Reproduction

Introduction

Reproduction is the ability of living organisms to produce new living organisms similar to them. It is one of the important characteristic of life. Reproduction is aimed at multiplication and perpetuation (stability) of the species. In other words it provides group immortality be replacing dead individuals with new ones. Reproduction is necessary for the continuation of species in nature.

- Types of Reproduction: There are two types of reproduction asexual and sexual reproduction.

(i) Asexual Reproduction: The production of a new organism from a single parent without the involvement of sex cell (or gametes) is called asexual reproduction. There are different types of asexual reproduction.

- Binary fission: In which a single organism divides to produce two daughter organisms of equal size.
- E.g. such as amoeba, paramecium, etc.

- Budding: Formation of a daughter individual from a small projection which is called as but, arising on the parent body is called as budding.
- E.g. such as yeast & hydra.

- Spore formation. A spore is a microscopic cell which contains a nucleus with a small mass of cytoplasm surrounded by a protective coat. A spore develops into a new individual. Fungi such as mucor and rhizopus reproduce asexually by spore formation.
- Regeneration: Ability to make up the lost part is called regeneration as in spirogyra. Planaria and hydra.

- Vegetative propagation: In which the vegetative part of the plants (stem, root, leaves) develop into a new plant. When new plants develop from these parts, either naturally or artificially, the reproduction is called vegetative propagation.

- E.g. The roots of sweet potato & leaves of bryophyllum.

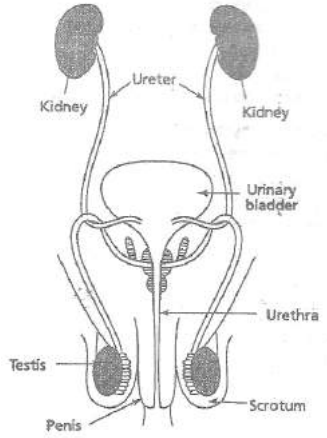
(ii) Sexual Reproduction: Production of offsprings by formation and fusion of special haploid cells called as gametes. These are contributed generally by two parents i.e. male gamete and female gamete is called as sexual reproduction. This type of reproduction is commonly in higher plants and animals.

- Reproduction in human: All human beings reproduce sexually. Sexual reproduction takes place with the help of reproductive or sex organs. The various stages in the reproductive process include:
- Formation of gametes (sex cells).

- Periodic changes in the female body to prepare for pregnancy

- Fertilization (fusion of male and female gametes)
- Pregnancy and birth

- Male Reproductive system: This system is concemed with spem formation. It is formed of following organs:
  (i) Testes: One pair, oval and pinkish structures which are primary sex organs as formation of sperm occurs in them.
- Testes are present in thin walled scrotal sacs as here temperature is 2^0C lower than body temperature.
- Inside testes seminiferous are present which give rise to sperms. Millions of sperms are produced by the testes. Sperms are very small in size, each has a head, a middle piece and a tail. Sperm is single cell structure.
  (ii) Epididymis: This is an elongated. Flattened structure formed of six meter long highly coiled tube.
  (iii) Vasa deferentia: It is a long (about 30cm.) narrow, muscular tube which meets with ejaculatory duct of seminal vesicle (forms 60% semen), prostrate gland with urinary duct to form urinogenital canal.
  (iv) Penis: It is a cylindrical, erectile and copulatory organ, which forms the external genitalia of male. It is the copulatory organ of males.



Male reproductive system

- Female reproductive system: It includes the following organs:

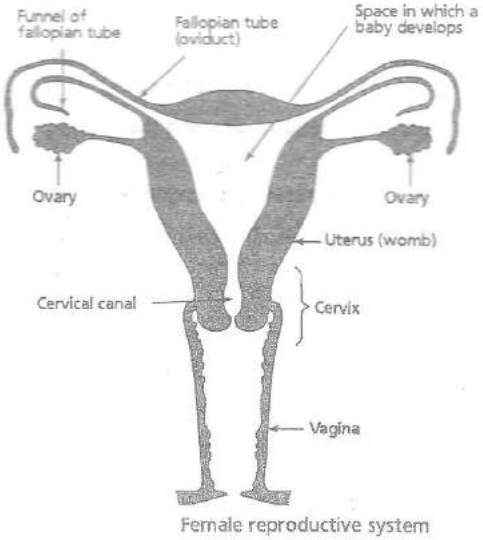
(i) Ovaries: These are one pair, Small, primary female sex organs, Involved in formation of ovum.

(ii) Fallopian tubes: These are one pair long (about 12 cm.) tubes, ciliated and muscular. It conducts ovum from ovary to uterus.

(iii) Uterus: It is a large, hollow, Muscular, pear shaped organ. It is the site of foetal growth during pregnancy and takes part in placenta formation. It has a broad mian body and a narrow cervix.

(iv) Vagina: It is a long (about 7.5cm) muscular tube extends backward in front of rectum from cervix to vestibule. It acts as a copulation canal and birth canal.

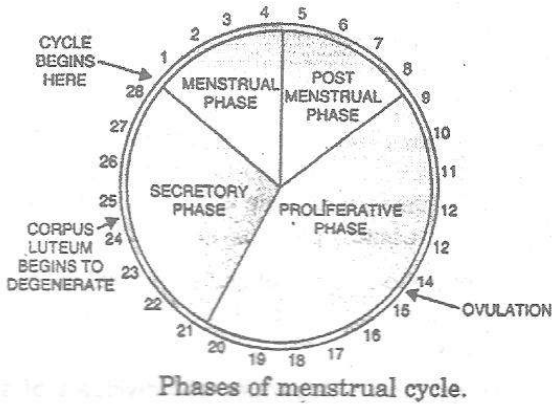
(v) Vulva: It forms the external genitalia of females.



Female reproductive system

- Fertilization: After the sperms are introduced inside the female body. The nucleus of the sperms fuse with the egg nucleus to form a zygote. This process is known as fertilization. After the zygote is formed, it passes down the oviduct to the uterus, where it fixes itself firmly onto the uterine wall to form the embryo. The embryo developed into a fully grown baby before it comes out from the female body. Birth of the child marks the end of the reproductive process.
- Functions of sex hormones: Sex hormones of female are estrogens and progesterone, While testosterone is sex hormone of male.
- Control the growth and functioning of secondary sex organs of male (e.g. epididymis, vasa deferentia, prostate, penis, etc.) and female (e.g. fallopian tubes, uterus, vagina etc.).
- Control the development of secondary sexual characters which help in sexual dimorphism.
- Significance of sexual Reproduction: It produces new combinations of genes during crossing over and chance distribution of chromosomes during gametogenesis by meiosis; and chance fusion of gametes during fertilization.It introduces variations in the population which increases the chances of adaptability to changing environment. So it helps in origin of new species and evolution.

Menstrul Cycle



Phases of menstrual cycle.

1. Definiton. Menstrul cycle involves the series of cyclic changes occurring in the ovaries and female reproductive tract during the reproductive period of female.

2. Introduction. Reproductive period of female extends from puberty (i.e. 10-14 years) to

menopause (i.e. 45-55 years). During this period, everey month a menstrual cycle occurs whose peculiar feature is 'period'- the veginal bleeding (called menstruation) that lasts for about four days. Primary aim of menstrual cycle is to prepare the female for fertilization and pregnancy.

3. Period. On average, a menstrual cycle is completed in 28 days (mensem means a month) though it may vary by 1 or 2 days.

4. Phases: During the menstrual cycle. The wall of the uterus passes through several phases, Which are controlled by two hormones, oestrogen and progesterone. The first phase of the menstrual cycle usually lasts for about 4-6 days. During this period the lining of the uterus is shed, accompanied by a loss of blood. This duration of the first phase is called a woman's period. This phase is called the menstrual phase or menstruation.

Population

A population is defined as the total number of individuals of a species in a biotic community.

- The individuals of population are capable of interbreeding among themselves. Due to this mating, there is free flow of genes in a species.
- Study of human population is called as Demography.

(a) Characteristics of a population:

(i) Population density: Population density of a species is the number of individuals of a species per unit area or volume. Population density can be calculated as:

Population density = N/S

Where, N= Number of individuals in a region

S = Number of unit areas in a region

(ii) Birth rate or natality rate: The number of birth per 1000 individuals of a population per years is called as birth rate.

(iii) Death rate or mortality rate: The number of deaths per 1000 individuals of a population per year in called death rate.

(iv) Dispersal: The movement of majority of individuals from the population or into the population at one or other time during their life cycle is called as dispersal. This can be two types:

(a) Immigration: Entry of certain individuals of same species into an area from outside is called immigration.

(b) Emigration: Departure of individuals of same species from an area to outside is called emigration.

(v) Population growth: If more individuals are added in a population than lost, The population will show positive growth. But if more individuals are lost than added, then the population show negative growth. If the two rates equal then the population will be stationary and is called zero growth.

Population growth = (Birth+ Immigration) – (Deaths+ Emigration)

Overpopulation

Uncontrolled growth of population decrease the growth of any country and also causes many socioeconomic disturbances.

(a) Consequences of Overpopulation:

(i) Space shortage
(ii) Food supply shortage
(iii) Unemployment
(iv) Education shortage
(v) Pollution
(vi) Price rise
(vii) Energy crisis
(viii) Eco-degradation
(ix) Nonhygen condition

Reproductive Health

In human population size, health and prosperity are determined by the young people (i.e. between 10 to 25 years) of the population.

(a) Factors Affecting Reproductive Health:

(i) Education of young people: There is a correlation between the state of education and birth rate. Indian states with low literacy rate

- E.g. Bihar, Rajasthan etc. Have high population growth rate while literate states as kerela have low population growth rate.

(ii) Health of young people: Healthy women tend to have fewer and healthier children. Due to this national Welfare programme has shifted from reduction of infertility and growth rate to reproductive health care.

(iii) Early marriage and child bearing: Young women from 15 to 19 years face more complication of child birth and abortion which lead to their death. Their children are premature, with low birth rate, weak and anaemic.

(b) Methods to Improve the Reproductive Health of Human population:

(i) More enrolment of girls and their staying in the schools.

(ii) to avoid early marriage and child bearing tendency.

(iii) Responsible sexual behavior of the male partners towards their female partners. Boys should support their female partners in their reproductive health.

Reproductive Rights of Women

- There are many safeguards to protect the right of reproduction for women. These are as follows:
- Detection of sex of the unborn child and medical termination of female foetus is prohibited.
- According to the 1961 act of Maternity Welfare the women are provided with the special maternity leave for 42 days before and after the delivery of a child. Recently this leave has extended upto four months in total. (Indian Social System- Dr. Ram Ahuja)
- A Woman can't be deprived of the right of motherhood.

Sex Ratio

- The number of females in a population per 1000 males is called sex ratio.
  Sex ratio = Number of females/1000 males

Some Important points

- Death rate, birth rate and growth rate are called as vital rates.
- Country with negative growth is Australia.
- World population day is on 11th of July.
- Indian population is a young population.

EXERCISE

1. Voice is high pitched in
(a) Aged person (b) adult males
(c) Boys (d) females

2. Development of foetus takes place in
(a) Vagina (b) uterus
(c) Ovary (d) Oviduct

3. Vagina of the female reproductive system is
(a) Primary sex organ
(b) Accessory sex organ
(c) Secondary sex organ
(d) None of these

4. Eggs from ovary are released in
(a) Oviduct (b) Kidney
(c) Ureter (d) coelom

5. Which of the following is a bisexual organism?
(a) Earthworm (b) Pila
(c) Amoeba (d) Monkey

6. The number of chromosomes in human cell is
(a) 44 (b) 46
(c) 48 (d) 50

7. The genetic information is stored in
(a) DNA (b) RNA
(c) Ribosome (d) ER

8. 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 of the above

9. Study of trends in human population is
(a) Demography (b) Biography
(c) Calligraphy (d) Psychology

10. World population day is on
(a) 5th June (b) 11th July
(c) 4th October (d) 21st March

11. Departure of individuals of same species from an area is called as
(a) Emigration (b) immigration
(c) external immigration (d) addition

12. Total number of individuals which can interbreed is called as
(a) Species (b) phylum
(c) population (d) group

13. Menstrual cycle is controlled by
(a) Estrogen & progesterone of ovary
(b) FSH & LH of pituitary
(c) Both (A) and (B) are correct
(d) FSH of pituitary

14. Asexual reproduction by budding is common in
(a) Hydra (b) Planaria
(c) Paramoecium (d) plasmodium

15. Female sex hormone is
(a) Oestrogen (b) ADH
(c) Insulin (d) adrenaline

16. In mammals fertilization takes place in-
(a) Ovary (b) Fallopian tube
(c) Uterus (d) Vagina

17. Embryo testing is banned because it has changed-
(a) Sex ratio
(b) Population density
(c) Birth rate
(d) death rate

18. Asexual reproduction in plants is important for the following reasons.
(a) Flowers are produced.
(b) Plants can rapidly colonize new areas.
(c) Reproduction takes less energy.
(d) Self- pollination can occur.
Which one of the following alternatives is correct?
(a) A, B (b) C, D
(c) B, C (d) A, D

ANSWER - KEY

REPRODUCTION

Q.	1	2	3	4	5	6	7	8	9	10
A.	D	B	C	A	A	B	A	D	A	B
Q.	11	12	13	14	15	16	17	18		
A.	A	C	C	A	A	B	A	C		