

Solution:

There are seven horizontal rows in the modern periodic table; these rows are called periods.

Q2 Name the information source for making proteins in the cells.

Solution:

Cellular DNA is the information source for making proteins in cells.

Q3 List two measures that you would suggest for the better management of water resources.

Solution:

Two measures for the better management of water resources are:
Rainwater harvesting
Construction of dams

Q4 List four modes of asexual reproduction.

Solution:

Four modes of asexual reproduction are:

(1) Binary Fission

In binary fission, a single cell divides into two halves. Some of the organisms that divide by binary fission are bacteria and *Amoeba*.

(2) Budding

It involves the formation of a new individual from a protrusion called a bud. It is very common in plants, yeasts and lower level animals such as *Hydra*. In *Hydra*, cells divide rapidly at a specific site and develop as an outgrowth called a bud. This bud, while attached to the parent plant, develops into a small individual. When this individual becomes large enough, it detaches itself from the parent body to exist independently.

(3) Multiple Fission

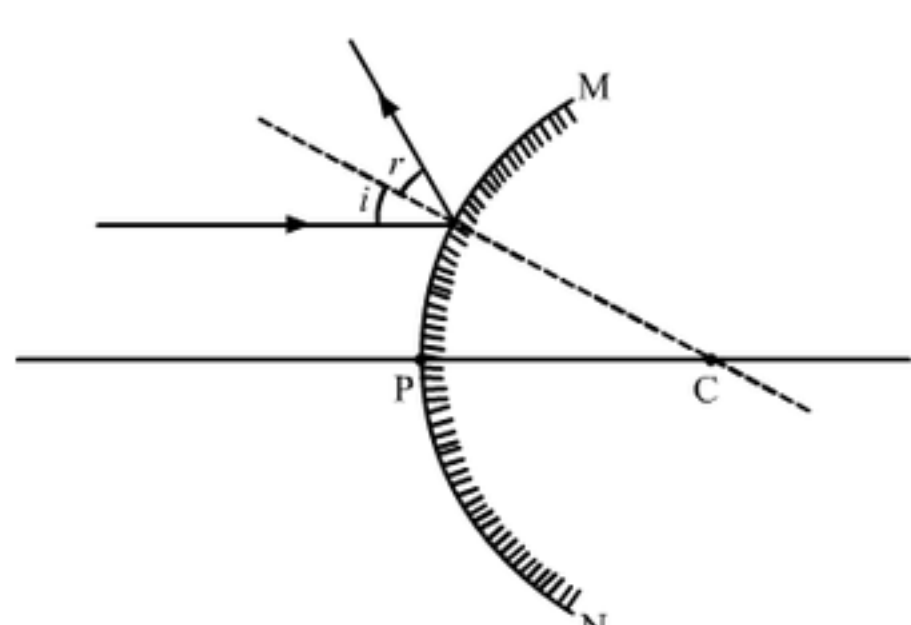
In multiple fission, a single cell divides into many daughter cells simultaneously, for example, *Plasmodium*.

(4) Fragmentation

Fragmentation is the unintentional cutting up of the body of an organism in which each part grows into a different organism. It is most commonly seen in some annelids and fungi.

Q5 Draw a ray diagram to show the path of the reflected ray corresponding to an incident ray which is directed parallel to the principal axis of a convex mirror. Mark on it the angle of incident and the angle of reflection.

Solution:



Q6 In some states of our country there is a ban on the use of polythene bags for shopping. Why? List three advantages of using jute or cloth bags over polythene bags.

Solution:

There is a ban on the use of polythene bags for shopping in some states of our country because they cannot be degraded naturally by the action of microorganisms. Because of their non-biodegradability, they stay in the soil for a long time and continue to poison it with toxic by-products that keep leaching from them. Also, they do not allow water to seep in, as they are waterproof. These polythene bags when accidentally eaten by stray animals can harm them and can even cause their death.

The three advantages of using jute or cloth bags over polythene bags are as follows:
Cloth or jute bags are environment-friendly; they are biodegradable.
They are renewable and can be easily recycled.
They have more strength than polythene bags because they are thick and can be used again and again.

Q7 List three problems which arise due to construction of big dams. Suggest a solution of these problems.

Solution:

The three types of problems that arise because of the construction of big dams are:

(i) Environmental problems: Construction of dams across rivers leads to deforestation, which results in the loss of biodiversity. This disturbs the natural ecosystem.

Solution: We should plant more and more trees.

(ii) Social problems: Construction of dams involves the building of large reservoirs. In some cases, constructing a reservoir may result in the flooding of nearby towns and villages. A large number of people get displaced as a direct consequence of the construction of reservoirs. In such cases, the government has to rehabilitate the people living in these areas, which, in itself, is a huge task.

Solution: The government should first relocate the people to a safer place where they can continue with their daily work. If, in case, the life of the people gets affected, the government should provide proper compensation to those people.

(iii) Economic problems: Construction of dams requires a huge amount of monetary investments.

Solution: Construction of dams can be profitable if they are used for the generation of electricity.

Q8 "Our food grains such as wheat and rice, the vegetables and fruits and even meat are found to contain varying amounts of pesticide residues." State the reason to explain how and why it happens?

Solution:

A large number of pesticides and chemicals are used to protect our crops from pests and diseases. Some of these chemicals are washed down into the soil, while some enter water bodies. From the soil, they are absorbed by plants along with water and minerals; and from water bodies, they are taken up by aquatic plants and animals. This is how these chemicals enter the food chain. Because these chemicals cannot decompose, they accumulate progressively at each trophic level. As the food chain proceeds, the concentration of pesticides also increases. This increase in the concentration of harmful chemicals with each step of the food chain is called biomagnification. That is why food grains, such as wheat and rice, vegetables, fruits and even meat are found to contain pesticide residue.

Q9 List any four methods of contraception used by humans. How does their use have a direct effect on the health and prosperity of a family?

Solution:

The following are the four methods of contraception used by humans:

(i) Natural method: It involves avoiding the chances of meeting of the sperm and the ovum. In this method, the sexual act is avoided from day 10th to day 17th of the menstrual cycle because during this period, ovulation is expected; therefore, the chances of fertilisation are very high.

(ii) Barrier method: In this method, fertilisation of the ovum and sperm is prevented with the help of barriers. Barriers are available for both males and females. Condoms, which are made of thin rubber, are used to cover the penis in males and the vagina in females.

(iii) Oral contraceptives: In this method, tablets or drugs are taken orally. These contain small doses of hormones that prevent the release of eggs, thus preventing fertilisation.

(iv) Implants and surgical methods: Contraceptive devices such as the loop or copper-T are placed in the uterus to prevent pregnancy. Some surgical methods can also be used to block the gamete transfer. In vasectomy, the vas deferens is blocked to prevent the transfer of sperms. Similarly, in tubectomy, the fallopian tubes of the female can be blocked so that the egg does not reach the uterus.

Effects of contraception on the health and prosperity of a family:

- (i) It helps in preventing unwanted pregnancies.
- (ii) It prevents the chances of frequent pregnancies, which otherwise affect the health of females.
- (iii) It helps in family planning by controlling the number of children in a family, thus reducing the chances of poverty.
- (iv) It also reduces the chances of transmission of sexually transmitted diseases such as AIDS.

In this way, birth control methods play an important role in the health and prosperity of a family.

Q10 (a) Write the names of those parts of a flower which serve the same function as the following do in the animals :

- (i) testis,
- (ii) sperm,
- (iii) ovary,
- (iv) egg

(b) State the function of flowers in the flowering plants.

Solution:

(a)
(i) Testis : Anther
In animals, testis is the male reproductive organ that produces sperms. Similarly, in plants, anther is the male reproductive part that produces pollen grains.

(ii) Sperm : Pollen grains
Sperm is a male gamete in animals. In plants, pollens are male gametes. The generative cell of pollen divides to produce two nuclei called male gametes.

(iii) Ovary : Ovum
In animals, ovary is the female reproductive organ that produces eggs. Similarly, in plants, ovary is the female reproductive organ that contains ovules.

(iv) Egg : Ova/Ovum
Eggs in animals are also called ova. In plants, eggs are present inside the female gametophyte, i.e., ovule.

(b) The function of flowers in flowering plants is to assist in sexual reproduction. Flower is the most important part in angiosperms because the reproductive parts are located inside it.