.

vii. Leakage in dam results in loss of water.

Q.36. What is social forestry and what are its benefits?

Ans. The social forestry is also known as "Community Forestry" and was first used by the National Commission in Agriculture, Govt. of India started in 1976. The social forestry can be defined as the plantation of trees on village common lands and waste lands and along roadsides, railway sides, banks of water bodies and other vacant lands by cooperative efforts of villagers of the areas. The social forestry is done by the common people for their own benefit. Hence social forestry can also be



defined as a "forestry for the people by the people and of the people".

The main objectives of social forestry which are:

- **i.** Use of common and public land to provide firewood, fodder and small timber to the local people and also to manage soil and water conservation.
- **ii.** To relieve the pressure on forest.
- **iii.** To increase natural beauty of the landscape.
- **iv.** To improve environment.

Benefits of Social Forestry:

- **i.** Social forestry helps in minimizing pressure on natural forests.
- **ii.** The common and waste lands are used up.
- **iii.** The common people get firewood, fodder and timber with ease.
- **iv.** Wastes (Dung) obtained from domestic animals and wastes from plants is used as manure in fields.
- **v.** Common people become independent in getting products like timber, fire wood, meat, milk etc.

Q.37. Write a note on forest conservation Act 1980?

Ans. The government of India enacted the forest conservation Act on 25th Dec. 1980 to conserve all types of forests. The main purpose of the act was to check indiscriminate deforestation, preservation and diversion of forest land to non – forest purpose. Under this Act, prior approval of central government is required before any reserved forest is decided to non – forest purpose. If diversion is permitted, compensatory afforestation must be undertaken on an equivalent area of non – forest or double the area of degraded forest. Six regional offices have been opened to monitor the status of forests and steps have been taken for their conservation in Chandigarh, Lucknow, Bhopal, Bangalore and Bhubaneshwar. Under this Act, a control should be exerted over Jhum cultivation, encroachment and cattle grazing. Moreover there should be a control of movement of forest produce. Cash crops like tea, coffee, saffron etc are not

permitted in the reserved forests under the Act. Through this act forests are conserved and hence ecological balance is maintained in nature.

Q.38. What is the role of forest department in conserving the forests?

Ans. Forest department plays a significant role in conserving forests. Forest department recruits DFO, ranger, forest guards, forester etc which look after and care the forests. Forest protection force which is under forest department can control felling of forest trees, smuggling of medicinal herbs poaching of animals etc. this force also checks the saw mills for forest wood. The forest department also prevent encroachment on forest land by civilians. They can regulate harvest of forest timber by cutting old and dead trees and making them available at depots for civilians use. Hence smuggling of forest timber is checked. They make the exsitu and insitu conservation of forest plants. The forest department has been entrusted with job of raising fuel and fodder plantation and growing bamboo and medicinal plants on forest degraded land and waste land. They take part actively in conservation of forest by adopting various conservational methods.

Q.39. Describe the role of non – governmental organisations (NGOs) in the conservation of environment?

Ans. NGOs play a significant role in the development of environmental policy. NGOs usually consist of volunteers or group of persons genuinely interested in the cause of conservation of wild life, natural resources (water, forest soil etc) and protection of the environment. NGOs play an important role in sustainable forest development. They act as a role of middle man between government and other interest holders in forest conservation. They organize forest awareness programmes at various levels. They play a role in promotion of social forestry. Village reconstruction Organisation –

an NGO (AP) has planted more than 1.5 million trees in Orissa, AP and Tamil Nadu. They also provide training in nursery raising and tree planting. Anand Niketan Ashram (Baroda) did a good service for tribals to improve the quality of life through aforestation. Similarly Rama Krishna Mission Ashram (Bihar) encourages tree plantation by women.

Q.40. Discuss the concept of Joint Forest Management (JFM)?

Ans. Human communities living in an around forest tend to care forest resource as they get livelihood from them. After independence, Govt. Started managing the forests themselves and hence it became difficult for communities to use forest, this resulted in large scale deforestation and unsustainable forest management. By realising this government of India introduced the Joint Forest Management (JFM) resolution in June 1990. Hence JFM is the involvement of local in managing forests with government. JFM is the managing of forest resources jointly by the forest department and the local communities, In JFM, both user (local people) and owner (government) are equally benefitted. Under JFM forest protection communities are formed between villagers and forest officials which safeguard and protect the forests. The main role of JFM is to protect the forests and to maintain the already existing but fast depleting forest and water resources. Moreover, JFM also encourage the plantation of trees on degrade forest lands. The JFM programme also helps in creating a sense of sustainable development of forest resources. JFM has great significance for resource development and poverty reduction. As of march 2006 22 million hectares of forest land in 28 states are managing under JFM by 1,06,482 communities.

Q.41. What is scientific forestry and what are its limitations?

Ans. Forests are rich in fresh seedling, mature thick trees, old and rotting trees with fascinating fungi. The forest is also rich in wild animals. Many states have established a separate corporation to look into and

ensure scientific management of forests on commercial lines. These corporations are engaged in trading of timber and other products and taking up the task of forest plantation. Scientific forestry stresses upon mono culture practice where only one kind of plant species is grown for commercial purpose.

Limitations of scientific forestry:

Scientific forestry has following limitations:

a. Cutting of old trees can no doubt yield a financial support but on the other hand has many ill effects like soil erosion, destruction of habitats of wild life, nutrient loss, extinction of species etc.

b. Scientific forestry emphasizes wood production and neglects public affairs like soil conservation, hunter gatherer food scenic quality, natural conservation.

c. If communities are to invest money in long term forestry they have every right to be involved in decision making process.

d. Plantation forestry is difficult as it takes more than one human life time for trees to become mature.

Q.42. Define wild life? What is its importance?

Ans. The term 'wild' relates to the 'nature' and 'life' relates to 'living organisms'. The term wild life was first introduced in 1913 by W. Hornaday. The wild life is often restricted to wild animals. But wild life can be defined in its real and best sprit as "all living organisms whether plants or animals lower or higher which occur naturally and are neither cultivated nor domesticated. In simple words undomesticated animals and uncultivated plants constitute wild life.

Importance of wild life or wild life conservation is necessary:

Wild life has an immense importance like:

a. It maintains food chain, and natural cycles and balances populations **(Ecological Balance)**

b. Wild life maintains ecological balance which is essential for survival of all living creatures including man **(Survival Value).**

c. Wild life acts as a gene banks for breeding programmes in agriculture, animal husbandry and fishery.

d. Wild plants provide useful products like gum, resin, timber, paper, dry fruits, rubber, oil, medicine etc. and wild animals provide ivory, fur , honey, medicine, leather etc. **(Economic Value)**

e. Wild animals have scientific value, used for medical research like fruit fly, rat, rabbit, monkey etc. **(Scientific Value)**

f. Wild life especially wild animals like tiger, bear, monkey, parrot etc in circus show, zoos, national parks and in wilderness provides enjoyment and immense pleasure to people. **(Recreational Value)**

g. The green forests, beautiful flowers, singing birds and colourful butterflies add the beauty of nature. **(Aesthetic Value)**

Q.43. What are the various causes of extinction of wild life?

Ans. Following are the various causes of extinction of wild life

a. Habitat Destruction: habitat destruction is the main cause of extinction of species and this has occurred mainly due to human activities. Population explosion and development requires more industries, more agriculture, new roads, canals, dams etc. due to population explosion, there is cutting down of trees, filling of wet lands, ploughing of grasslands. All these activities, renders the plants, animals and microorganisms homeless and ultimately get extinct.

b. **Habitat Fragmentation:** Fragmentation means breaking a large natural habitat into smaller patches by human settlements, agricultural crop yields, orchards, building of roads, digging of canals etc. this results in the shrinking of habitat of species and they disappear. Fragmentation reduces the core area and increases the edge area. Species living in core or deeper area disappear first.

c. **Over Exploitation:** Over exploitation is a serious threat to the biodiversity. Exploitation of biodiversity beyond the degree of their renewability results extinction. Excessive deforestation, over grazing, over culture, excessive use of medicinal plants, hunting of animals result in extinction of species e.g. fish, molluscs, whales. Indian cheetah etc.

d. **Introduction of Exotic species:** new species of plants and animals entering a geographical region is called exotic species. Introduction of exotic species deliberately or inadvertently has resulted in loss of biodiversity. E.g, wolf snail reached Polynesia Island started feeding on native snails. Similarly exotic trout and brass are endangering many species in India. American cockroach introduced into India through food ships is replacing the native Indian cockroach.

e. **Lack of education (illiteracy):** illiteracy is another reason for the extinction of biodiversity. Since many people are unaware about the importance of biodiversity, they unknowingly destroy, kill or uncare for the biodiversity.

f. **Increased International Trade:** Various parts of plants and animals are vulnerable. So trade of these products is being done with nations. These products include fur, hide, meat, horns, fish and plants products for pharmaceuticals, perfumes, cosmetics etc to get these products, loss of species takes place.

g. **Medicinal value of some species:** The animal and plant species have become extinct because some of their body parts are of great

medicinal value e.g. horns of deer, bark of Cinchons, nones of tiger etc.

Q.44. What are the various causes of extinction of wild life?

Ans. Following are the various causes of extinction of wildlife:

a. **Medicinal value of some species:** the animal and plant species have become extinct because some of their body parts are of great medicinal value e.g, horns of deer, bark of cinchona, bones of tiger etc.

b. **Destruction of natural habitat:** Due to the expanding agriculture, urbanization and industrialization, the natural habitats of wild species were destroyed which resulted in extinction of wild life.

c. **Introduction of exotic species:** Introduction of exotic species can adversely affect by eating other species, infecting them or competing with them. e.g, rabbit and goat introduced in the islands of Pacific and Indian oceans are destroying the habitats of many native plants, reptiles and birds. Similarly introduction of American cockroach in India destroy the India cockroach.

d. **Increased International Trade:** increased trade of rare commodities of wild origin like hide, skin, fur, horn etc, and plant products for pharmaceuticals perfumes, cosmetics, decoration etc are reasons for destruction of wild species.

e. **Over exploitation:** it is a serious threat to wild life that many species of fish and molluscs, sea turtles, whales are facing totally extinction due to exploitation.

f. **Lack of education:** People in our country are not aware of the importance of wild life of the possible consequences of the destruction of wild life and of the methods to protect.

g. **Forest fire:** it is held that forest fires resulting from human activity or mistake have caused elimination of many species of wild life.

h. **Official Laxity:** laxity on the part of the officials in the enforcement of the wild life protect act is also one of the reason for extinction of wild life.

Q.45. What is conservation and what is its importance?

Ans. **Conservation:** Most conservationists interpret conservation as the total protection and are against any form for consumptive use. The world conservation strategy (WCS) has defined conservation as the management of human use of the biosphere so that it may yield the greater benefits to the present generation, while maintaining its potential to meet the needs and aspiration for the future generation. Thus conservation is taking from nature as much as you can return. The chief aims for conservation are: to ensure a continuous yield of biotic as well as abiotic resources by establishing a balance cycle of harvest and renewal.

Importance of conservation:-

Conservation is one of the most significant application of ecology. It avoids unplanned development which breaks ecological as well as human laws. Conservation maintains the ecological balance in the environment. Conservation also seeks to prevent complete loss of species. Moreover, conservation plays an important role in conserving natural resources for future generation by proper utilization of resources. Due to conservation biosphere will last for long.

Q.46. What is wild life conservation and what are its types?

Ans. The World Conservation Strategy (WCS) has defined conservation as "management of human use of the biosphere as that it may yield

greater sustainable benefits to the present generation while maintaining its potential to meet the needs and aspiration of future generation". In other words conservation simply means take from nature as much as you can return to it.

There are two categories of conservation:

Insitu (on site) conservation:

This is the conservation of wild life in their natural habitat. This type of conservation includes national parks, sanctuaries, natural reserves, biosphere reserves etc.

Exsitu (off site) conservation:

This type of conservation is outside their habitats by perpetuating sample populations in genetic resources centre. This type of conservation includes zoos, botanical gardens, culture collections, gene pools, gametic storage of fish, banks for seeds, pollen, semen, eggs etc.

Q.47. What is a National Park? Write some important national parks in India?

Ans. National Park: a national park is an area reserved and maintained by national government for the betterment of wild life and activities like grazing, cultivation and collection of minor forest products are not allowed and no private ownership right is allowed. In India, there are more than 92 national parks at present. Some of the national parks of India are as follows.

Corbett National park: This is the India's first national park set up in 1936 located in Uttaranchal. The project tiger was launched here for the first time to protect the endangered Indian tiger. The park also serves as natural habitat for 50 mammals 580 species of birds and 25 reptiles.

a. **Dachigam National Park:** This national park is located in Srinagar city of J&K just 20Km away from the capital city of

Srinagar and notified in 1981. This park is natural habitat foe Kashmiri stag (hangul) besides containing variety of vegetation type.

b. **Kaziranga National Park:** it is located in Assam on the bank of river Brahmaputra and notifies in 1974. It is rich in one horned Rhinoceros, Swamp deer, bison, tiger, leopard, python etc are also found here.

c. **Dudwah National Park:** it is located in U.P 24 km away from the capital city Lucknow (1977). Crocodile, python, leopard, rhinoceros etc are found here.

d. **Ranthambore National Park:** it is located in Rajasthan (1980) and is a natural habitat for 40 tigers and also contains crocodile, nilgai, Gazelle, sambhar etc.

e. **Kanha National Park:** It is located in MP (1955). The Swamp deer (Barasingha) is the jewel of this National Park. It also contains Leopard, Langur, Mangoose, cat, hyena etc.

f. **Bandhave National Park:** It is located in M.P and notified in 1968. White tiger is the principal animal of this park.

g. **Git National Park:** It is located in Gujrat (1965). In this park Gir Lion is found.

Scene of a National Park.
(Gate of Kanha National Park)

Q.48. What is a Sanctuary? Write some important wild life sanctuaries of India?

Ans. Sanctuary: A sanctuary is a reserved area, where animals are protected and operations like cultivation, grazing and collection of minor forest products is allowed so long they do not affect the animals and private ownership writs are permitted. In India, there

are more than 500 sanctuaries at present. Some of the sanctuaries are as follows:

a. **Manas Wild Life Sanctuary:** This sanctuary is located in Assam. It is famous for golden langur. It also harbours, wild buffaloes, fishing eagles, wild dog etc.

b. **Overa Wild Life Sanctuary:** it is located in J&K (Pahalgam). It contains 30 species of mammals including black beer, brown beer, leopard, musk deer and 100 species of birds.

c. **Baratpur Wild Life Sanctuary:** it is located in Rajasthan. It harbours all types of indigenous, nesting water birds and migrant birds. It is also a beautiful home of fishes.

d. **Anamali Sanctuary:** it is located in Tamil Nadu. Fauna includes elephant, gaur, cheetah, barking deer, lion, tailed macaque etc.

e. **Sarika Sanctuary:** It is located in Rajasthan. Fauna includes tiger, leopard, spotted deer, jungle cat, pea fowl four horned antelope etc.

f. **Ram Nagar Sanctuary:** It is situated in the close proximity of Jammu city. It is rich in Nilgiri Barking deer, wild deer, monkey etc.

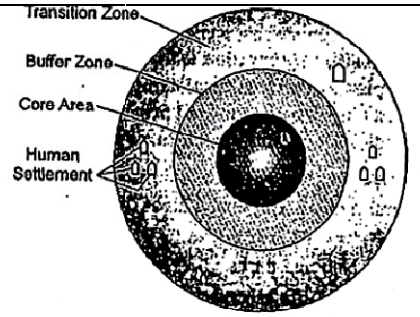
g. **Periyar Wild Life Sanctuary:** it is located in Kerela. Fauna includes wild elephants, gaurs, leopards, Nilgiri langur, wild dogs, barking deer and birds like grey horn bills, egrets etc.

h. **Sultanpur Bird Sanctuary:** It is located in Haryana about 30 kms away Delhi. It's typical avifauna includes, crane, sarus, spot – bill, drake etc.

i. **Shikaridevi Wild Life Sanctuary:** It is located in Mandi district of Himachal Pradesh. Fauna of this sanctuary includes snow leopard, flying fox, black beer, barking deer, partridge etc.

j. **Mudumali Wild Life Sanctuary:** It is located in Tamil Nadu. Bird life is rich and attractive in this sanctuary. Besides birds,

animals include wild elephant, gaur, flying squirrel, flying lizard, jackal, wild cat etc.



The zonation in a terrestrial biosphere reserve

Q.49. Write an account on Biosphere reserves?

Ans. The concept of biosphere reserve was launched by UNESCO in 1971 under its Man and Biosphere Programme (MAB). Biosphere reserves is a large protected area of land meant for conservation of wild life and the traditional life style of tribal people of the area of land meant for conservation of wild life is divided into zones and a particular activity is allowed in a particular zone in our country fourteen areas have been identifies as biosphere reserves.

Objectives of biosphere reserve:

- **a.** Provide areas for ecological and environmental research.
- **b.** Provide facility for education and training.
- **c.** To conserve wild life (or biodiversity)

Structures of biosphere reserve:

In biosphere reserve there are three zones. First one is the core zone (natural zone) which is the centre of the biosphere. This zone will be strictly protected from the human interference. The next one is the buffer zone – I which is immediately adjacent to the core zone. Here little human activity is allowed like education and research. The third one is the manipulation zone or buffer zone – II or transition zone and this zone will be open for general public for recreation, cropping, forestry, settlement and other economic uses and in continuation harmony with conservation goal proper supervision.

The core advisory committee of India identified 14 point sites of setting up the biosphere reserve.

1.	Niligri Biosphere Reserve	Tamil Nadu, Kerela, Karnataka
2.	Namdapa Biosphere Reserve	Andra Pradesh
3.	Nandadevi Biosphere Reserve	Utter Pradesh
4.	Utrakhand Biosphere Reserve	Utter Pradesh

5.	Andamans	Andaman and Nicobar Islands
6.	Gulf of Manar	Tamil Nadu
7.	Kaziranga	Assam
8.	Sunderbans	West Bengal
9.	Thar Desert	Rajasthan
10.	Manas	Assam
11.	Kanha	Madhya Pradesh
12.	Nokrek	Meghalaya
13.	Little Rann of Kutch	Gujarat
14.	Great Nicobar Islands	Andaman and Nicobar

Q.50. Describe classification of scarce wild life.

Ans. There are four major classes of wild life that are facing extinction which include:

a. **Endangered species (E):** the species or texa which are in danger of extinction and whose survival is unlikely of the affecting factors continue to be operating. These require direct human protection for survival e.g Nilgiri Langur, Kashmir Stag , tiger, lion , blue whale etc.

b. **Vulnerable Species (V):** the species or texa likely to move into the endangered category in the near future, if the causal factors continue to operate e.g spotted deer, golden langur, black buck, Asiatic elephant etc.

c. **Rare Species(R):** these are species with small population in the world. These are not endangered and vulnerable but are at risk. These species have restricted geographical habitats and are thinly scattered e.g birds like Satyr Tragopan and Temminick Tragopan, whooping crane, Ganges shark etc.

d. **Threatened Species (T):** The term threatened is used in the context for conservation of species which are in any one of the above categories viz endangered, vulnerable or rare.

Q.51. State Wild Life Protection Act, 1972?

Ans. Wild Life Protection Act was enacted on 9th sept. 1972 for providing legal protection to wild life in general and to endangered fauna of the country particular. It has a provision for setting up of national parks, sanctuaries, biosphere reserves and zoos for protection of wild life. The act also stresses on the regulation of trade on wild animals and their products. Issuing of license on international trade on wild animals also comes in this act. Any person misuses the license should be punished for three years of jail and fine of rupees 25000. Under this Act, there is restriction and prohibition on poaching. Under this Act, captive breeding programmes of endangered species have been started. Various conservation projects like tiger project, lion project, crocodile breeding project, elephant project etc have been started for particular species.

Q.52. Write a note on CITES?

Ans. India is a signatory to the convention on International trade in Endangered Species (CITES)(1975) which has restricted the export and import of products of wild animals and has prohibited their exploitation. The convention has introduced an international system of licensing and legal procurements of certificates to control the trade of living specimens and products derived from listed species. The signatory countries as India agreed upon.

- **i.** That wild flora and fauna in their habitat are irreplaceable.
- **ii.** That the countries are aware about importance of wild life.
- **iii.** Cites is concerned with International cooperation to control only illegal trade in endangered species.

Q.53. Write a note on Indian Board of wild life (IBWL)?

Ans. The IBWL is the main advisory body of government of India and was first constituted in 1952. The functions of IBWL are as follows:

a. To advise the state and central government for promotion, conservation and effective control of poaching of wild life.
b. Setting up of National Parks, Sanctuaries and Zoos.
c. Wild life education among people.
d. To advice the government on policy regarding export of living animals skin, horns, feather, fur and other products of wild life.

Q.54. Describe World Wild fund for nature (WWF)?

Ans. WWF was established in 1961 at Garland Switzerland. It is the sister organization of IUCN. The symbol of this organisation is white and black coloured great "Panda". WWF in India was founded with a board of eight trustees and has its head quarters in Mumbai. WWF was a milestone in the path of progressed from a basically fund raising organisation for protection of individual species like "Arabian Oryx". In India it has supported the well – known "Project tiger". WWF plays a vital role in preserving genetic resources of species. The main function of WWF is to raise finds for the conservation of animals, publicize the conservation and to make public aware of its uses. In India the organisation helped to establish a snake park in Madras.

Q.55. Describe Tiger project?

Ans. The tiger is the national animal of India. Now it has become the endangered one. As a result of deforestation a number of animals died which were the prey of tigers and tigers do not get enough prey to survive. This results in the entrance of tigers into villages. Villagers kill them to protect themselves. Moreover, 200 tigers were killed recently by the people for commercial purpose in order to sell and export tiger skin, bones and claws [poaching]. Animals [tiger] also die due to inadequate veterinary care. More than 13

tigers died in Nandankanan zoo is Orissa. People from other countries visited India to kill tigers. Later it was banned.

India had about 60% of world's tiger population upto 1970. The tiger was listed endangered and in 1973 tiger project has been launched. Main objectives of project tiger are:

a. To ensure maintenance of available population of tigers in India.

b. To stop poaching

c. To maintain forests.

d. To preserve areas for biological significance.

There were 40000 royal Bengal tigers in 1909 – 1910. This number was reduced to 2500 by the year 1968. In 1972, the number of tiger was just 827. In 1972 as a result of recommendation of task force of the IBWL this project was initiated as a centre sector scheme on the 1st April 1973, with nine tiger reserves located in different kinds of habitats in nine states. Two more reserves were added till 1982, four more were added in 1987, one more Dudwah reserve in U.P was brought under the project with Dudwah National Park and add the number of tiger reserves to 16 in 12 states. In 1988, 17th tiger reserve was established in Tamil Nadu. At present there are 47 tiger reserves and the number of tigers rose upto 2622.The budgetary provision of the government during 1973 was only 23 million which increased to 230 million during 2000 – 2001.Thankgod, by launching the project tiger we have been able to save the endangered Indian Tiger and to increase its number to a considerable extent. Participation of people is must in tiger conservation.

Short Answer Type Questions

Q.1. Write a short note on family planning programme.

Ans. In 1952, India was the first country in the world to launch a national family planning programme for reducing birth rate to stabilize the population level. Family planning is one of the methods of this programme. In 1967, compulsory sterilization programme after two children was planned. This programme was opposed by the people. This programme was again changed to voluntary programme and came out with a slogan *"Hum do Hamare do"*. Family planning programme is more successful in developed countries rather than in developing countries. The slogan of family planning programme is *"Do se mafi, ek hi kafi"*.

Q.2. Write about wild life sanctuary of J&K.

Ans. Our state is rich in wild life. The Jasrota wild life Sanctuary possesses birds and animals like cheetah. Nandni wild life sanctuary is famous for its diversity of wild life (wonderful species of pheasants). Overa-Aru sanctuary [Pahalgam] contain 30 species for mammals [black bear, brown bear, leopard, musk deer etc] and 100 species of birds. Ram Nagar Sanctuary [close to Jammu] is rich in mammals [Nilgiri, Barking deer, monkey, wild bear] and birds [Mynah, blue rock pigeon, pea fowl, jungle crow etc]

Q.3. What do you mean by sex education?

Ans. Sex education also called sexuality education is an educational programme that is designed to provide learners with adequate and accurate knowledge about human sexuality, sexual identity, relationships and intimacy, it also covers physical and emotional changes associated with puberty and sexual reproduction, as well sexually transmitted diseases [STDs] like AIDS. It also provides

information to young people about birth control, abortion, pregnancy. Sex education can take place both in an out of the school.

Q.4. What do you know family life education?

Ans. Family life education is a process that is designed to assist young people in their physical, social, emotional and moral development as they prepare themselves for adulthood, marriage and parenthood. It helps us to know to study family relationship and peer relationship. It deals with parental care. It deals with issues like aging and social relationship in the socio – cultural context of the family and society. In family life education mother plays a significant role.

Q.5. What do you know about Adult Education?

Ans. It is a programme that contribute to the development of decision making skills including decision regarding one's own family. It is mostly provided to the age group of 15 – 35 years. Women's and girls are key target groups who should be fully informed about inter – relatedness of population education and issue of health, human rights and productivity. It awares adults about pregnancy, births, maternal health etc. it also aware adults about problem of child marriage. It also aware the traditional wrong belief that couples should have children soon after marriage. It also provides information about benefits of a gap (at least of 5 -6 years) between the children.

Q.6. Your friend says that population growth can be controlled by making contraceptives and sterilization if easily accessible. Do you agree? If yes why? If not why not?

Ans. Population can be controlled by making use of contraceptive and sterilization if easily accessible. By making use of contraceptives and sterilization, population growth is checked. They are used

either to limit the family size or for spacing the pregnancies properly. So it is agreed that population growth can be controlled by making use of contraceptives and sterilization if easily accessible. The best example of this is the Taiwanese, who had excellent access to contraceptive had one of the quickest declines in the history.

Q.7. What are the factors that regulate human population?

Ans. Various factors that regulate human population are given below:

a. Food shortage due to crop failure as in china and India.

b. Natural catastrophes like earthquakes, volcanic eruption, drought, floods leads to death of thousand and lakhs.

c. War is another factor for human mortality.

d. Various dreadful and fatal diseases like cholera, plague, small pox etc. wipe out a large number of populations.

e. Accidental death during fire, transportation etc. causes many deaths.

Q.8. What are the most important issues that India needs to include in its population policy?

Ans. National population policy [NPP] addresses the unmet needs for contraception and health care infrastructure. The most important issues that our country India needs to conclude in its population policy are:

a. To integrate development policy.

b. Delay marriage for girls preferably it should be after 20 years of age.

c. Achieve universal access to information / counselling and service for fertility regulation and contraception.

d. Make school education upto middle class [8^{th}] free and compulsory and emphasis on adult education.

Q.9. What is population education and what are its objectives?

Ans. Population education is a recent motivational programme that tries to encourage the people to adapt small population size. It is an instructional programme awaring the people about the facts of population problem. In simple words population education is an awareness programme for young people about increasing population and its allied problems.

Objectives of Population Education

a. To develop an understanding about problems of population explosion.

b. To enable the students to understand that population size is controllable.

c. To aware students about benefits of small population.

Q.10. Differentiate between two types of population growth patterns?

Ans. Two types of population growth pattern are exponential growth and logistic growth and their difference is given below:

Exponential Growth	Logistic Growth
a. It is that growth which exists when the growth rate is proportional to existing amount.	**a.** It is also proportional to the amount but also includes limited resources and competition.
b. It is continuous.	**b.** It is limited.
c. Here is no upper limit.	**c.** Here is upper limit.
d. It shows 'J' shaped growth curve.	**d.** It shows 'S' shaped growth curve.
e. Here environment is constant.	**e.** Here environment is not constant.
f. It occurs in un occupied habitat.	**f.** It occurs in occupied habitat.

Q.11. What is population explosion?

Ans. Rapid increase in population growth is called population explosion. It is a grave problem and is a threat to the process of development of a nation. It leads to poverty, pollutions, unemployment, food problem and energy crisis etc. population explosion is due to illiteracy, poverty, preference to sons, interest in large family, control over death rate etc.

Q.12. Difference between Emigration and Immigration?

Ans.

Emigration	Immigration
It is also called out ward movement.	It is also called inward movement.
It is the departure of some person from existing population to a region to a foreign country.	It is the arrival of some persons from the existing population of a country from outside.
It decreases population size.	It increases population size.

Q.13. What are Hot Spot?

Ans. According to Norman Myers (1988) hot spots are areas that are extremely rich in species, have high endemism and are under constant threat. These are preferential area for in situ conservation. There are 25 terrestrial hot spot in the world. Out of 25 hot spots, two are located in our country extending into neighbouring countries. The hot spot of India are Western Ghats and Eastern Himalaya. These are rich in flowering plants. Fauna include reptiles, amphibians, swallow-tailed butterflies and some mammals.

Q.14. What is Wild Life?

Ans. Wild life can be defined in its real and best spirit as 'all living organisms whether plants and animals lower or higher which occur

naturally and are neither human cultivated, nor domesticated or tamed. Wild life maintains the ecological balance in the nature. In simple words, all undomesticated animals and uncultivated plants is called as wild life. The term wild life was introduced by W. Hornady in 1913.

Q.15. What is Ecological Balance?

Ans. All organisms in a biome depend upon one another in order to survive and control the number of one another. The result of this complete event is a perfect balance in nature. This balance is called ecological balance. Loss of any link in food chain will upset this natures balance and create various problems.

Q.16. Difference between exsitu conservation and insitu conservation?

Ans.

Exsitu Conservation	Insitu Conservation
Conservation of wild life outside their natural habitat is called exsitu conservation.	Conservation of wild life within their natural habitat is called insitu conservation
It includes gene banks, zoos, botanical gardens etc.	It includes national parks, sanctuaries, biosphere reserves etc.

Q.17. Difference between national park and sanctuary?

Ans.

National Park	Sanctuary
It is protected area where protection is given to both flora and fauna.	It is a protected area where protection is given only to fauna.
Grazing is not allowed.	Grazing is allowed.

Cultivation and collection of minor forest products are not permitted.	Cultivation and collection of minor forest products are permitted.
No private ownership right is allowed.	Private ownership is allowed so long they do not interfere with the wellbeing of animals.
In India there are more than 92 National parks at present.	In India, there are more than 500 sanctuaries at present.
Boundaries of national parks are well defined.	Boundaries of Sanctuary are not well defined.

Q.18. What is conservation and what are its objectives?

Ans. The word conservation is derived from two latin words; con = together and servare = to guard. So meaning guard together. According to WCS, conservation is the management of human use of the biosphere which may yield greater benefits to the present generation while maintaining its potential to meet the needs and aspiration for future generation. In simple words, conservation is defined as the judicious and wise use of biosphere.

Objectives [aims] of conservation

a. To preserve the biodiversity.

b. To maintain the ecological balance.

c. To ensure the existence of species and sustainability of the ecosystem.

Q.19. What are the steps taken by government of India to conserve wild life?

Or

What are the various steps taken by government of India foe the management of wild life?

Ans. Some important steps taken by government of India to conserve wild life are as under:

a. It established IBWL [1952] to conserve country's wild life.

b. India enacted Wild life Protection Act 1972.

c. It established wild life department in each state to protect wild life.

d. It has introduced wild life chapters in school curriculum.

e. India being a signatory of IUCN.

f. A wild life week is observed every year since 1955.

g. World Wild Fund for nature India [WFI] was launched in 1969 [head quarter Mumbai]. It initiated projects to protect fast endangered species in India like tiger, loin etc.

h. Bombay Natural History Society [BNHS] 1883 engaged in collection of the information and specimen of plants and animals.

Q.20. Write main objectives of wild life protection act 1972.

Ans. Objectives of wildlife protection act are as:

i. Protection and conservation of all types of organisms.

ii. Ban on poaching.

iii. Breeding and management of wildlife in captivities.

iv. Setting of national park, sanctuaries, biosphere reserves, zoos etc.

Q.21. Write a short note on project tiger.

Ans. Tiger project is a project launched in India for protection and breeding of tigers to increase their population. Different tiger reserves were set up in various parts of the country under this project. There were 47 tiger reserves and the number of tigers increased to 2622.

Q.22. What do you know about the Red Data Book?

Ans. The survival service commission [SSC] of IUCN has long maintained a list of texa that faces the risk of extinction throughout the world which is called as Red List or Red Data Book. Red data book of Indian plants containing about 200 rare, endangered

species. Red data book keep accurate and complete list or record of rare, endangered, vulnerable species of plants and animals. According to Red Data Book; more than 1000 creatures are threatened with extinction, some very soon, and some within a decade or so. Among these are all species of Rhinoceros, Royal Bangal and Siberian tigers, the red wolf, the mountain gorilla, Arabian Oryx and Asiatic lion.

Q.23. What would be the disadvantage of Tehri Dam?

Ans. The Tehri dam situated on Bhagirathi river [UP] has following disadvantages,

a. It has already displaced over 58000 people.
b. It has submerged nearly 100 villages.
c. If it is damaged, it can submerge and then destroy the fertile agricultural land.
d. If it gets blocked by silt and mud, it would require a huge sum for cleaning.

Q.24. What would be the disadvantages of Narmada Valley Project?

Ans. **a.** It would displace over one million people.
b. It would submerge 56000 hectare of fertile agricultural land and about 60000 hectares of forest land.
c. It would make about 25 species of birds, plant, animals and microbes homeless.

Q.25. Difference between s – shaped growth curve and j – shaped growth curve?

Ans.

S – shaped	J – shaped
a. It has five phases-lag phase, positive acceleration phase, negative phase, stationary phase and exponential phase.	**a.** It has two phases – lag and exponential phase.

b. Finally population shows zero growth rate	**b.** Finally population shows population crash.
c. e.g. Man, Yeast cells etc	**c.** e.g annual plants reindeer etc.

Q.26. Difference between Natality Rate and Mortality Rate?

Ans.

Natality Rate	Mortality Rate
a. It is the production of new individuals in the population per year.	**a.** It is the removal of individuals from the population per year.
b. Finally population shows zero growth rate	**b.**Finally population shows population crash.
c. e.g. Man, Yeast cells etc	**c.** e.g annual plants reindeer etc.

Q.27. Write a note on Nilgiri Biosphere reserve?

Ans. Nilgiri biosphere reserve is the most important biosphere reserve of India. It was setup in the year 1986. The biosphere reserve is spread over three southern states viz Kerela, Karnataka and Tamil Nadu and has an area over 5520sqkm. The biosphere accommodates over 100 species of mammals, 550 species of birds, 30 species of reptiles etc.

Q.28. What are the functions of biosphere reserve?

Ans. Biosphere reserve serves following functions:

a. These helps in conservation of ecosystem, species and other resources.

b. These help in promotion of economic development.

c. These are helpful in promoting scientific research and education.

Q.29. Write a note on Dachigam National Park.

Ans. Dachigam National Park is located in J&K state just 20km away from the Srinagar city in Dachigam area. It is spreaded over an area of 163.25sq.kms. it is famous for Hangul, it possesses 20 mammals

including Himalayan brown bear, Himalayan black bear, langur, long tailed marmot, leopard etc. it is also rich in avifauna like monal, bearded vulture, griffon vulture, golden eagle, grey heron, golden oriole, black bulbul. It also contains variety of vegetation type.

Q.30. What is meant by growth rate of any population?

Ans. The rate at which the population change constitute growth rate. The growth rate of a population is expressed as the number of individuals by which a population increases divide by the amount of time that passes while this increase is taking place.

Q.31. What is the role of government in forest conservation?

Ans. Government plays an important role in forest conservation. Some of the important roles are as:

a. Government enacted forest protection act which provides complete protection of forests.

b. Various governmental agencies organize forest awareness programmes at local district and state level.

c. Govt provide jobs to educated youth in forest departments which check felling of trees in forests and ensure plantation in degraded forest lands.

d. Govt. has introduced various forest related chapters in school curriculum.

e. Govt. has created forest department for forest conservation.

f. Forest Day is celebrated every year in March 21.

Q.32. What are the conflicts surrounding forest areas?

Ans. A number of people live especially tribals in and around the forest areas. They use the forest in one hand by using minor forest products and on other hand they conserve these forests. In recent years, they have been regulated to do so. This has resulted in degradation of forest and large scale deforestation. So, these people

should be allowed to use the minor forest products in order to conserve the forests. Tourism and development projects are cause of concern for conflicts surrounding forest areas.

Q.33. What are the various purposes of JFM programme?

Ans. The various purposes of JFM programme are as:

a. To protect and maintain the already existing but fast depleting forests and water resources.

b. To increase greenery in degraded forests.

c. To create a sense of sustainable development of forest resources.

d. Empowerment of the local communities for decision making in the forest use.

Q.34. What do you mean by biodiversity?

Ans. The environment which we encounter and with which we interact in our day today life comprising of millions of living organisms including bacteria and viruses. These are collectively called as biological diversity. In other words, the total number of races, varieties or species i.e sum total of various types of microbes, plants and animals present on the planet earth is called biological diversity. If we observe a patch of forest, we may find wide range of plant and animal life. The plant life may range from a small herb to a large tree and animal life may vary from a tiny insect to a large mammal. According to stock and Wilson (1988) there are ten million species present on this planet and nearly few million yet to be identified, India has 45000 species of plants and among them 17000 are flowering plants. Among animals, India has 1230 species of birds, 320 species of mammals, 400 species of reptiles, 2000 species of fishes, 142 species of amphibians and 60,000 species of insects.