NORTH EX PUBLIC SCHOOL (Session 2020-21)

Class-VIII

Subject-science

Chapter-7 cell structure and function

Topic- nucleus

Worksheet - 6

NOTE-Before attempting the question and answers you must check the link given below which will help you understand the chapter

You can download the assignment or if you do not have the facility to get printout then you can ask you what to copy the assignment in a simple notebook and must do question and answer the notebook.

Link- https://youtu.be/btdpYooI5LI

NOTES:

Nucleus

The cell nucleus is a membrane-bound structure that contains a cell's hereditary information and controls its growth and reproduction. It is the command center of a eukaryotic cell and is usually the most notable cell organelle in both size and function.

Function

The key function of the nucleus is to control cell growth and multiplication. This involves regulating gene expression, initiating cellular reproduction, and storing genetic material necessary for all of these tasks. In order for a nucleus to carry out important reproductive roles and other cell activities, it needs proteins and ribosomes.

Protein and Ribosome Synthesis

The nucleus regulates the synthesis of proteins in the cytoplasm through the use of

messenger RNA (mRNA). Messenger RNA is a transcribed DNA segment that serves as a template for protein production. It is produced in the nucleus and travels to the cytoplasm through the nuclear pores of the nuclear envelope, which you'll read about below. Once in the cytoplasm, ribosomes and another RNA molecule called transfer RNA work together to translate mRNA in order to produce proteins.

Physical Characteristics

The shape of a nucleus varies from cell to cell but is often depicted as spherical. To understand more about the role of the nucleus, read about the structure and function of each of its parts.

Nuclear Envelope and Nuclear Pores

The cell nucleus is bound by a double membrane called the nuclear envelope . This membrane separates the contents of the nucleus from the cytoplasm , the gel-like substance containing all other organelles. The nuclear envelope consists of phospholipids that form a lipid bilayer much like that of the cell membrane. This lipid bilayer has nuclear pores that allow substances to enter and exit the nucleus, or transfer from the cytoplasm to the nucleoplasm.

The nuclear envelope helps to maintain the shape of the nucleus. It is connected to the endoplasmic reticulum (ER) in such a way that the internal chamber of the nuclear envelope is continuous with the lumen, or inside, of the ER. This also allows the transfer of materials as well.

Chromatin

The nucleus houses chromosomes containing DNA. DNA holds heredity information and instructions for cell growth, development, and reproduction. When a cell is &resting&, or not dividing, its chromosomes are organized into long entangled structures called chromatin .

Nucleoplasm

Nucleoplasm is the gelatinous substance within the nuclear envelope. Also called karyoplasm, this semi-aqueous material is similar to cytoplasm in that it is composed mainly of water with dissolved salts, enzymes, and organic molecules suspended within. The nucleolus and chromosomes are surrounded by nucleoplasm, which cushions and protects nuclear contents.

Like the nuclear envelope, the nucleoplasm supports the nucleus to hold its shape. It also provides a medium by which materials, such as enzymes and nucleotides (DNA and RNA subunits), can be transported throughout the nucleus to its various parts.

Nucleolus

Contained within the nucleus is a dense, membrane-less structure composed of RNA and proteins called the nucleolus . The nucleolus contains nucleolar organizers, the parts of chromosomes carrying the genes for ribosome synthesis. The nucleolus helps to synthesize ribosomes by transcribing and assembling ribosomal RNA subunits. These subunits join together to form ribosomes during protein synthesis.

CHROMOSOME

“A Chromosome looks like a thread and is coiled material, made of proteins. Chromosomes are present in the nucleus of all the cells and contain the basic genetic material DNA, which passes from one generation to another”.

CELL DIVISION AND GROWTH

Cell growth refers to the increase in cell size (mass accumulation) while cell division describes the division of a mother cell into two daughter cells (1->2->4->8, etc.). Cell proliferation is the process of generating an increased number of cells through cell division .

WORKSHEET-6

Q-1)What is nucleus?What are its key function?

Q- 2)Write the four different parts of nucleus?

Q-3)What is the function of nuclear pore?

Q-4)What is the function of nucleolus?

Q-5)What is the functions of chromosome?

Q-6)What are daughter cells?

ANSWERS

Answer-1)Nucleus

The cell nucleus is a membrane-bound structure that contains a cell's hereditary information

and controls its growth and reproduction. It is the command center of a eukaryotic cell and is usually the most notable cell organelle in both size and function.

Function

The key function of the nucleus is to control cell growth and multiplication. This involves regulating gene expression, initiating cellular reproduction, and storing genetic material necessary for all of these tasks. In order for a nucleus to carry out important reproductive roles and other cell activities, it needs proteins and ribosomes.

Answer-2)the four main parts of nucleus are-are-

Nuclear envelope

Nucleoplasm

Nucleolus

Chromatin threads

Answer-3)Nuclear Envelope and Nuclear Pores

The cell nucleus is bound by a double membrane called the nuclear envelope . This membrane separates the contents of the nucleus from the cytoplasm , the gel-like substance containing all other organelles. The nuclear envelope consists of phospholipids that form a lipid bilayer much like that of the cell membrane. This lipid bilayer has nuclear pores that allow substances to enter and exit the nucleus, or transfer from the cytoplasm to the nucleoplasm.

The nuclear envelope helps to maintain the shape of the nucleus. It is connected to the endoplasmic reticulum (ER) in such a way that the internal chamber of the nuclear envelope is continuous with the lumen, or inside, of the ER. This also allows the transfer of materials as well.

Answer-4). The nucleolus helps to synthesize ribosomes by transcribing and assembling ribosomal RNA subunits. These subunits join together to form ribosomes during protein synthesis.

Answer-5) CHROMOSOME

“A Chromosome looks like a thread and is coiled material, made of proteins. Chromosomes are present in the nucleus of all the cells and contain the basic genetic material DNA, which passes

from one generation to another”.

Answer-6)When a cell is formed it is a small It grows in size When it receives nutrients After reaching a certain size It divides to form two cells

The new cells formed In this manner Are called Daughter cells Which is exactly Similar to the parent cell.