Short Answer Type Questions

Q. 1. (i) What is G_1 phase in cell cycle?

(ii) How does cytokinesis differ in plant and animal cells ? [KVS 2015]

Ans. (i) G_1 phase : (a) In this phase, the cell is metabolically active and continuously grows but does not replicate its DNA.

(b) RNA and proteins are synthesized and the cell grow's in size.

S.NO.	Cytokinesis in plant cells	Cytokinesis in animal cells
(i)	In these, cell wall formation starts in the centre of the cell and grows outward to meet the existing lateral walls.	In these cells, cytoki-nesis is achieved by the appearance of a furrow in the plasma membrane.
(ii)	Formation of new cell wall begins with the formation of a precursor called cell plate.	The furrow gradually deepens and ultimately join in the cytoplasm into two.

Q. 2. What are kinetochores? What is their function?

Ans. The kinetochore is a protein structure on chromatids where the spindle fibers attach during ell division to pull sister chromatids apart. Their proteins help to hold the sister chromatids together and also play a role in chromosome editing.

Q. 3. Differentiate G_1 and G_2 phase of cell cycle ? [KVS Guwahati 2016]

Ans. Differences between G_1 and G_2 phase:

S. No.	G_1	G_2
(i)	This stage starts from the birth of the daughter cell and ends upto the time when the cell begins synthesise DNA	This stage starts from the end of S-phase upto to the beginning of M-phase.
(ii)	RNA and proteins are synthesized.	In G_2 phase, synthesis of DNA stops. Formation of RNA and protein continues.

Q. 4. What does karyokinesis mean ? What are its phases?

Ans. Karyokinesis is a series of uninterrupted changes before forming two daughter nuclei. Though karyokinesis is a continuous process, it has been divided into four phases. They are prophase, metaphase, anaphase and telophase.

Q. 5. What do you understand by interphase?

Ans. (i) Interphase is a series of changes that occur in a newly formed cell and its nucleus before it becomes capable of division again.

(ii) It is also called intermitosis. It is non-dividing state of the cell and its nucleus is called interphase nucleus.

Q. 6. Why colchicine is called as the mitotic poison?

Ans. (i) Colchicine is an alkaloid obtained from the corms of *Colchicune autumnate*. The alkaloid inhibits the formation of spindle by preventing assembly of microtubules.

(ii) The chromosomes duplicate but they remain within the same cell, increasing the number of chromosomes. As a result, the colchicine treated meristematic cells show doubling of chromosome.

Q. 7. (i) Which stage of cell division is most suitable for the study of chromosome morphology.?

(ii) Which process changes the long, fine chromatin fibres into chromosomes ?

Ans. (i) Metaphase.

(ii) Condensation.

Q. 8. Distinguish between metaphase of mitosis and metaphase I of meiosis.

Ans.

S. No.	Metaphase of mitosis	Metaphase I of meiosis
(i)	Each chromosome consists of two chromatids which are held together by centromere.	Homologous chromosomes form bivalent. Each bivalent consists of four chromatids and two centromeres.
(ii)	The chromosomes line up in one plane to make up the equatorial plate.	Bivalents become arranged in the plane of the equator forming equatorial plate.