HUMAN POPULATION AND REPRODUCTIVE HEALTH

Introduction

History of man is only about 50,000 years old. In the course of human history there have been three major explosions, each corresponding to a major changes in the environment. The first population explosion occurring about 20,000 years ago. It was brought about by the use of tools that allowed improvement in hunting and food gathering methods. The second revolution occurred about 6,000 years ago, and was brought by improvements in farming. The third revolution was brought about 300 years ago and was caused by improvement in food production, industry and medicine. If the present birth rate is maintained, it is stated that only one square feet of the earth surface will be available per one person within the next 700 years.

Definition : The term population refers to the total number of individuals of the same species occupying a particular geographic area at a given time. This definition of population was given by **Clark** in 1954.

Demography : The scientific study of human population is called **demography.** It deals with

(i) Change in population i.e. growth or decline in population.

(ii) Composition of population i.e. age groups, sex ratio etc.

(iii) Distribution of population in space.

Census : Census is an official count of the people of a country, state, or district, with statistics as to age, sex, employment, education, etc. In India census started in 1891, and, since then, it has been conducted uninterruptelly every ten years. Census is conducted as per the provision made under the census Act, 1948, as amended.

15.1 Population Dynamics

(i) **Population density :** Population density is the number of individuals present per unit area or volume at a given time. For instance, number of animal per square kilometer, number of trees per area in a forest, or number of plank tonic organism per cubic meter of water. If the total number of individuals is represents by letter N and the number of units of space by Letter S, the population density D can be obtained as D=N/S. Space is indicated in two dimensions (m^2) for land organisms, and in three dimensions (m^3) for aquatic organisms and for the organisms suspended in space.

(ii) **Birth rate or Natality :** The birth rate of a population refers to the average number of young ones produced by birth, hatching or germination per unit time (usually per year). In the case of humans, it is commonly expressed as the number of births per 1000 individuals in the population per year.

The maximum birth rate of a species can achieve under ideal environmental conditions is called potential natality. However, the actual birth rate under the existing conditions is much less. It is termed

realised natality. Crude birth rate is the number of births per 1000 persons in the middle of a given year i.e. on July. Natality increases the population size (total number of individuals of a population) and population density.

(iii) **Death rate or mortality :** The death rate of a population is the average number of individuals that die per unit time (usually per year). In humans it is commonly expressed as the number of death per 1000 persons in a population per year. Lowest death rate for a given species in most favourable conditions is called potential mortality, while the actual death rate being observed in existing conditions is called realized mortality. Crude death rate is the number of deaths per 1000 persons in the middle of a given year i.e. on July. Mortality decreases the population size and population density both.

Difference between Natality rate and Mortality rate

Character	Natality rate	Mortality rate
(1) Definition	Number of births per 1,000 individuals of a population per year.	Number of deaths per 1,000 individuals of a population per year.
(2) Population density	Increases population size and population density.	Decreases population size and population density.

(iv) **Vital index :** The percentage ratio of natality over mortality is known as vital index i.e. natality / mortality ×100. It determines the growth of a population.

(v) **Immigration :** It is permanent entry of additional person into the existing population of a country or region from out side. Example; Many Nepalese and Chinese come to settle in India.

(vi) **Emigration :** It is the permanent departure of some persons from the existing population of a region to a different state or a foreign country. Example; Many Indians go to Western countries to settle there.

Immigration and emigration bring about redistribution of population, and are common in animals. These occur for various reasons, such as search for food, escape from competition due to overcrowding, need of shelter etc.

(vii) **Sex ratio :** The number of females in a population per 1000 males is called sex ratio.

$$\text{Sex ratio} = \frac{No.of\ females}{1000\ (males)}$$

(viii) **Age structure :** The age structure of a population is the percentage of individual of different ages such as young, adult and old. Age-sex structure of a population can be shown by a pyramid-like diagram by plotting the percentage of population of each sex in each age-group. Figure shows the age-sex structural pyramids for India over the 20-year period from 1971 to 1991. These pyramids show that Indian population may still take many years to be stabilized.

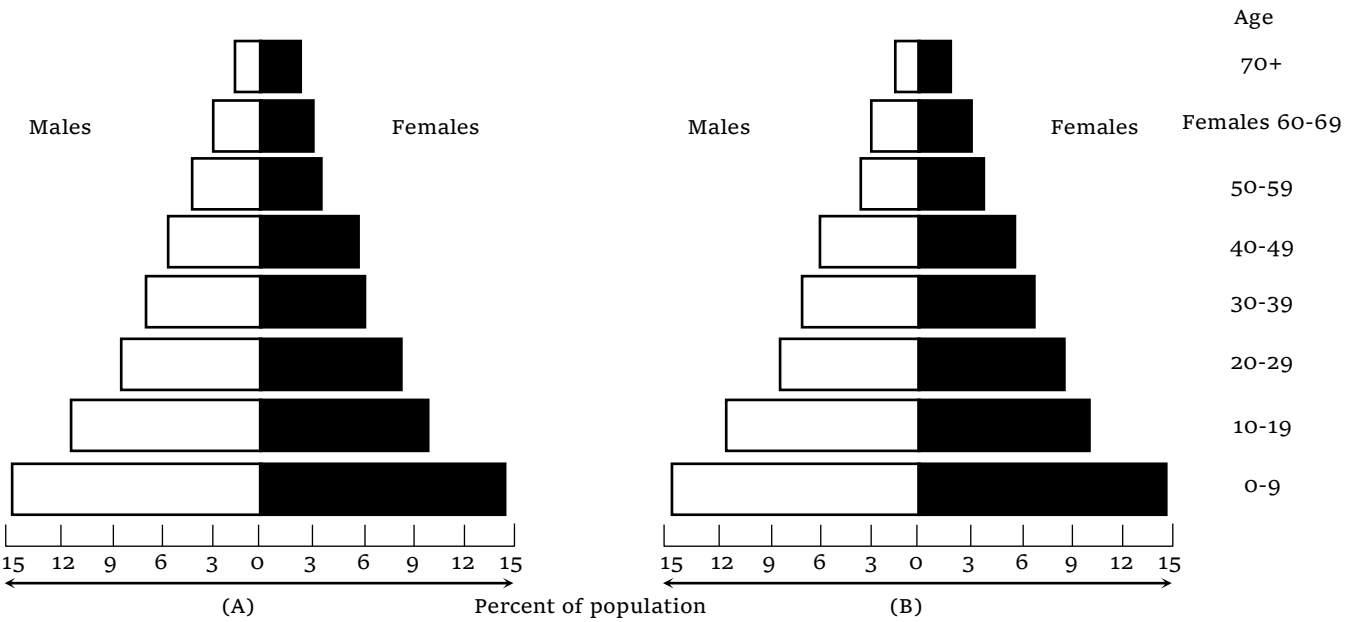


Fig : Comparative age-sex pyramids for India : (A) Year 1971 (B) Year 1991

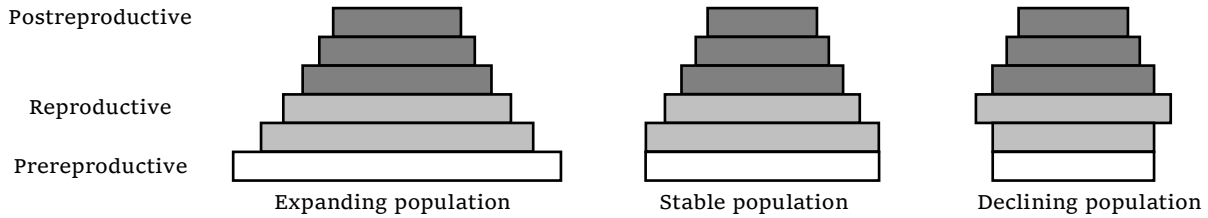
(ix) **Age distribution :** The relative abundance of the organisms of various age groups in the population is called age distribution of population. With regard to age distribution, there are three kinds of population.

(a) **Rapidly growing or Expanding population :** It has high birth rate and low death rate, so there are more number of young individuals in the population.

(b) **Stationary or stable population :** It has equal birth and death rates, so population shows zero population growth.

(c) **Declining population :** It has higher death rate than birth rate, so the population of young members is lower than that of old members e.g. Japan (Ageing population) .

Human population has three age groups : Pre reproductive, Reproductive, and post reproductive.



Factors affecting the age composition

(1) Number of infants below one year of age and the older people as these have higher mortality rate than individuals of other age groups.

(2) Proportion of reproductive active males and females in a population.

(3) Number of females in active reproductive age (i.e. between 15 to 44 years)

(x) **Change in Population Size and Growth Rate :** Whether a population grows, declines or maintains it size depends upon the balance between the above factors:

Change in Population Size during time interval	= (Birth + Immigration during time interval) – (Death + Emigration during time interval)

The above expression in words may be represented in a simple way by a mathematical model. suppose N = population size and *t* = time. The Greek letter delta, Δ, indicates change. We can now represent change in population as ΔN, and time interval as Δt. The verbal equation can be written as $\Delta N/\Delta t$=(B+I) – (D+E) in which B is absolute number of births in the population during the time interval, and D =the absolute number of deaths during that interval; I means immigrant and E, emigrants. I and E , being insignificant, may be ignored. Then the equation simplifies to $\Delta N/\Delta t$ =B-D.

Migration is a two-way movement of a population for adjusting to seasonal changes. It occurs in some fishes (*Anguilla,* an eel), birds (Siberian crane), and mammals (fur seal). Migration is not considered a determinant of population size.

Annual average growth rate is the percentage of increase in population size per year. It can be calculated with the help of following equation :

$$\text{Annual growth rate (\%)} = \left(\frac{P_2 - P_1}{P_1 \times N} \right) \times 100$$

Where P_1= Population size of previous census. P_2= Population size of present census.

N= Number of years between the two census.

15.2 Growth of Human Population

Population growth refers to the increase in its size. It is determined by the number of individuals added to the population and the number of individuals lost from the population. Addition occurs by births and immigration. Loss results from deaths and emigration. If more individuals are added than are lost i.e., the vital index is more than 100, the population will increase or show **positive growth.** If more individuals are lost than are added i.e., the vital index is less than 100, the population will decrease or show **negative growth.** If addition and loss are balanced, i.e., the vital index is 100, the population will become stationary or show **zero growth**.

(i) **Malthus Theory of Human Population Growth :** Thomas Malthus, a British political economist, put forward a theory of human population growth in 1778. Malthus in his "Essay on the principle of population" pointed out that population tends to increase in geometric progression while food supply increase only in arithmetic progression. Faster growth of population than of its requirements causes an imbalance between the two. When this imbalance reaches a certain limit, environmental factors like famine, epidemic of a disease, earth quake, flood, war etc reduce the population to a size, the available resources can support. The factors that control the population size were called positive checks by Malthus.

(ii) **Natural Control of Population Growth :** Growth of a population is controlled by an interaction between three factors : biotic potential, environmental resistance and carrying capacity of environment.

(a) **Biotic or reproductive potential :** Biotic potential is the natural capacity of a population to increase at its maximum rate under ideal environmental conditions and stable age and sex ratios. The biotic potential for all animals is very high. If unchecked, the numbers of any species will quickly over

run the world. Biotic potential in the human female is estimated to be about 12 per female during its reproductive period between the puberty and the menopause period.

(b) **Environmental Resistance :** In nature full biotic potential of an organism or population is never realized, since conditions are rarely ideal. Various harmful environmental (abiotic) factors like non-availability of food and shelter, natural calamities like drought, cloud bursts, floods, fires, temperature fluctuations, accidents, etc. and certain biotic factors like pathogens, parasites, predators etc. check the biotic potential from being realized. The sum of all these inhibitory factors is called **environmental resistance**. Thus, actual increase is the balance between biotic potential and environmental resistance. Thus environmental resistance does not allow population growth so soar towards infinity**.**

(c) **Carrying capacity :** It is defined as "Feeding capacity of an environment of an ecosystem for a population of a species under provided set of conditions". It is also defined as the "Level beyond which no major increase can occur". This limit is a constant and represented by K. When a population reaches the carrying capacity of its environment, the population has zero growth rate. So the population generally stabilizes around the carrying capacity. The carrying capacity of the earth for human population is considered to be about 8 to15 billions. Carrying capacity of the environment for a population depends upon three major components :

(1) **Productive systems** which produce food and fibre e.g. croplands, orchards, etc.

(2) **Protective systems** which buffer air and water cycles and keep moderate environmental temperatures e.g. ocean etc.

(3) **Assimilative systems** which utilize the wastes produced by human activities e.g. waterways, wetlands, etc.

Productive system and protective systems collectively form the **life-supporting capacity,** while assimilative systems collectively form the **waste assimilative capacity.**

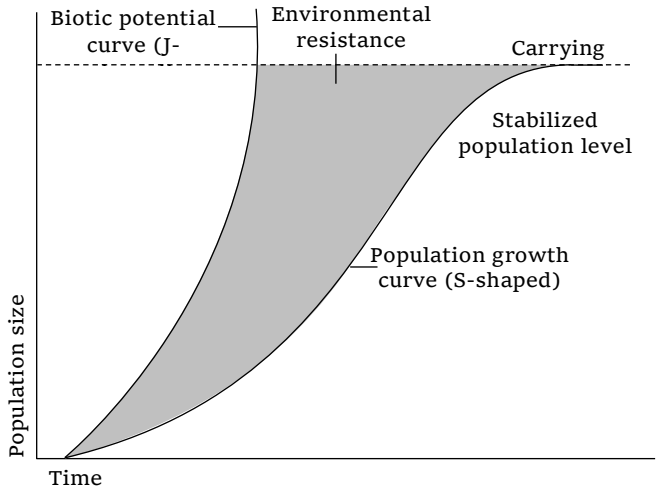


Fig : The theoretical relationships between biotic potential, environmental resistance and carrying capacity

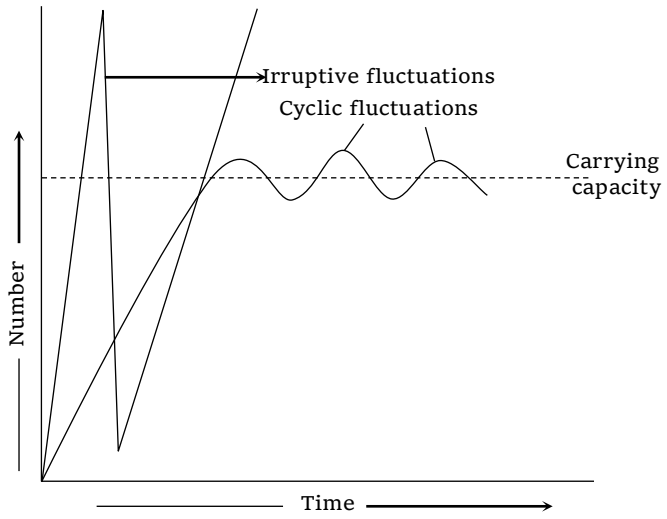


Fig : Cyclic and irruptive fluctuations in populations

(d) **Population fluctuations and population cycles :** The populations are not stable and do change due to a number of extrinsic as well as intrinsic factors. These variation in the population size are of two types :

(1) **Population fluctuations or irruptive variations :** In these changes, population density tends to fluctuate irregularly above and below some steady-state level. These are characterized by sudden increase in population in short time which is followed by equally quick decrease in population size. These are caused by random seasonal or annual changes in availability of resources (food or energy) or extrinsic factor (e.g. temperature, rainfall etc.) e.g. more birds during early summer due to their hatching period, more insects during summer months and more weeds in rainy season.

(2) **Population cycles :** These are regular changes in the population size. In these, population size is nearly constant over long period of time. These are caused by seasonal changes in environment e.g. population cycles (of 3 to 4 years) of lemmings of Tundras (Elton, 1942) Lemmings (*Lemmus lemmus*) (small mouse-like rodents found in arctic regions of Canada and Norway) increase in their number for a period of about 3 years when it reaches a peak beyond the carrying capacity of that area. They eat up all the available food. In the winter months, the lemmings migrate in large numbers in the sea and swim till they are drowned due to exhaustion. The surviving lemmings multiply and repeat the process.

(iii) **Patterns of Population Growth :** Growth of a population can be expressed by a mathematical expression, called growth curve in which logarithm of total number of individuals in a population is plotted against the time factor. Growth curves represent interaction between biotic potential and the environmental resistance.

Two basic types of growth curves :

(a) **Sigmoid or S-shaped growth curve :** It is shown by yeast cells and most of organisms. It is formed of five phases :

(1) **Lag phase.** In which the individuals adapt themselves to the new environment, so there is no or very little increase in population.

(2) **Positive Acceleration phase.** It is the period of slow increase in population in the beginning.

(3) **Logarithmic** or **Exponential phase :** It is the period of rapid rise in population due to availability of food and requirements of life in plenty and there being no competition.

(4) **Negative Acceleration phase :** In which again there is slow rise in population as the environmental resistance increases.

(5) **Stationary (Plateau) phase :** Finally, growth rate becomes stable because mortality and natality rates become equal to each other. So there is zero growth rate. A stable population is said to be in equilibrium, or at saturation level. This limit in population is a constant *K* and is imposed by the carrying capacity of the environment. S-shaped curve is also called logistic curve. Sigmoid growth curve was described by **Verhulst, (1839)**

(b) **J-shaped Growth curve :** It is shown by small population of **Reindeer** experimentally reared in a natural environment with plenty of food but no predators. It has only two phases:

(1) **Lag phase :** It is period of adaptation of animals to new environment so is characterized by slow or no growth in population.

(2) **Logarithmic or Exponential phase :** It is characterized by rapid growth in population which continues till enough food is available. But with the increase in reindeer population, there is corresponding decrease in the availability of food and space, which finally become exhausted, which leads to mass starvation and mortality. This sudden increase in mortality is called **population crash.**

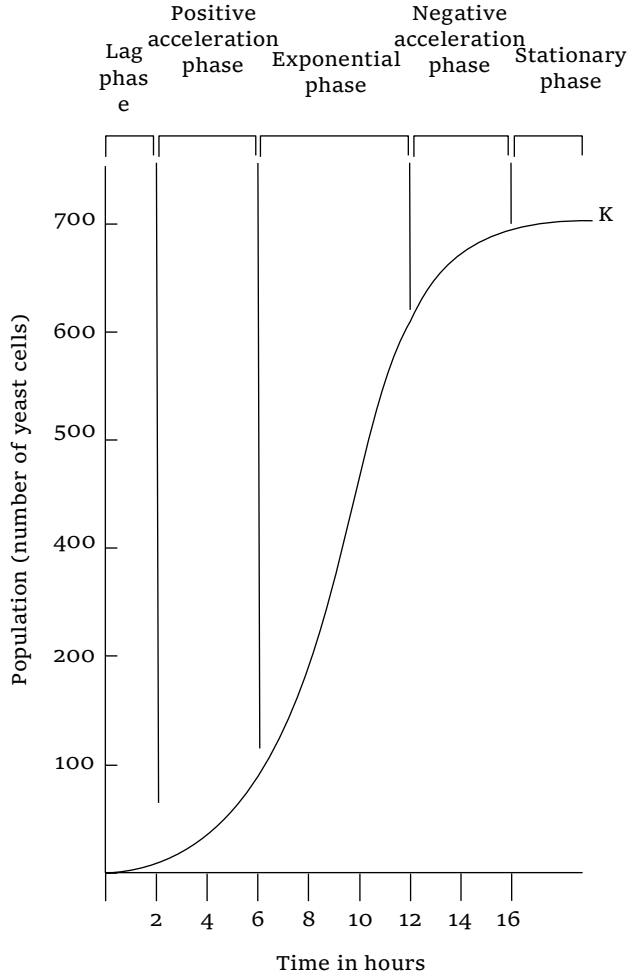


Fig : The S-shaped growth curve of yeast cells

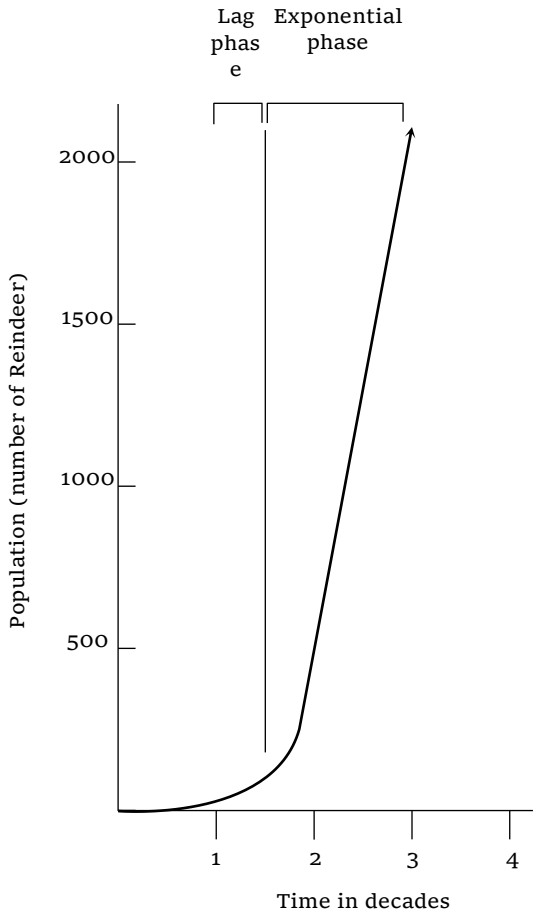


Fig : The J-shaped growth curve of reindeer

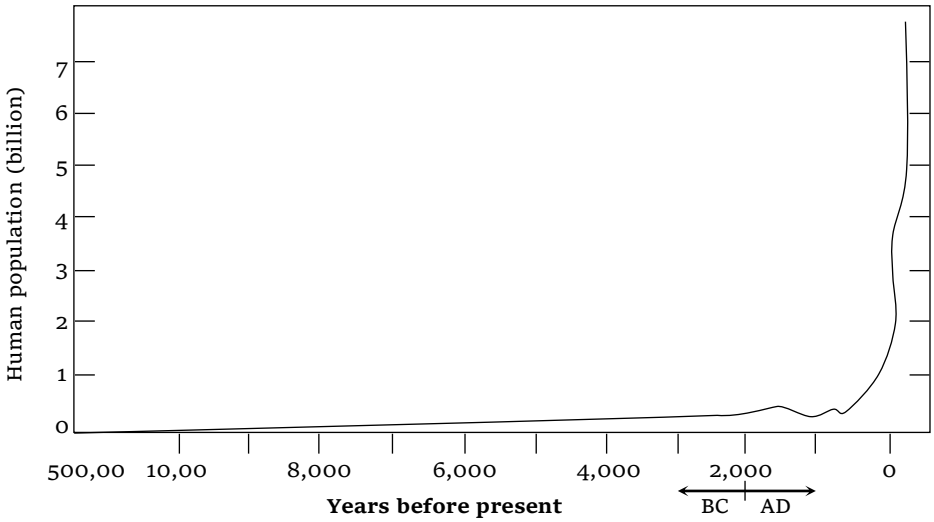
Lemming of Tundra, some insect, algal blooms and annual plants also show J-shaped curves. The population growth curve is S- shaped in most of the organisms, Human population also shows S-shaped curve.

Difference between S-shaped and J-shaped Growth curves.

S.No.	S-shaped Growth Curve		J-shaped Growth Curve
(1)	It is formed of 5 phases : lag phase, positive acceleration phase, exponential phase, negative acceleration phase and stationary phase.	(1)	It is formed of 2 phases : lag phase and exponential phase.
(2)	Finally the population shows zero growth rate as birth rate equals death rate.	(2)	Finally, the population shows a population crash due to rapid increase in mortality rate.
(3)	*Examples.* Yeast cells in a culture medium.	(3)	*Examples.* Reindeers, algae blooms, lemmings of Tundras

(c) **Human Population Growth Curve :** The modern man (*Homo sapiens sapiens)* appeared about 25,000 years ago. For a very long time, the human population remained in the lag phase, having

little or very slow growth. By the year 1 A.D., there were about 0.25 billion people in the world, and by 1600 about 0.5 billion. Thus, it took 1600 years for the population to become double. The exponential phase of growth of the human population started about 1750. Since then, the time taken by the population to become double has considerably shortened. It doubled in 200 years (1600-1800 A.D.), becoming 1 billion; then doubled in 130 years (1800-1930 A.D.), growing to 2 billion; then doubled in only 45 years (1930-1975 A.D.), reaching about 4 billion. At present, the world human population grows at a rate of 2 percent a year, and it has now reached 6 billion. If the present growth rate persists, there would be 8 billion people on earth by the year 2017.



World population gain is 2 persons every second; 200,000 people every day; 8 million every month; and 70 million every year. The high rate of growth is often referred to as "**population explosion"** The word "explosion" may be defined as a rapid and expansive change of state.

The future of human population is difficult to predict. It may stabilize and have S-shaped growth curve or decline rapidly and have J-shaped growth curve. The population will stabilize if the birth and death rates are balanced in the near future. It will rapidly decline if it overgrows the carrying capacity of the environment.

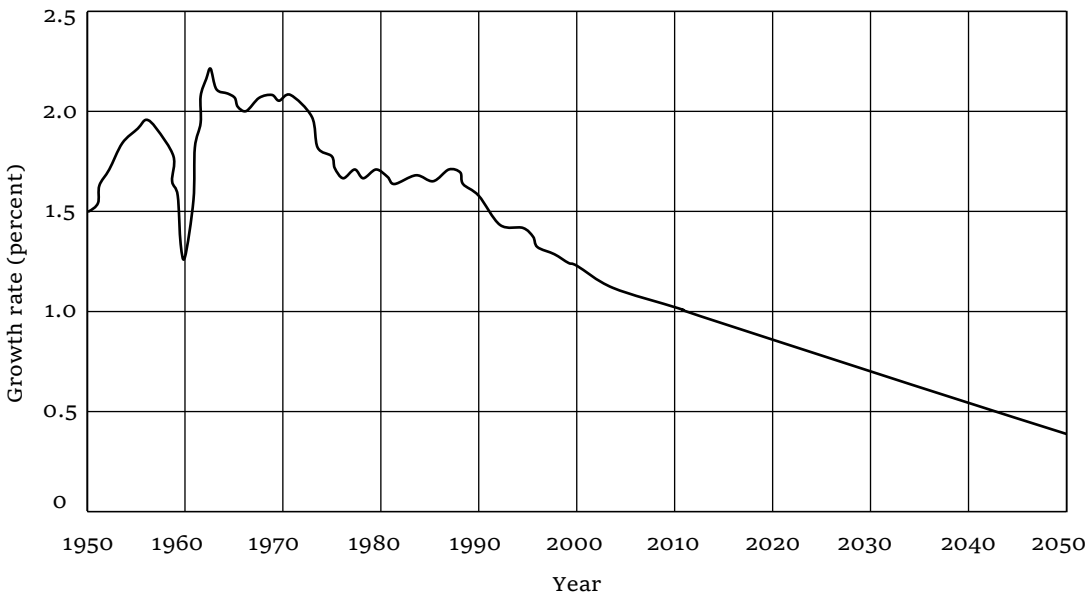


Fig : Projected world population growth rate between 1950 and 2050 (based on United States census bureau, international data)

A demographic cycle is formed of 5 stages

(a) First stage (High stationary)	*High birth rate and high death rate. Population stationary.*	*India till 1920.*
(b) Second stage (Early expanding)	*Declining death rate but high birth rate.*	*Many countries in S. Asia and Africa.*
(c) Third stage (Late expanding)	*Declining birth and death rates but still birth rate higher than death rate.*	*India, China and Singapore.*
(d) Fourth stage (Low stationary)	*Low birth rate and low death rate. Population stationary.*	*Austria (with zero growth rate during 1980-85) Denmark, Sweden, Belgium etc.*
(e) Fifth stage (Declining)	*Birth rate lower than death rate.*	*Germany and Hungary.*

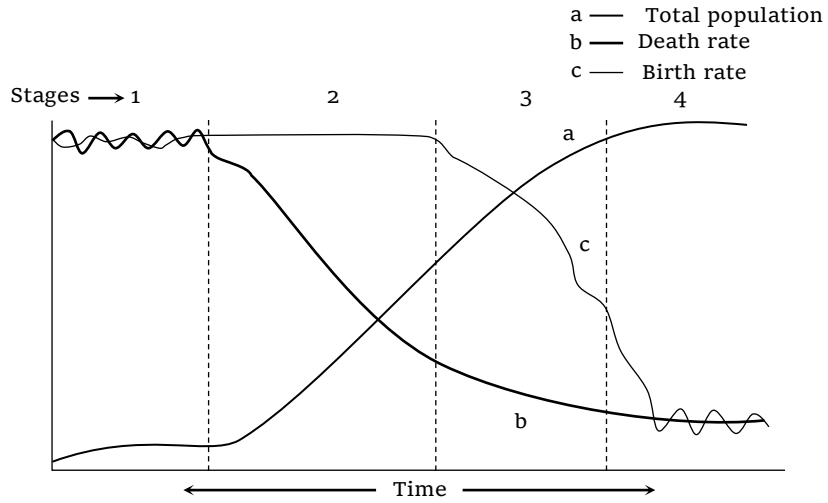


Fig : Different stages of the demographic transition
1. High birth rate but fluctuating death rate
2. Declining death rate and continuing high birth rate
3. Declining birth and death rate
4. Low death rate but fluctuating birth rate

15.3 Population Trends in the World and India

(i) Population Trends in the World

The distribution of human population is not uniform throughout the world. Only about one third of the total land area is inhabited. Of the inhabited areas, some are thickly populated, others sparsely. This depends upon the availability of the requirements of life. About 56% of the total world population resides in Asia alone. Bangladesh is the most thickly populated country, and Australia, the most thinly populated.

Annual Birth, Death and Growth Rates for Human Population in 1973

S. No	Region	Population (Millions)	Average Annual Birth Rate per 1,000 Individuals	Average Annual Death Rate per 1,000 Individuals	Annual Growth Rate Percent
(1)	World	3860	33	13	2.0
(2)	Developed Countries	1120	17	9	0.8
(3)	Developing Countries	2740	39	14	2.5

Birth and Death rates in selected countries in 1979

S. No.	Country	Birth Rate	Death Rate
(1)	Sweden	11.6	11.0
(2)	England	13.0	12.1
(3)	Japan	14.6	6.0
(4)	Canada	15.5	8.3
(5)	USA	15.8	8.7
(6)	China	18.0	6.0
(7)	India	35.0	13.6
(8)	Bangladesh	45.7	14.2
(9)	Pakistan	45.7	14.2

(ii) **Population Trends in India**

(a) **Population :** India with a population of 1027 million as 2001 census stands second in the world. The world leader in the matter of population is China with a population of 1160 million. India has only 2.42% of the world's land area but supports over 15.5% of the world's population. Thus, one in every 6 persons in the world is an Indian. India's population has been steadily rising since 1921. However, from the year 1921, often called the "big divide", its population started to swell up sharply. India's population has increased 3 times since independence (1947) when its population was 340

million. About 1800 individuals are born every hour, 17 million every year. India's population crossed one billion (100 crores) mark on May 11, 2000.

(b) **Sex Ratio :** Sex ratio is defined as the number of females per thousand males in a country or state. Sex composition is affected by three factors : (i) differentials in male-female ratio at birth, (ii) differentials in mortality conditions of males and females, and (iii) sex-selective migration. India is one of the few countries where the males are more than the females. There has been a steady decrease in the female population since 1901 except during the period 1971-81 when there was some increase. There are at present 531,277,078 males and 495,738,169 females in our country. The sex ration is 933 females per 1,000 males. In Kerala, there are 1058 females per 1000 males, highest sex ratio among the states, In Daman & Diu, there are only 709 females per 1000 males. In Haryana, there are 861 females per 1000 males, lowest sex ratio among the states.

(c) **Literacy Rate :** The literacy rate was 65.28% according to the 2001 census. It was 76.40 % for males and 54.16% for females. The literacy rate has been steadily increasing since 1951. Among the Union Territories, Lakshadweep has the highest literacy rate of 87.52%. Literacy rate is highest in Kerala (90.92%) and lowest in Bihar (47.53%). Any person who can read and write with understanding in any language is recorded as literate in census. All children below 7 years are shown as illiterate in the census.

(d) **Factors Favouring Population Growth**

(1) Decrease in death rate.

(2) Increase in average life span.

(3) Better medical facilities.

(4) Control of insect vector's of fatal diseases and epidemics.

(5) Better sanitation.

(6) Proper care of new-born children and their mothers.

(7) Better nutrition and life amenities.

(8) Protection against wild life and adverse whether through living in houses.

Details of India's Population of 1981, 1991 and 2001

Data		1981 Census	1991 Census	2001 Census	Rise/ Fall
Population :	Total	683,329,097	843,930,861	1,027,015,247	+
	Males	364,214,409	437,597,929	531,277,078	+
	Females	319,114,688	406,332,932	495,738,169	+
Decennial Population Growth :	Absolute	135,169,445	160,601,764	183,084,386	+
	Percentag	24.66%	23.50%	21.34%	–

	e				
Annual Population Growth Rate		2.46%	2.35%	2.13%	–
Population Density per square Kilo metre		216	267	324	+
Sex Ratio		934 Females Per 1000 Males	929 Females Per 1000 Males	933 Females Per 1000 Males	+
Literacy Rate :	Total	43.56%	52.11%	65.38%	+
	Males	56.37%	63.86%	75.85%	+
	Females	29.75%	39.42%	54.16%	+

Density of Population India, 1901-2001

Sex Ratio (Females per 1000 Males) In India, 1901-2001

Year	Density per Km^2		Year	Sex Ratio
1901	77		1901	972
1911	82		1911	964
1921	81		1921	955
1931	90		1931	950
1941	103		1941	945
1951	117		1951	946
1961	142		1961	941
1971	177		1971	930
1981	216		1981	934
1991	267		1991	927
2001	324		2001	933

Percentage Age Groups in India

	0-14 Years	15-59 Years	60 plus Years
1970	42	54.5	3.5
1980	40	54.8	6.2
1990	36	57.5	6.5
2000	31.7	60.8	7.6

Parameters of 2001 census

- **Population** 1027.015
  (+183 million)
  Males =531.277 million
  Females = 495.738 million
- **Population density**..... 324 persons/sq. Km. (+60 persons/sq. Km.).
- **Sex ratio**..... 933 F : 1,000 M.
- **Absolute decennial population growth .....** +183 million.
- **Percent decennial population growth**..... 21.34%(-2.52).
- **Literacy rate**..... 65.38%(+13.27%).
- **Male literacy**..... 75.85%.
- **Female literacy..**..... 54.16%(+14.74%).
- **Birth rate**..... 26 per 1,000.
- **Death rate**..... 8 per 1,000.

Other Information about Census 2001 :

- Most populous state of India = **Uttar Pradesh** (166 millions) (18.17%).
- Second Most populous state of India = **Maharashtra** (95 millions).
- Least populous state of India = **Sikkim** (5.40 lakh).
- Most densely populated state of India = **West Bengal** (904 persons per sq. Km.).
- Second most densely populated state of India = **Bihar** (880 persons per sq. Km.).
- Least densely populated state = **Arunachal Pradesh** (13 persons per sq. Km.).
- Union territory with maximum population density = **Delhi** (9,294 persons per sq. Km.).
- Union territory with minimum population density = **Andaman and Nicobar** (43 persons per sq. Km.).
- State with highest Decennial population growth = **Nagaland** (64.41%).
- State with lowest Decennial population growth = **Kerala** (9.42%).
- Average life expectancy in India = **64 years.**
- Sex ratio in Kerala state = **1,058 F :1,000 M.**
- State with highest literacy rate = **Kerala 90.92%** (94.2% in males and 88% in females).

Important Tips

National Population Policy-2000 : Main objective

- Aims for population stabilization by 2045 A.D.
- Compulsory school education upto 14 years of age.
- Reduction of infant mortality rate from the current 72 per 1,000 live births to 30 by 2010.
- Reduction of maternal mortality rate from 407 per 100,000 live births to 100.
- Reduction of TFR from 3.3 to 2.1 by 2010.
- To promote delayed marriage for girls, not earlier than age 18 preferably after age 20.
- 100 per cent registration of births, death, marriage and even pregnancy.
- Promotion of small family norms
- A people-centered family welfare program.
- Promoting the two-child norm.
- Freeze on current Lok Sabha strength to be extended from 2001 to 2026.
- Facilities for safe abortion to be increased.
- Strict enforcement of Child Marriage Restraint Act and Pre-Natal Diagnostic Technique Act.
- A National Commission of Population chaired by the Prime Minister has been announced to guide and implementation of the policy.

First Human Development Report (April, 2002) :

- Best stated to live in : Kerala (1); Punjab(2); Tamil Nadu(3); Maharashtra(4) and Haryana(5).
- Human development index improved by 3% a year from 1993-94 to 2001. Urban-rural disparities declined.
- Percent of people below the poverty line declined from 44.5% in 1983 to 36% in 1993-94.
- Gender equality index moved from 62% in the 1980s to 67.6% in the 1990s.
- Kerala has been declared as the "**First baby-friendly state of world**".
- In 1991-2001 decade, Andhra Pradesh achieved the sharpest decline in the annual growth rate of population (from 2.2 per cent in 1981 –91 to 1.3 per cent).
- In India, Tamil Nadu and Karnataka state have attained replacement levels of fertility.
- Government of India is planning to introduce a Bill in Parliament to make education upto eight standard compulsory.
- In India, marriageable age is 18 years for female and 21 years for males.

15.4 Methods of Birth Control

Meaning : The regulation of conception by preventive methods or devices to limit the number of offspring is called birth control.

Methods : A variety of methods are known for birth control. The birth control methods which deliberately prevent fertilization are referred to as contraception. These methods are of 2 main types : temporary and permanent.

(i) **Temporary Methods :** These are further of many types –

(a) **Safe Period (Rhythm Methods) :** A week before and a week after menses is considered the safe period for sexual intercourse. The idea is based on the following facts-

(1) Ovulation occurs on about the 14^{th} day (may be 13^{th} to 16^{th} day) of menstruation.

(2) Ovum survives for about 1-2 days.

(3) Sperms remain alive for about 3 days.

This method may reduce the chances of pregnancy by about 80 percent. However, a great care is needed in its use. Rhythm method is also called natural family planning. It is also termed temporary abstinence because it requires refraining from sexual intercourse when conception is most likely, *i.e.*, a few days before and a few days after ovulation. Changes in cervical mucus and body temperature during the menstrual cycle mark the ovulation time. Thus, the natural family planning requires adequate knowledge of these physiological signs. Some couples use the natural family planning method of increase the chances of conception so that unplanned pregnancies are avoided.

(b) **Coitus Interruptus :** This is the oldest method of birth control. It was in use over 2,000 years ago. It involves withdrawal of the penis from the vagina by the male before ejaculation so that semen is not deposited in the vagina and there is no fertilization. This method also has some drawbacks. Male produces some lubricating fluid from his Cowper's glands before ejaculation. This fluid contains many sperms. A lapse in timing or willpower may result in late withdrawal and hence pregnancy.

(c) **Spermicides :** Foam, tablets, jellies, pastes and creams, if introduced into the vagina before sexual intercourse, adhere to the mucous membrane and immobilise and kill the sperms. These contain seprmicides such as lactic acid, citric acid, boric acid, potassium permanganate and Zinc sulphate.

(d) **Mechanical Means :** These are of 3 types :

(1) **Condom** (Nirodh) is a thin sheath, usually made of rubber, to cover the erect penis. It is the most widely used contraceptive by males in India as it is cheap and easily available. It is given free also by government. It checks pregnancy by preventing deposition of semen in the vagina. Condom should be used regularly and put on before starting coital activity, otherwise sperm-containing lubricating fluid may be left in the vagina. Condom should be discarded after a single use. Condom is also a safeguard against infection of AIDS and sexual diseases.

(2) **Diaphragm and cervical cap** are dome-shaped rubber plastic covers that are fitted on the cervix in the female's vagina, and check the entry of sperms into the uterus. These must be kept fitted for at least six hours after sexual intercourse. They are smeared with a spermicidal jelly or cream each time they are used. The diapharm and cervical cap are the counterparts of condoms in the female

(3) **Intrauterine devices** (IUDs) are plastic or metal object placed in the uterus by a doctor. These include loop, copper-T, spiral, ring, bow, shield, *etc*. They prevent the fertilization of the egg or implantation of the embryo. Their presence perhaps acts as a minor irritant and this makes the egg to

move down the Fallopian tubes and uterus rather quickly before fertilization or implantation. Drawbacks of IUDs include their spontaneous expulsion, even without the woman's knowledge; occasional haemorrhage; perforation of uterus; tubal pregnancy (implantation of the embryo) in the oviduct; and chance of infection. Use of mechanical contraceptives have pregnancy rates of less than 10%.

(e) **Physiological (Oral) Devices :** Birth control pills (oral contraceptives) check ovulation by inhibiting the secretion of follicle-stimulating hormone (FSH) and luteinizing hormone (LH) that are necessary for ovulation. Hence, no eggs are released in a woman on the pill and conception cannot occur. The birth control pills have side effects such as nausea, breast tenderness, weight gain and break-through bleeding (slight blood loss between menstrual periods) and high blood pressure. On the other hand, the oral contraceptives reduce the chances of certain types of cancer to occur in their users. A combined pill is the most commonly used birth control pill. It contains synthetic progesterone and estrogen in doses high enough to check ovulation. Pill Mala D is taken daily, and the pill Saheli is taken weekly. Oral contraceptives have pregnancy rates less than 1%. Birth control pills are likely to cause cardiovascular problems.

(f) **Other Contraceptives :** Certain contraceptives, such as progestin minipill, are implanted under the skin of the upper arm. They prevent pregnancy for 3 to 4 years. They steadily release a tiny amount of progestin into the blood. Injectable one- month contraceptives are made in Germany, Maxico and China. These are marketed to many countries.

(g) **Abortion :** Abortion is the medical termination of pregnancy (MTP) before the foetus becomes viable. It is one of the most widely used methods of fertility control in world. Certain pills act as abortants. They function by inducing menstruation which checks the implantation of the zygote or detaches the implanted egg. There are movements against abortion practically all over the world. A drug named RU-486, an analogue of progesterone, developed in France terminates pregnancy within the first few weeks, It blocks the progesterone receptors in the uterus, thereby preventing progesterone from maintaining pregnancy.

(h) **Abstinence :** The best and 100% reliable way to avoid conception is to abstain from sexual intercourse. It is an unnatural mode of birth control, and seems impracticable. Some couples practice abstinence at certain times with success.

(ii) **Permanent Method :** Sterilization provides a permanent and sure birth control. It is called **vasectomy** in man and **tubectomy** in woman. It involves the removal of a short segment of each vas deferens or oviduct and tying up of the remaining ends tightly with surgical thread. The operations are minor, usually performed under local anesthesia, give very little discomfort, and do not affect the sexual life. Contrary to common belief, man with vasectomy is still capable of ejaculation, but the latter consists only of secretions of various glands, and has no sperms. sperms are still produced but reabsorbed into the body. Production of testosterone continues and its distribution does not need the ducts.

(a) **Laparoscopy :** Now a telescopic instrument called laparoscope is used in tubal ligation. This blocks the fallopian tubes. Eggs continues to be produced because the ovaries are intact, but they fail to pass into the uterus and sperms fail to reach the eggs for fertilization.

(b) **Most Effective Birth Control :** Sterilization is at present the most effective means of birth control. It is difficult to reverse.

(c) **Extent of Contraceptive Use :** According to a UN report in the Tribune dated 24.8.87, half of the world couples use contraception and one in three chooses, sterilization.

(d) **Medical Advice :** The birth control measures should be used with the guidance of qualified doctors. The government provides these facilities free at the family planning centres. Contraceptives are given free or at nominal prices at these centres to the couples of reproductive age desirous of preventing conception.

(e) **Advice for Fertility :** The couples who are not getting children can also seek advice and remedy at the family planning centres.

(f) **Abortion or Medical Termination Pregnancy (MTP) :** has now been legalised in India.

S. No	Method	Action
(1)	Rhythm method	No intercourse during woman's fertile period (day 12-20).
(2)	With drawl	Penis is withdrawn before ejaculation.
(3)	Tubectomy / Tubal ligation	Woman's fallopian tubes are cut and tied, permanently blocking sperm release.
(4)	Vasectomy	Man's vasa deferentia are cut and tied permanently blocking sperm passage.
(5)	Intrauterine device (IUD)	Small plastic or metal device placed in the uterus, prevents implantation. Some contain copper, other release hormones
(6)	Oral contraceptive	Synthetic estrogens and progesterones prevent normal menstrural cycle; primarily prevent ovulation.
(7)	Male condom	Thin rubber sheath on erect penis collects ejaculated semen.
(8)	Female condom	Plastic pouch inserted into vagina catches semen.
(9)	Diaphargm	Soft rubber cup covers entrance to uterus, prevents sperm from reaching egg and holds spermicide.
(10)	Cervical cap	Miniature diaphragm covers cervix closely, prevents sperm from reaching egg and holds spermicide.
(11)	Foams, creams, jellies, etc.	Chemical spermicides inserted in vagina before intercourse, prevent sperm from entering uterus.
(12)	Implant (Norplant)	Capsules surgically implanted under skin, slowly release hormone that blocks ovulation.
(13)	Injectable contraceptive (Depo-	Injection every 3 months of a hormone that is slowly released and prevents ovulation.

	Provera)	

15.5 Amniocentesis

(i) **Aim :** It is a technique to determine :

(a) Sex of the developing baby.

(b) Genetically controlled congenital diseases.

(c) Metabolic disorders in foetus.

So amniocentesis is a **pre-natal diagnostic technique.**

(ii) **Procedure :** It involves following steps :

(a) Location of the foetus is determined by a technique called **sonography** (using high frequency ultrasound waves) to prevent accidental damage to the foetus.

(b) A fine hollow needle is passed through the abdominal and uterine wall of a pregnant female (about 14^{th} to 15^{th} week after conception) into the amniotic cavity.

(c) A small amount of amniotic fluid is withdrawn. It contains foetal skin cells and a number of proteins, especially enzymes. The cells can be cultured *in vitro* for further examination.

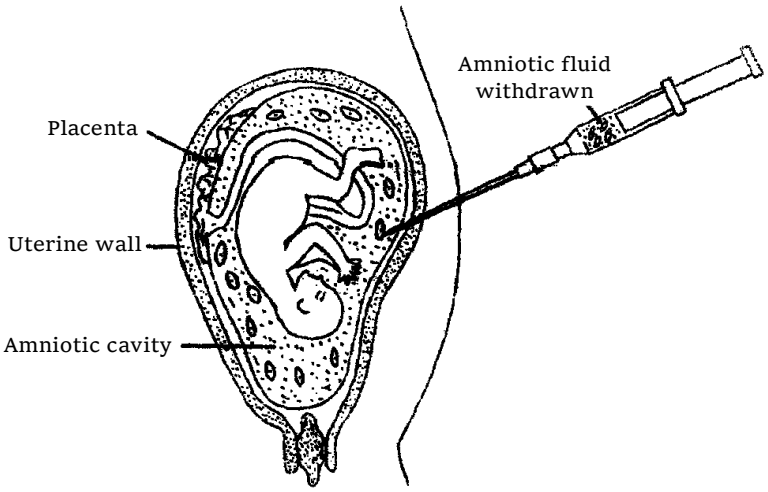


Fig : Amniocentesis

(iii) **Significance**

(a) **Sex determination :** The somatic cells of foetal skin drawn with the amniotic fluid are stained to determine the presence of sex chromatin (barr body). Presence of barr body indicates that the developing foetus in female as female is with 2 X-chromosomes out of which one X-chromosome is active, while other X-chromosome is heterochromatised into a darkly stained barr body.

(b) **Congential disease :** By Karyotypic studies of somatic cells, abnormalities due to changes in chromosome number like Down's syndrome, Turner's syndrome, Klinefelter's syndrome etc. can be determined.

(c) **Metabolic disorder :** By the enzyme analysis of amniotic fluid, different types of inborn metabolic disorders like phenylketonuria, alcaptonuria etc. can be detected. These inborn errors are caused by the absence or inactivity of specific enzymes due to gene mutations. So with the help of amniocentesis, if it is confirmed that the child is likely to suffer from some incurable, congenital defect, the mother can go for abortion.

(iv) **Drawback :** However, these days, the amniocentesis is being misused also. Mothers even get their normal foetus aborted if it is a female. This is just equivalent to killing of a normal child. So Govt. of India enforced the **Pre-natal Diagnostic Techniques (Regulation and Prevention of Misuse) Act, 1994,** since January 1, 1994 under which all genetic counselling centres and laboratories are required to apply for registration. The violation of this Act can bring a fine of Rs. 50,000 and imprisonment for two years. The doctor's registration is also cancelled till the complaint is disposed of.

(v) **Chorionic Villus Sampling (CVS) :** Amniocentesis is possible without a chance of injuring the foetus with the needle only after the sixteenth week of pregnancy. At this time, abortion is not safe. A new technique, named Chorionic Villus Sampling (CVS), can be done during the eighth to tenth week of pregnancy when abortion is safe for the woman. For CVS, cells are sucked into a catheter passed through the cervix. CVS technique provides a mass of rapidly dividing foetal cells, thus facilitating the examination of chromosomal disorders.

15.6 Test Tube Babies

The technique of *in-vitro* fertilization and *in-vitro* development followed by the embryo-transfer in the uterus of the normal female to start the development and finally leading to normal birth, is called **test tube baby.**

(i) **History :** First attempt to produce a test tube baby was made by a Italian scientist, **Dr. Petrucci** (1959 A.D.). Although, this human embryo survived for only 29 days, but his experiment opened a new filed of biological science. The first test tube baby was born to Lesley and Gilbert Brown on July 25, 1978, in Oldham, England. Mrs. Brown had obstructed Fallopian tubes. **Dr.Patiricke Steptoe** and **Dr. Robert Edward** both from England experimented on Mrs. Brown successfully. the world's first test tube baby (a baby girl) was named as **Louise Joy Brown**. Later, test tube babies were also born in Australia, United States and some other countries. India's first test tube baby was born on **3rd October, 1978 in Kolkata.** Her name was **Kanupriya Aggarwal** and was created by **Dr. Subash Mukherjee.**

(ii) **Procedure :** It involves the following steps :

(a) Removal of unfertilized ovum from reproductive tract of a female.

(b) Ovum is kept under aseptic conditions.

(c) Fusion of sperm and ovum in a culture medium, outside the female body, to form the zygote.

(d) Zygote is stimulated to develop *in vitro* upto 32-celled stage.

(e) Developing embryo is implanted on the endometrium of the uterus at 32-celled stage. So the pregnancy in the woman starts and further development of the child continues in the womb till it is born. Such a baby called a test tube baby.

(iii) **Significance**

(a) It is boon to infertile mothers.

(b) It can be used for men with Oligospermia (low sperm count).

(c) Old superior cows can donate oocytes.

Embryos can be frozen and preserved in an embryo tank for 10 years for future use.

In very rare cases, a **surrogate mother** may have to be used to bring up *in vitro* fertilized ovum to maturity. Though biological realization of a test baby is a remarkable achievement, it has raised several ethical and legal problems like the right over the child.

Important Tips

- **China** (1234 million) and **India** (953 million) are two most populous countries; **USA** (265.8 million) and **Indonesia** (200.6) come next.
- India's population growth rate is about 2% a year and China's 1.4%.
- Maximum population growth rate in the world is in **Kenya** (5.5%).
- **Austria** has shown a negative growth rate.
- The most thickly populated country of the world is **Bangladesh.**
- **Greenland** is the most thinly populated country (45/Km^2) followed by Australia.
- The International Conference of Population and Development (ICPD) was held at **Cairo** in September 1994.
- **Mumbai** will become the second largest megapolis in the world by the turn of the century with a population of 18.9 million.
- **Tokyo** is the largest city with 26.5 million people.
- The first census in India was carried out in 1891.
- In last census **Nagaland** registered the highest growth rate of 56.86% while Kerala the lowest, 13.98%.
- The most thickly populated state of India is **West Bengal** (766/Km^2); the most sparsely populated area of the country is **Arunachal Pradesh** (10 Km^2).
- The first district to become 100% literate is **Ernakulam** in Kerala.
- The first state to become 100% literate is also Kerala.
- **Chandigarh** has the lowest number of females per 1000 males with 790.
- **Bihar** stood at the bottom with a literacy rate of 38.48% with **Rajasthan** being close to it having 38.55 literacy percentage.
- **National average of infant mortality rate is 72,** where as U.P., It was 86, in Bihar 73, In Rajasthan 85 and In M.P. 89 while that of Kerala is only 15.
- Indian population is a young population, while the population of USA, England, Germany, etc. is **ageing population.**

- In china, more than 8,000 live for more than 100 years, about 8 million above 80 years, about 20 million above 70 years and about 120 millions people above the age of 60 years.
- **Population explosion :** Also called **Population holocaust.** It is high growth rate of human population.
- Nearly half of the world population is distributed in four countries : **China** (1120 million), **India** (844 million-1991 census),**USSR**(291 million) and **USA** (251 million).
- World Population Day : 11 July. (since 1987 when on 11 July on that year, the world population crossed five billion).
- In **July, 1997,** Indian population was growing at the rate of **16 million per year** which means **45,000 per day** and **31 per minute.**
- Minimal decennial growth is reported from Kerala (13.98%) while maximal decennial growth is reported from **Nagaland** (58.86%). It was due to better fertility awareness among rural women folk.
- **Indian Population Project-VI (IPP-6)** ended in March, 1997.
- According to revised estimates, if the present trend continues, **India will surpass China in 2050 A.D.** With population of 2160 million.
- China's birth rate is 18 births per 1,000 population and its TFR is 2.2 children per woman. Conversely, India's birth rate and TFR are 30.5 per 1,000 persons and 3.5 per women respectively (1991 census).
- After 40 years of age, contraceptive pills increase the chances of cardiovascular diseases.
- **Matez Gasper : World's fifth billion child,** a male infant born in **Zagreb** (Yugoslavia) on July 11,1987.
- **Fatima : World's 6^{th} billion child,** a female infant born in **Sarajevo** (Kosovo) on October 14, 1999.
- India till 1920 was in the first stage **(**high stationary**)** of demographic cycle but now India has entered third stage **(**late expanding**)** of the cycle.
- In **China,** person is considered as of "one year age" at the time of birth.
- Most natural population is an **open population** in which individuals undergo immigration or emigration, while yeast population in a test tube is a **closed population** in which individual do not undergo immigration or emigration.
- **Couple protection rate :** Bringing eligible couples under the umbrella of various modes of contraception.
- Family Planning Programme was adopted as a National Programme in 1995 A.D. Now it has been renamed as **Family Welfare Programme.**
- Government-sponsored Family Planning Programme was started in India in 1951.
- **Mirena :** A new contraceptive plastic coil coated in copper and is fitted in the uterus. Copper acts as a spermicide while coil releases small amounts of an artificial hormone, **gastrogen,** which further increase the spermicidal effect of copper. It combines both mechanical and hormonal contraceptive

methods and has been found to have more than 99% efficary. It is introduced by a German company.

- Central Drug Research Institute (Lucknow) has developed a plant-based spermicidal cream "**Consap**" from Reetha (Sapindus mukrosii).
- **NIm-76 :** It is neem-based, pre-coital vaginal contraceptive cream having spermicidal properties. It has been developed by **Defence Institute of Physiology and Allied Sciences (DIPAS), New Delhi.** It has been found to be safe, non-hormonal and non-toxic with no side effects. Nim-76 punctures the sperm skin causing leakage of cellular contents so preventing the capacitation of sperms. It also has both anti-bacterial and anti-fungal properties.
- **Contraception :** Method of birth control to check fertilization.
- **Sterilization** is the most effective method of birth control.
- **Laparoscope :** Instrument to aspirate the oocytes from the ovary for IVF (In Vitro Fertilization)
- **UN Population Award, 1992** was awarded to an Indian Industrialist, **J.R.D. Tata,** for his efforts to stabilize Indian population.
- **UN Population Award, 1998 :** It was jointly awarded to a group of **Ugandan Elders** (credited to reduce the practice of female genital mutilation) and **head of Jamacia's Family Planning Board**
- India's first test baby was "**kanpuriya Aggarwal**". India's second test tube baby was "**Kumari Harsha**" She was born on August 6, 1986.
- **Vas aplasia :** Absence of both vasa deferentia.
- **Ogino (1930) :** Described "**Safe period**" or "**Calander period**" to control pregnancy .
- Success rate of test tube baby is **less than 20%.**
- **Literacy rate : 2001** = 65.38%; **1991** = 52.11%; **1997** =62% (+10%).
- **G.I.F.T. –** Gametic Intra- Fallopian Transfer is the latest technique to produce the child.
- **Gamete-Intra Fallopian tube transfer :** Sperm (obtained by masturbation / electro ejaculation) and ovum obtained by laproscopy are injected into the mid part of the oviduct by a separate catheter in a cycling female (in proliferative stage).

ASSIGNMENT

CHARACTERISTICS OF POPULATION

Basic Level

1. Crude number of birth by a population per unit time is called
   (a) Birth rate (b) Birth rate potential (c) Ideal birth rate (d) Birth rate balance
2. Closely related, morphologically similar sympatric populations, but reproductively isolated, are designated as
   (a) Clones (b) Demes (c) Clines (d) Sibling species
3. The abundance of a species population within its habitat is called
   (a) Niche density (b) Absolute density (c) Relative density (d) Regional density
4. Which of the following is not a controlling factor of population density
   (a) Psychological factor (b) Geographical factor
   (c) Socio-economic factor (d) Demographic factor
5. Information of birth-rate, death-rate, sex ratio, age distribution of a population can be got from
   (a) Natality table (b) Mortality table (c) Age distribution table (d)Life table
6. Which of the following factors regulate human life with reference to population density
   (a) Availability of blood, housing and health facilities (b)Urbanisation
   (c) Climatic conditions (d)All the above
7. Birth rate is directly proportional to
   (a) Good food (b) Illiteracy (c) High social status (d) Age of marriage
8. The population of a place can be increased when
   (a) Emigration decreases (b)Predation increases
   (c) Reproductivity decreases (d) Immigration increases
9. Which of the following does not help in the control of population growth
   (a) Decreased birth rate (b) Increased contraceptive use
   (c) Decreased death rate (d) Increased literacy
10. The aggregate of process that determine the size and composition of any population is called
    (a) Population dispersal (b)Population dynamics
    (c)Population explosion (d)Population density
11. Scientific study of human population is
    (a) Biogeography (b) Demography
    (c) Ecology (d) Developmental biology

12. In stable population predation
(a) Is harmful (b) Is beneficial
(c) Increase the number of predators (d) Depletes the prey

13. Number of births per thousand people in the population is expressed as
(a) Growth rate (b) Crude birth rate (c) Conception rate (d) Reproduction rate

14. In a specific area, the negros, aryans, smartians and mongolians are living. They constitute
(a) A group (b) Monospecific population
(c)Polyspecific population (d) Heterogenous population

15. Distribution of population on earth is
(a) Uniform (b) Random (c) Congregative (d) Unequal

16. Population density means
(a) The number of human per unit area
(b) The number of human in a unit area at a specific time
(c) The concentration of human population at a place (d)None of the above

17. In demography we study
(a) Decrease or increase in population
(b) Ratio of different age group of males and females
(c) Distribution of population in different countries (d) All the above

18. The Scientist who propounded that population is a group of species
(a) Darwin (b) Lamarck (c) Odum (d) Clark

19. The declining phase of a population occurs when
(a) Mortality > Natality (b) Natality > Mortality
(c) Mortality = Natality (d) Natality = Mortality=0

20. The different age group in a population is classified by
(a) Reproduction age (b) Death rate (c) Age of marriage (d) Sex ratio

21. The study of human population statistically is known as
(a) Chronology (b) Demography (c) Population science (d) Sinography

22. The significance of the study of population is to know
(a) The consequences of uncontrolled population only
(b) The benefits of planned family
(c) The population growth, distribution and density (d) All the above

23. The bio-index number means
(a) Natality-Mortality (b) Natality × Mortality (c) Mortality-Natality (d) Natality/Mortality

24. "*Population is an auto-regulated system"* was said by
(a) Malthus (b) Edward (c) Lamarck (d) Darwin

25. Interbreeding population of animals is called
(a) Sub-species (b) Species (c) Community (d) Genus

26. The stationary phase of a population occurs when
(a) Natality>Mortality (b) Natality = Mortality (c) Mortality > Natality (d) Natality=0

27. Which of the following is not a part/component of population
(a) Mortality (b) Natality
(c) Biotic factors (d) Psychological factors

28. The rate at which new born individual are joining the population by reproduction is known as
(a) Natality (b) Fertility (c) Contractability (d) None of the above

29. The average population density of developing countries as compared to developed countries is
(a) Equal (b) Less (c) More (d) Changing

30. The rate of world population growth is increasing continuously. This is due to
(a) Industrialization (b) Decreased infant mortality
(c) Increased fecundity (d) Increased food supply

31. The proportion of young individuals is highest in :
(a) Stable population (b) Declining population
(c) Expanding population (d) Both stable and declining population

32. If natality and mortality of a population are nearly same it will be termed as
(a) Declining population (b)Growing population (c)Young population (d)Stable population

33. The population of an area tends to decrease by :
(a) Mortality (b) Immigration (c) Natality (d) All the above

34. The population growth is indicated by :
(a) Emigration (b) Mortality (c) Natality (d) None of the above

35. Individuals of the same species inhabiting a particular locality constitute
(a) Flora (b) Population (c) Fauna (d) Community

36. Population size is not determined by one of the following
(a) Mortality (b) Natality (c) Immigration (d) None of the above

37. One of the following is not a characteristic of large sized animals
(a) High BMR (b) Longer generation time
(c)Lower reproductive rates (d) Slower growth rates

38. One of the following is not a demographic event
(a) Growth of population (b)Birth (c) Death (d) None of the above

39. The environmental factors which influence the population are
(a) Biotic (b) Abiotic (c) Abiotic and biotic both (d) Lotic

Advance Level

40. Growth rate of population is given by

(a) $(\text{Natality} - \text{Mortality})$ (b) $(\text{Natality} - \text{Mortality})\frac{\text{Total Migration}}{\text{Total Population}} \times 1000$

(c) $(\text{Natality} - \text{Mortality})\frac{\text{Total Population}}{\text{Total Migration}} \times 1000$ (d) $(\text{Mortality} - \text{Natality})\frac{\text{Total Population}}{\text{Total Migrartion}} \times 1000$

41. Pertaining to human population if there is a decrease in competition. It would be the result of

(a) High population density (b) Explosion of population density

(c) Stable but high population density (d) Low population density

42. Density of human population is determined predominatly by

(a) Socio-cultural factors (b) Cold temperature of the environment

(c) Availability of plenty of water (d) Availability of good food

43. The formula for the calculation of population density is $D = \frac{n/a}{t}$. In this formula '*a*' represents

(a) Whole world population (b) Unit of time

(c) Population density (d) Area of the land

44. The minimum death rate of a population is called

(a) Actual death rate (b) Mortality potential (c) Population decline (d) Received mortality

45. The animal population becomes too large for its feeding source or its habitat. its members starve die but humans escape this disaster by

(a) Immigration only (b) Emigration only

(c) Transportation of food (d) Both emigration and transportation of food

46. The percentage ratio of natality over mortality is called

(a) Vital index (b) Population density

(c) Total count of individuals (d) Fertility rate

47. In a population where competition between individuals is severe, then the distribution is said to be

(a) Random (b) Uniform (c) Irregular (d) Non-random

48. Sex ratio in a species indicates the numerical relation between the number of

(a) Males and female producing gametes (b) Blacks and whites

(c) Unisexual and bisexual (d) None of the above

49. Polar, subpolar and high altitude region are most inhabitable because

(a) Temperature is very high (b) They have fast soil erosion

(c) Temperature is very low (d) Rainfall is heavy

50. Density-dependent population regulation results when

(a) Only birth rate changes in response to density

(b) Only death rate changes in response to density

(c) Both above change (d) Population density fluctuates very little

51. Population dispersion can be defined as
(a) Movement from one place to another and immigration again
(b) Spatial distribution of individuals
(c) Migration from a natal site (d) Random mixing of two population

52. Large gap between natality and mortality will result in
(a) Less old persons in relation to children (b) More old persons
(c) Low dependency ratio (d) Prosperous country

POPULATION GROWTH & GROWTH CURVE

Basic Level

53. Rapid decline in a population due to high mortality rate is
(a) Population explosion (b)Population density (c) Population crash (d) All the above

54. The process by which individuals are included into a population is known as
(a) Immigration (b) Emigration (c) Migration (d) Both (a) and (b)

55. The natural growth rate of population is checked by certain factors. These are known as
(a) Population growth control (b) Environmental resistance
(c) Natural resistance of healthy Population (d) None of the above

56. The growth of population is determined by
(a) Biotic potential only (b) Environmental resistance only
(c) Emigration only (d) Both (a) and (b)

57. The rate of natural increase in human population refers to
(a) Birth rate (b) Mortality
(c) Natality minus death rate (d)Birth rate plus death rate

58. The measure of maximum rate of reproduction under optimal conditions is known as
(a) Population growth (b) Biotic potential (c) Carrying capacity (d) None of the above

59. The environmental resistance means
(a) The environmental factors which tend to maintain homoeostasis by regulating emigration
(b) Factors imposing check on population size
(b) Resistance of a species to the environmental factors which impose a check on population size
(d) Physiological capacity of a species to resist changes in the environment

60. The term 'biotic potential ' means
(a) The rate of growth of population in an area
(b) The increase in number of human beings in a country in a single year
(c) The physiological capacity of organisms to reproduce
(d) None of the above

61. When environmental condition are favourable, then population growth curve will be
(a) Sigmoid (b) 'J' shaped (c) 'S' shaped (d) Both (a) and (c)

62. The graph in exponential growth will be
(a) Sigmoid (b) 'J' shaped (c) 'S' shaped (d) Both (a) and (c)

63. The capacity of an environment to pull on a limited number of individuals is known as
(a) Bearing capacity (b) Limited capacity
(c) Environmental resistance (d) Carrying capacity

64. The cause of zero growth of population is
(a) No individual is added (b) Natality is zero
(c) No growth (d) Additions and deletions are equal

65. When births are equal to deaths. It is called
(a) Plateau stage (b) Exponential growth stage
(c) Early growth stage (d) Acceleration stage

66. Number of death and birth in the last stage of plateau growth curve of a population will be
(a) Equal unlike of middle stage (b) Unequal with more deaths
(c) Unequal with less deaths (d) Equal like of middle stage

67. Human population growth curve of today is
(a) Of 'J' shape (b) Of 'S' shape changed from 'J' shape
(c) Of 'S' shape (d) Of parabolic shape

68. Population growth of a country depends upon
(a) Birth and death rates (b)Death rate and emigration
(c) Birth rate and emigration (d) All the above

69. Population growth rate is directly related to
(a) National production (b) National income (c) Better facilities (d) All the above

70. Exponential growth in human population was done in
(a) Lag phase (b) Log phase (c) Plateau stage (d) First stage

71. The physiological capacity of a population to produce offsprings is known as
(a) Environmental resistance (b) Carrying capacity
(c) Biotic potential (d) None of the above

72. Environmental resistance includes factor
(a) Shortage of food (b) Diseases and predation (c)Limited space (d) All the above

73. Capacity of the environment in which a species can get maximum nutrition is called
(a) Carrying capacity (b) Growth capacity (c) Population density (d) Death rate

74. The population explosion which is being witnessed today is mainly due to
(a) Better job facilities (b) Increase in agricultural production
(c) Better health care (d) Fewer wars and battles

75. Which type of curve is for the total number of living organisms in an area
(a) Sigmoid curve (b) 'J' curve
(c) Super survival curve (d)None of the above

76. The standard of living is very badly affected by
(a) Pollution (b) Housing problem (c) Population growth rate (d)Both (a) and (b)

77. The principles of population dynamics applies to-
(a) Human beings only (b) Animals only
(c) Plants only (d) All organisms including human beings

78. Thickly populated cities are usually situated on the bank of a river because-
(a) Soil is fertile (b) Fertile soil and regular water supply
(c) Fresh water is available in plenty (d) Old civilization

79. A population is-
(a) Higher states than species
(b) Subordinate to a species
(c) Subordinate to a species as a unit of cooperative aggregation of individuals
(d) Not related to species, both are seperate

80. Zero population growth means-
(a) No immigration (b) No emigration
(c) No new births (d) Number of births and deaths equal

81. Declining population will have-
(a) More retired people (b) More office going people
(c)More college going students (d) More school going children

82. Number of young individual is more in-
(a) Declining population (b)Young population (c) Fluctuating population (d)Stable population

83. What is the most important factor for the success of animal population?
(a) Natality (b) Unlimited food (c) Adaptability (d) Interspecific activity

84. Population growth is reduced by the environmental resistance. This phase is
(a) Steady phase (b) Exponential phase (c) Lag phase (d) All the above

85. Happiness, health and prosperity of the population of a place depends upon
(a) Environment (b) High birth rate (c) Social status (d) Availability of work

86. In a population curve, the rate of growth becomes steady towards the end of exponential curve due to-
(a) Reproductive power is reduced (b) Environmental stress
(c) Migration (d) All the above

87. Exponential growth in a given population of a microorganism is limited by
(a) Competition for food (b)Accumulation of waste matter
(c) Both (a) and (b) (d)None of the above

88. Most of the invertebrates and plant populations have

(a) Less biotic potential (b) More biotic potential

(c) High mortality rate in the younger stages (d) Both (b) and (c)

89. In any growing population the most contribution is of

(a) Postreproductive members (b) Reproductive members

(c) Pre-reproductive members (d) All the above

90. Sigmoid curve represents

(a) Slow initial phase, rapid growth in logarithmic phase and steady final stage

(b) Rapid growth in initial phase, slow in second and steady in the last stage

(c) No growth initially as well as in final stage but rapid in lag phase

(d) None of the above

91. When a population is undergoing exponential growth it

(a) Remain the same size each year (b) Decreases by the same amount each year

(c) Increase by large amount each year (d) None of the above

92. After exponential increase, population growth declines and stagnates. The growth curve is

(a) S-shaped (b) J-shaped (c) Straight line (d) Circular

Advance Level

93. Two opposite forces operate in the growth and development of every population. One of them related to the ability to reproduce at a given rate. The force opposite to it is called

(a) Biotic control (b) Mortality

(c) Fecundity (d) Environmental resistances

94. *J*- shaped growth curve has

(a) Lag and exponential phases (b) Lag and stationary phases

(c) Exponential and stationary phases (d) Lag, exponential and stationary phases

95. When there is an exponential growth in a population, then it will be called as

(a) Carrying capacity (b) Log stage

(c) Negative acceleration phase (d) Positive acceleration phase

96. During the lag phase of population growth curve there was very less growth due to

(a) High birth and death rate (b) Low birth and death rate

(c) High birth and low death rate (d) Low birth and high death rate

97. Slow growth was due to high birth and high death rate which was at the time of stage of

(a) Agriculture and lower economic status (b) Agriculture and medium economic status

(c) Partial industrialised status (d) Undeveloped ancient economic status

98. A force which acts against the achievement of highest possible level to population growth is known as

(a) Population pressure (b) Saturation level

(c) Carrying capacity (d) Environmental resistance

99. When the persons die in old age after completing its life span, the survivalship curve is

(a) J-shaped (b) Concave (c) S-shaped (d) Convex

100. If the rate of addition of new members increases with respect to the individual host of the same population, then the graph obtained has

(a) Declined growth (b) Exponential growth

(c) Zero population growth (d)None of the above

101. The carrying capacity of an environment is represented by

(a) S (b) K (c) J (d) C

102. Carrying capacity of earth is

(a) 5000 millions (b) 50,000 millions (c) 5,00,000 millions (d) 50,00,000 millions

103. Which type of curve will be for the coming century

(a) Circular (b) Parabolic (c) Triangular (d) Trapezium

104. Carrying capacity is defined as

(a) The maximum number of the offsprings which an organism can produce during its fertile period

(b) The maximum number of individuals of species which can be sustained in a particular environment

(c) The rate at which new individuals arrive in a population

(d) Emigration rate of a population

105. Hereditary diseases constitute an important factor in checking the growth of population of a small community if

(a) They marry only within the community

(b) They encourage marriage outside the community

(c) They adopt birth control measures (d) They do not adopt birth control measures

106. Generally the relationship between population growth rate and

(a) Level of industrial development and education of people is inversely related

(b) Level of industrial development and education of people is directly related

(c) Level of industrial development and education of people is not related

(d) Level of industrial development is not related but related with educational development

107. Which of the following is most convincing reason for increasing population growth in a country

(a) High birth rate (b) Low mortality rate

(c) Low population of old people (d) High population of young children

108. In order for the human population to achieve zero population growth which of the following must occur

(a) There must be more postreproductive individual than reproductive individuals

(b) There must be more prereproductive than reproductive individuals

(c) There must be the same number or fewer prereproductive individuals as there are reproductive individuals

(d) All the above

109. The best way to reduce the population of undesirable species is

(a) Reduce the carrying capacity of the environment for that species

(b) Elimination of females

(c) Elimination of the young generation

(d) None of the above

110. A force which checks the achivement of the highest possible level of population of world growth is

(a) Population pressure (b) Saturation level (c) Immigration (d) None of the above

111. In a population if number of immigrated people are more than number of emigrated and death of people is low then in growth curve the phase is

(a) Decline phase (b) Exponential phase (c) Steady phase (d) None of the above

112. A population has more than 50% in postreproductive age group; according to you such population is

(a) Stable (b) Declining

(c) Increasing (d) Showing biotic potential

POPULATION TRENDS IN THE WORLD AND INDIA

Basic Level

113. The most densely populated city in India is

(a) Calcutta (b) Delhi (c) Bombay (d) Bangalore

114. First population count in India was started in

(a) 1852 (b) 1891 (c) 1901 (d) 1951

115. Generally there was population growth rate increase in India, but in which of the following year there was decrease in population growth rate

(a) 1921 (b) 1941 (c) 1951 (d) 1971

116. According to the population (census-2001) of different states of India, Madhya Pradesh is placed at which position

(a) Fourth (b) Fifth (c) Sixth (d) Seventh

117. Human population after 17th century A.D. is thought to be in

(a) Lag phase (b) Exponential phase (c) Stationary phase (d) None of the above

118. The impact of human population is directly related to

(a) Standard of living (b) Food supply and housing

(c)Health and medical care (d)All the above

119. Explosion of population in India is due to

(a) Climate (b) Limited education (c) Increased natality (d) All the above

120. Average ratio of men and women in human population is

(a) 2 : 3 (b) 1: 1 (c) 3 : 4 (d) 1 : 4

121. The term population explosion means

(a) Migration of human population from one place to another

(b) Tremendous rate of growth in human population

(c) Both (a) and (b) (d) Neither (a) nor (b)

122. Which of the following means of reducing birth rate is not legitimate in India

(a) Deprivation of the expectant mother from fundamental rights

(b) Medical termination of pregnancy

(c) Use of contraceptives

(d) Ban on marriages

123. To which population category India belongs

(a) High birth rate and high mortality rate (b) Low birth rate and low mortality rate

(c) Low birth and high mortality rate (d) High birth rate and low mortality rate

124. According to 1991 census, the population density of Madhya Pradesh is

(a) 159 persons/*sq. km* (b) 168 persons/*sq. km* (c) 149 persons/*sq. km* (d) 126 persons/*sq. km*

125. The best solution to population problem in India is to

(a) Conserve natural resources (b) Increase medical facilities

(c) Reduce the birth rate (d) Increase food production

126. According to 1991 census, the number of females per 1000 males is

(a) 941 (b) 932 (c) 936 (d) 929

127. According to population every.....person of the world is an Indian

(a) Fifth (b) Sixth (c) Seventh (d) Eight

128. Which of the following state has the highest population density

(a) West Bengal (b) Madhya Pradesh (c) Nagaland (d) Maharashtra

129. According to the demographic cycle, India is in the phase of

(a) Slow population growth

(b)Stationary population of first phase

(c) Mortality decreasing but natality high and stable

(d)Mortality decreasing and natality has started decreasing

130. In India, if the marriage age is changed to 21 years then

(a) Population growth rate will be unaffected (b) Population growth rate will decrease

(c) Population growth rate will increase (d) None of the above

131. As a country becomes industrialised its population growth

(a) Gradually increases (b) Gradually decreases (c) Rapidly comes down (d)Becomes stable

132. According to population of world, India is placed at

(a) First (b) Second (c) Third (d) Fourth

133. According to 1991 census, the maximum percent of population is increase in the state

(a) Assam (b) Punjab (c) Nagaland (d) Goa

134. According to 1991 census, the minimum percent of population increase is in the state

(a) Kerala (b) Tamilnadu (c) West Bengal (d) Madhya Pradesh

135. Which one of the following factors has contributed most in the rapid rise of human population in the present century

(a) Increase in birth rate (b) Decrease in death rate of old people

(c) Decrease in infantile mortality (d) Polygamy

136. The percentage of population of India living in M.P. at present is

(a) 7.60% (b) 7.84% (c) 7.67% (d) 7.77%

137. Who was the first scientist to estimate the human population?

(a) Darwin (b) Malthus (c) Garrod (d) Vavilor

138. The concept that "*Population tends to increase geometrically while food supply increase arithmetically"* was put forward by

(a) Thomas Malthus (b) Adam Smith (c) Stuart Mill (d) Charles Darwin

139. The population density is highest in

(a) USA (b) India (c) China (d) Japan

140. The population of India at the time of Christ was approximately

(a) 10-14 crores (b) 2-3 lakhs (c) 2-3 million (d) 10-15 lakhs

141. The population growth of India from 1981 to 1991 is

(a) 24.75% (b) 23.41% (c) 23.75% (d) 24.41%

142. According to 1991 census, rural population of India is

(a) 70% (b) 76% (c) 41% (d) 57%

143. For better survival of the human population which of the following steps is most important

(a) Reduction in the use of various resources (b) Afforestation

(c) Conservation of wild life (d) Ban on mining activity

144. Population density of India is

(a) 215 /*sq.km* (b) 200 /*sq.km* (c) 400 /*sq.km* (d) None of the above

145. Higher human population in cities is mainly due to

(a) Lot of opportunity for education (b) Availability of clean drinking water

(c) Better sanitation (d) Higher income resources

146. Most literate state of India is

(a) Kerala (b) Goa (c) U.P. (d) Sikkim

147. The present population of world is about
(a) 500 million (b) 100 million (c) 15 trillion (d) 6 billion

148. High growth at the time of exponential phase of human population growth curve is due to
(a) High birth and death rates (b) High birth and low death rate
(c) Low birth and high death rate (d) Low birth and death rates

149. What percentage of the world population lives in India
(a) 14.8% (b) 16.2% (c) 21.2% (d) 21.4%

150. Per year growth in India's population according to 1991 census is
(a) 2.22% (b) 2.23% (c) 2.11% (d) 2.13%

151. Population of India in early 21st century may be
(a) 105 crore (b) 125 crore (c) 95 crore (d) 155 crore

152. July 11 is observed as
(a) World population day (b)No tobacco day (c) World environment day (d)World health day

153. Ratio of birth and death rates according to 1991 census is
(a) 29 : 12 **(b)** 33 : 14 (c) 36 : 15 (d) 37 : 9

154. Number of females is more than males in
(a) Gujrat (b) Orissa (c) Tamilnadu (d) Kerala

155. There is a continuous increase in the growth rate (population) of the world. It is due to
(a) Increase in the fertility (b) Supply of more food
(c) Industrialization (d) Decrease in the death of children

156. Developing country having high death rate is
(a) India (b) Bangladesh (c) Pakistan (d) Nepal

157. Housing problems, health problems, pollution problems etc. are created by the
(a) Low working capacities of person's (b) Non-availability of national resources
(c) Higher population growth rate (d) Both (a) and (b)

158. The primary cause behind rapidly growing population of the world in recent times is
(a) Improvement in the standard of living (b) Decrease in death rate
(c) Increase in birth rate (d) Heating of earth

159. Main factor increasing the population is
(a) More reproductive capacity (b) Early marriage
(c) Higher natality and lower mortality (d) Suitable and favorable environment

160. Which one of the following is not the consequences of the population explosion
(a) Unemployment and poverty (b) Pollution and housing problem
(c) Low natality and high mortality (d) Scarcity of food available

161. The socio-religious cause of growth in population is
(a) Early marriage only (b)Non-adoption of family planning methods only
(c) Desire to have male heir only (d)All the above

162. The total national income is divided by the total population of the country, then it is known as

(a) Per capita income (b) Population income

(c) Per capita production (d) Per capita gross income

163. Highest and lowest population in India is in

(a) M.P. and Tripura (b) U.P. and Sikkim

(c) Maharashtra and Nagaland (d) Andhra Pradesh and Assam

164. Main cause of population explosion in the world is

(a) Excellent job facilities (b) Increase in agricultural production

(c) Excellent health care (d) Fewer battles and wars

165. Accumulation of national resources and saving is known as

(a) Society betterment (b) National saving (c) National production (d) Both (a) and (c)

166. "In the absence of environmental resistance the population grows in geometrical ratio when the food is given in arithmetical ratio". This is

(a) Kenze theory of population (b) Malthus theory of human population

(c) Kenze theory modified by Malthus (d) None of the above

167. National economic production is expressed to be

(a) Gross national development (b) National income

(c) National prosperity (d) None of the above

168. Cause of decline of population in 1927 was

(a) First world war (b) Flood (c) Lack of food (d) Second world war

169. The rapid growth of human population would lead to

(a) Shortage of space (b) Decline of resources

(c) Poverty and increases in social crimes (d) All the above

170. Famous essay on population was written by

(a) Charles Darwin (b) Thomas Malthus (c) Dr. Man Mohan Singh (d)Hugo de Vries

171. How many persons are added to the Indian population per year

(a) 13.6 million (b) 36 million (c) 80 million (d) 137 million

172. Interval between two successive census in India is

(a) 1 year (b) 5 year (c) 10 year (d) 12 year

173. The population growth rate is more stable in developed countries because

(a) Birth rate is very low

(b) Death rate is very low

(c) Both the birth rate and death rate are low

(d) Both the birth rate and death rate are high so population growth rate is stable

174. Population explosion has occurred in the last

(a) 500 years (b) 300 years (c) 100 years (d) 50 years

175. The theory of Malthus on population

(a) Fully applies to human population as it does to other organisms

(b Only applies to the wild animals

(c) Partly applies to man

(d) Does not stand true for human population

176. Better production, machinery, housing, clothing, education of labourers, working skill etc. represent the national

(a) Higher production (b) Better living standard (c) Higher Income (d) Both (a) and (c)

177. In some tribes, the population does not grow appreciably because of

(a) Low facundity (b) High rate of infant mortality

(c) Illiteracy (d) Limited food supply

178. According to 1991 census, urban population of India was about :

(a) 30% (b) 24% (c) 57% (d) 34%

179. The world's problem No. 1 today is :

(a) Population explosion (b)Pollution

(c) Nuclear proliferation (d)Natural calamities

180. The main factor for the growth of human population in India is :

(a) High birth rate (b) Less death rate (c) Lack of education (d) All the above

181. Very dense population of Indo-Gangetic plain is due to :

(a) Availability of adequate river water (b) Fertile alluvial soil

(c) Both of these (d) Presence of large cities

182. Recently the human population has grown almost exponentially becoming about 6 billion because of

(a) Recent agricultural revolution (b)Industrial revolution

(c) Major scientific and medical advances reducing mortality rate (d)All the above

183. The international conference of population and Development (ICPD) was held in 1994 at

(a) Paris (b) Brasilia (c) Cairo (d) Jerusalem

Advance Level

184. The centre of **WHO** is at

(a) Geneva (b) Paris (c) Delhi (d) New York

185. The decreasing sequence of most populated first three cities of M.P. according to 1991census are

(a) Indore, Jabalpur, Bhopal (b) Indore, Bhopal, Jabalpur

(c) Bhopal, Indore, Jabalpur (d) Indore, Jabalpur, Gwalior

186. In India the number of females per thousands males had been constantly decreasing but in which of the following years, the number had been increased

(a) 1971-1981 (b) 1981-1991 (c) 1951-1961 (d) 1961-1971

187. The 20th century has witnessed a remarkable increase in the population of the world and specially so in India. One major factor for this is that

(a) Older people have began to live longer (b) More children are born in each family

(c) More children per family began to reach the reproductive age

(d) More people are marrying in younger age group

188. The least densely populated state of India is

(a) Kerala (b) Sikkim (c) Arunachal Pradesh (d) Jammu and Kashmir

189. Appropriate and better investment is essential for the direct

(a) Solution of problem of the world (b)Solution of the personnel problems

(c) Development of the country (d)All the above

190. The long term planning for human civilization is

(a) Increase in food production (b) Colonisation of rarely populated area

(c) Control of human diseases (d) None of the above

191. In India, human population is heavily weighted towards the younger age groups as result of

(a) Long life-span of many individuals and low birth rate

(b) Short life-span of many individuals and of a high birth rate

(c) Long life-span of many individuals and of a high birth rate

(d) Short life-span and low birth rate

192. According to which theory will be the human population out-run food supply

(a) Altrusian theory (b) Malthusian theory (c) Eltons theory (d) Kalthsian theory

193. Population surge 230 years ago was due to

(a) Industrial revolution (b) Agriculture revolution

(c) Cultural revolution (d) Intellectual revolution

194. In the population of world, how many persons are added per year

(a) 4.11 crores (b) 5.5 crores (c) 8 crores (d) 10 crores

195. In the population curve of India, nowadays the number of

(a) N=M (b) M<N

(c) M>N (d) Deaths and births both are more

196. Rate of human population growth is

(a) Directly proportional to good weather

(b) Directly proportional to industrial development

(c) Inversely proportional to education (d) Directly proportional to the use of drugs

197. The minimum number of females per 1000 males are found in

(a) Sikkim (b) Goa (c) Andaman (d) Arunachal Pradesh

198. Exponential phase of human growth started about

(a) 1 A.D. (b) 1600 A.D. (c) 1750 A.D. (d) 1975 A.D.

199. Average population density on earth is

(a) 6 persons/sq. km (b) 26 persons/sq. km (c) 10 persons/sq. km (d) 40 persons/sq. km

200. In which one of the following the birth rate is high & death rate is normal

(a) India and Morocco (b) America and Spain (c) Sweden (d) Indonesia

201. The population growth rate is maximum in

(a) Singapore (b) India (c) Pakistan (d) Bangladesh

202. The Netherlands is a small country still it has a high population. Reason you conclude is, can be

(a) All places are equally inhabitable (b) Low death rate

(c) High birth rate (d) Environmental condition are very favourable

203. Total population of the world till the end of 20th century will become

(a) 5×10^9 (b) 5.35×10^9 (c) 7.5×10^9 (d) 6×10^9

204. Presently, the world population doubles after every

(a) 15 years (b) 20 years (c) 30 years (d) 35 years

205. According to Thomas Robert Malthus population and quantity of food increases respectively

(a) Geometrically, algebraically (b) Algebraically, geometrically

(c) Both algebraically (d) Both geometrically

206. Indicate the completely correct statement about human races

(a) Different human races cannot interbreed

(b) Some human races can interbreed

(c) All human races can interbreed and produce fertile offspring

(d) All human races can interbreed but most will produce infertile young ones

207. Human population growth in India

(a) Tends to reach a zero population growth as in case of some animal species

(b) Can be reduced by permitting natural calamities and enforcing birth control measure

(c) Tends to follow a sigmoid curves as in case of many other animal species

(d) Can be regulated by following the national programme of family planning

208. According the population density of different states of India, Madhya Pradesh is placed at

(a) Fourth (b) Fifth (c) Seventh (d) Fifteenth

209. Malthus wrote an essay on population in-

(a) 1701 (b) 1760 (c) 1778 (d) 1809

210. The human population is increasing at an enormous rate. But the rate of growth is not uniform in all countries and among different groups of society-

(a) Above statement is not correct

(b) Above statement is correct and population growth is more in undeveloped countries and in less developed groups of society

(c) Above statement is correct and population growth is more in developed countries and developed societies

(d) Above statement is partialy correct and partialy not correct

211. Number of death and birth in the last stage of growth curve of a population will be
(a) Equal unlike of middle stage (b) Unequal with more deaths
(c) Unequal with less deaths (d) Equal like of middle stage

212. Slow growth was due to high birth and high death rate which was at the time of stage of
(a) Agriculture and lower economic status (b) Agriculture and medium economic status
(c) Partial industrialised status (d) Undeveloped ancient economic status

213. In 1900 A.D. the world population was
(a) 1.5 billions (b) 2 billions (c) 1.7 billions (d) 900 millions

214. Average population of the world is .....per kilometer
(a) 72 persons (b) 27 persons (c) 127 persons (d) 172 persons

215. Average annual growth rate per 1,000 individuals in developing countries is :
(a) 10 (b) 25 (c) 36 (d) 46

216. One of the following developing country shows highest death rate due to natural calamities
(a) India (b) Bangladesh (c) Pakistan (d) Nepal

217. The human population can be truely called civilized in a large measure on
(a) Their ability of humanity to moderate its fecundity
(b) In increasing the food population
(c) Colonization of under populated areas (d) Combating human diseases

BIRTH CONTROL , TEST TUBE BABY & AMNIOCENTESIS

Basic Level

218. The success of birth control programmes in controlling population growth is dependent on
(a) Use of contraceptives (b) Tubectomy
(c) Vasectomy (d) Acceptability of the above by the people

219. In amniocentesis, the fluid is taken from
(a) Foetal blood (b) Mother's blood
(c) Body fluid of mother (d)Fluid surrounding foetus

220. What is the function of copper-T
(a) Checks mutation (b) Stops fertilization
(c) Stops zygote formation (d) Stops oblituation of blastocoel

221. Oral contraceptives are the different combination of
(a) Estrogen and testosterone (b) Estrogen and progesterone
(c) Progesterone and testosterone (d)Estrogen and LH

222. The mechanical measure of population control includes
(a) Condom only (b) Diaphragm only (c) IUD only (d) All the above

223. The Chemical method of-contraception includes

(a) Jellies only (b) Creams and foams only

(c)Oral contraceptive only (d) All the above

224. Test tube baby means a baby born when

(a) It develops from a non-fertilized egg

(b) It developed in a test tube

(b) It is developed through tissue culture method

(d) The ovum is fertilised externally and there after implanted in the uterus

225. Action of contraceptive is

(a) Prevent the ovulation only

(b)Prevention of ovulation and fertilization only

(c) Prevention of ovulation, fertilization and implantation only

(d) Prevent the rapid passing of eggs in oviduct

226. Amniocentesis is a process to

(a) Determine any disease in heart

(b)Determine any hereditary disease in the embryo

(c) Know about the disease of brain (d) All the above

227. Which one of the following is tested by the technique of amniocentesis

(a) Biochemical abnormalities in the foetus (b) Errors of metabolism in the foetus

(c) Chromosomal abnormalities in the foetus (d) All the above

228. Surgical removal or cutting and ligation of the ends of oviduct is known as

(a) Tubectomy (b) Oviductomy (c) Vasectomy (d) Ovarioctomy

229. The most important component of the oral contraceptive pills is

(a) Progesterone (b) Growth hormone

(c) Thyroxin (d) Luteinizing hormone

230. Through amniocentesis foetal cells can be cultured and tested for detecting various diseases of foetus by

(a) Karyotype (b) Enzyme production (c) DNA analysis (d) All the above

231. What is the purpose of tubectomy

(a) To prevent embryonic development (b) To prevent sexual intercourse

(c) To prevent formation of eggs (d) To prevent fertilization

232. Removal of a segment surgically and ligation of cut ends of vas deferens is known as

(a) Tubectomy (b) Vasectomy (c) Gonadectomy (d) Castration

233. Action of vaginal diaphragm is

(a) Prevent the ova to come in the uterus

(b) Prevent the sperm of come in contact with ova

(c) Spermicidal (d) Anti-implantational

234. Surgical removal of testes is known as

(a) Testectomy (b) Gonadectomy (c) Castration (d) None of the above

235. Foetal sex can be determined by examining cells from the amniotic fluid by looking for

(a) Barr bodies (b) Autosomes (c) Chiasmata (d) Kinetochore

236. Amniocentesis is the withdrawl of amniotic fluid in

(a) Menopause (b) Lactation (c) Gestation (d) Pregnancy

237. Trade name of weekly oral contraceptive pill is

(a) Mala (b) Saheli (c) Mala A (d) Mala D

238. A serious draw back of amniocentesis is that

(a) It often provides wrong information

(b) It occasionally causes injury to the foetus

(c) It is misused to bring about termination of even normal female foetus at large scale

(d) All the above

239. Safe period for intercourse is

(a) One week after menses (b)One week before menses

(c) One week before menses and one week after menses (d)10-15 after menses

240. Progesterone in the contraceptive pill

(a) Prevent ovulation (b) Inhibits estrogen

(c) Check attachment of zygote to endometrium (d) All the above

241. The birth control device not used by women is

(a) Diaphragm (b) Oral pill (c) Condom (d) Copper T

242. In India, marriageable age for females as :

(a) 15 years (b) 18 years (c) 20 years (d) 21 years

243. The best way to decrease population of a country is :

(a) To educate the people (b) To have better living condition

(c)Mass killing (d) To practise/family planning technique

244. Government-sponsored "Family planning programme" started in

(a) 1947 (b) 1950 (c) 1951 (d) 1955

245. Fertilization of ovum may be prevented by :

(a) Tubal ligation (b) Vasectomy (c) Use of IUCD (d) All the above

246. Intrauterine devices IUDs are used to prevent :

(a) Sperm to reach ovum (b)Sperm to reach female (c)Sperm from living (d)All the above

Advance Level

247. Test tube babies are produced by

(a) Fertilising the egg removed from the body of the female with the husband's sperm outside in *vitro* culture. The zygote is transferred back

(b) External fertilisation and development *in vitro* culture till 32 cells stage before putting the embryo back into mother's uterus

(c) Complete development of a baby in *vitro*

(d) Development upto 32 cells stage and transplanting embryo in the uterus of a surrogate mother

248. MTP means

(a) Many transferable pregnancies (b) Medically temporary pregnancy

(c) Medical termination of pregnancy (d) Multiple temporary pregnancy

249. Action of jelly and cream is

(a) Spermicidal and immovalizing the sperms also (b)Entangles the sperms

(c) Preventing the ova to be released

(d) Enables the sperms to reach towards ovum speedly

250. At what stage the embryo is implanted in the uterus

(a) Immediate after fertilization (b) After 16 cells stage

(c) After 64 cells stage (d) After 32 cells stage

251. The latest technique to produce the child is GIFT. The full form is

(a) Gametic internal fertilization and transfer (b) Gametic intra-fallopian transfer

(c) Gametic internal fallopian transplant (d) General internal fallopian transfer

252. Legally acceptable term of abortion is

(a) MTP (b) MMTP (c) MTTP (d) None of the above

253. Which of the following is a method for birth control

(a) IUDs (b) GIFT (c) HTF (d) IVE-ET

254. Daily oral contraceptive pill is

(a) Mala C (b) Mala N and Mala D (c) Mala A (d) Mala D

255. Laparoscope means

(a) Removal of ovary (b) Removal of a part of oviduct

(c) Tubular ligation (d) Fitting copper T

256. In GIFT the transfer of .....by a separate catheter in the .....is done by using the laproscope

(a) Fertilized ova, fallopian tube (b) Unfertilized ova, fallopian tube

(c) Sperm and ova, fallopian tube (d) Sperm, fallopian tube

257. Which mechanical device to control child birth is fitted on the cervix

(a) Diaphragm (b) Condom (c) Loop (d) Copper T

258. Pre-natal defects in the foetus can be detected by :

(a) Laparoscopy (b) Chorion villus sampling (c)Genetic engineering (d) Endoscopy

259. Amniocentesis has helped :

(a) The childless couple

(b) Antifemale demographic snowball set in motion

(c) Biological superiority of female established (d) Waste of money

260. An IUCDs is :

(a) Condom (b) Contraceptive pill (c) Copper-T (d) All the above

261. Which of the following is involved in test-tube baby production?

(a) Laparoscopy (b) Cathetar (c) *In vitro* fertilization (d) All the above

262. Saheli, a female antifertility pill is used

(a) Daily (b) Weekly (c) Quarterly (d) Monthly

ANSWER

ASSIGNMENT (BASIC & ADVANCE LEVEL)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
a	d	a	a	d	d	b	d	c	b	b	d	b	d	c	b	d	d	a	a
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
b	d	d	b	b	b	d	a	c	b	c	d	a	c	b	d	a	d	c	b
41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
d	d	d	b	d	a	b	d	c	c	b	b	c	a	b	d	c	b	b	c
61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
b	b	d	d	a	a	c	d	d	b	c	d	a	c	a	c	d	b	c	d
81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
a	b	c	a	a	b	c	d	b	a	c	a	d	a	b	a	a	d	d	b
101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
b	b	b	b	a	a	d	c	a	d	b	b	c	b	a	d	b	d	d	b
121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140
b	a	d	c	c	d	b	a	c	b	b	b	c	a	c	b	b	a	d	a
141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160
b	b	c	d	d	a	d	b	b	b	a	a	b	d	d	c	c	b	c	c
161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180
d	a	b	c	b	b	b	c	d	b	a	c	c	c	a	b	b	b	a	d
181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200
c	d	c	a	b	a	d	c	c	b	b	b	a	c	b	c	c	c	b	a
201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220
c	d	c	d	a	c	c	d	c	b	a	a	c	b	b	b	a	d	d	b
221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240
b	d	d	d	c	b	d	a	a	a	d	b	b	c	a	d	b	c	c	a
241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260
c	b	d	c	d	a	b	c	a	d	b	a	a	b	c	c	a	b	b	c
261	262																		
d	b																		

***