

# VISWASS SCHOOL & COLLEGE OF NURSING

GNM 1<sup>ST</sup> YEAR

ANATOMY AND PHYSIOLOGY

UNIT-2

INTRODUCTION TO THE DETAILED STRUCTURE OF THE BODY

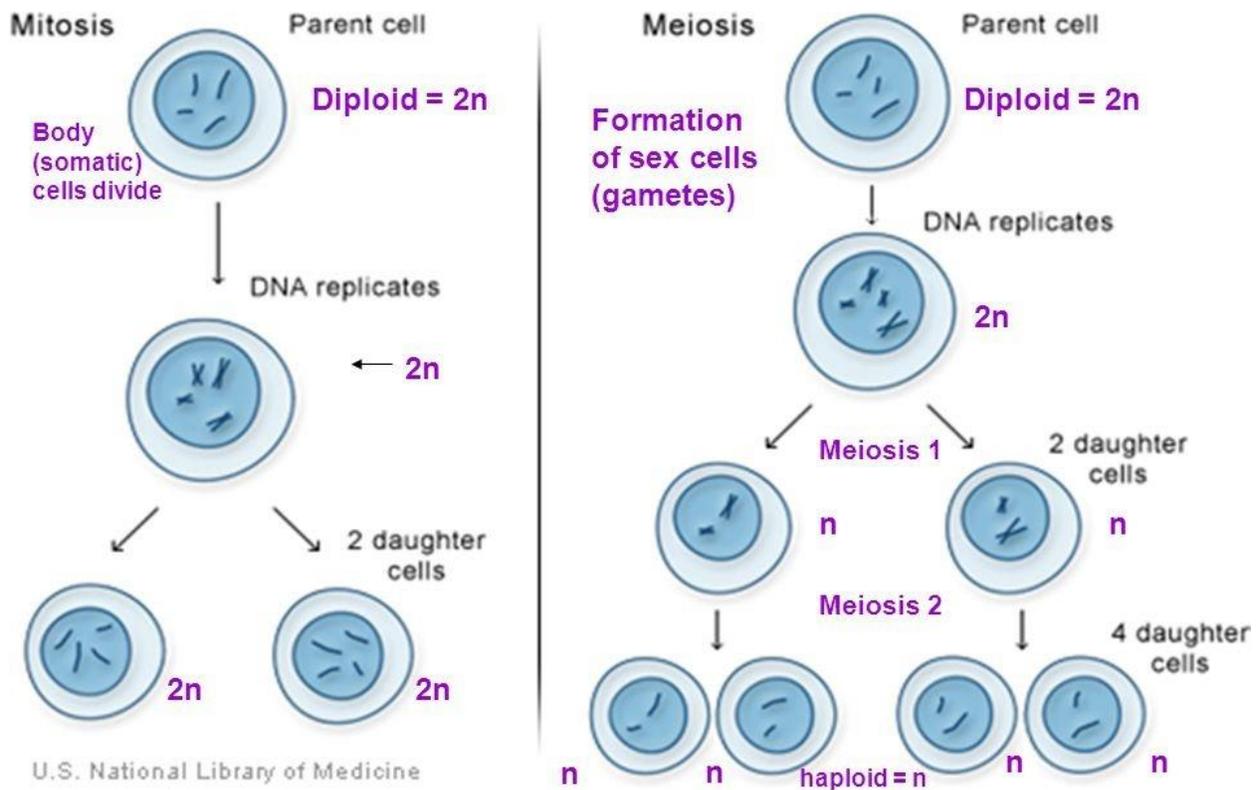
SHORT QUESTION AND ANSWER

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1. Describe about cell reproduction. (5)

Cellular reproduction:

## Cellular Reproduction: Mitosis & Meiosis



- The process by which a cell splits into two genetically identical copies is called mitosis.
- The cell must first make a second copy of all the DNA in its nucleus.
- DNA is then condensed into rod-like structures known as chromosomes. Both copies of the chromosomes stick together in the middle, which is why they look like an X under the microscope.
- Once the nuclear membrane breaks down, the chromosomes line up in a neat row at the centre of the cell.
- The chromosome pairs then split and move apart toward opposite poles of the cell before it divides into two genetically identical daughter cells.
- When sex cells, the sperm and the egg, are involved, cell division is taken to a whole other level, The process is called meiosis.
- Regular cells have 23 pairs of chromosomes (for a total of 46 chromosomes), and each pair contains one chromosome from our father and another chromosome from our mother.
- But a sex cell can only hold half of the genetic material, since it must unite with the other sex cell to produce a new individual.
- DNA in sex cells must undergo another round of division: with 23 chromosomes on one side and 23 chromosomes on the other.
- Meiosis produces four genetically different cells containing half of the genetic material.
- Meiosis is similar to mitosis, but it has an extra round of cellular division. During meiosis, the mother cell copies its DNA molecules and condenses them into rods (chromosomes).
- Both copies of the same rod are bound together at the middle to form an X. We have 23 pairs of rods, for a total of 46 chromosomes.
- The chromosomes then pair up. Once they have found their partner, they line up at the centre of the cell for the first round of division.

- The two resulting cells contain 23 chromosomes. A second division occurs. During this round, the chromosomes are divided into 23 rods in each of the 4 cells.
- During the process, chromosomes can exchange pieces of DNA. This is known as recombination.
- This shuffling of genetic material between the maternal and paternal chromosomes during meiosis leads to greater genetic diversity.