DPP
DAILY PRACTICE PROBLEMS

Class : XIth
Date :

Solutions

Subject : BIOLOGY
DPP No. : 6

Topic :- Cell Cycle and Cell Division

1 **(b)**

Independent Assortment of Chromosomes The paternal and maternal chromosomes of each homologous pairs segregates during anaphase-I independently of the other chromosomes. Anaphase-I is the cytological event that corresponds to Mendel's law of independent assortment.

Although the paternal and maternal chromosomes of a homologous pair have the genes for the same traits, either chromosome of a pair may carry different alleles of the same genes. Therefore, independent assortment of homologous chromosomes in anaphase-I introduces genetic variability

2 **(b)**

Cytokinesis is thought to be the final part of telophase, however, it is a separate process that begins at the same time as telophase.

In telophase, new membranes forms around the daughter nuclei, when chromatids arrive at opposite poles of cell.

The chromosomes disperse and are no longer visible under the light microscope. The spindle fibres disperse and cytokinesis or the partitioning of the cell also begin during their stage

3 **(b)**

In meiosis, nucleus undergoes two divisions (first is reductional and second is equational), while chromosomes divide only once (in anaphase-II).

4 **(d)**

Amitosis is known as direct division. In this method, nuclear envelope remains intact. *The steps involved in amitosis are as follows*

(i) The nucleus of the cell elongates and develops a constriction round its middle

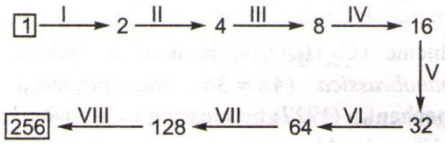
(ii) The constriction in nucleus gradually deepens and finally cuts the nucleus into two daughter nuclei

(iii) The constriction appears in the cytoplasm

(iv) The cytoplasmic constriction divides the parent cell into two daughter cells, each with a nucleus

5 **(d)**

As a result of mitotic division, the number of daughter cells becomes double. Thus, 8 mitotic divisions are required to produce 256 daughter cells from a single cell.



6 **(d)**

The second check point called mitotic cyclin lies between G_2 and M-phase and causes transition from G_2 to M-phase

7 **(b)**

A-Nuclear division; B-Karyokinesis; C-Cytokinesis

8 **(b)**

In the G_1-phase of interphase, the cell is metabolically active and continuously grows but do not replicate its DNA S or synthesis phase marks the period during which DNA synthesis or replication takes place. During this time, the amount of DNA per cell gets double

9 **(b)**

Replication of DNA takes place during S-phase of cell cycle. The number of chromosomes reduced only in meiosis. So, the number remains 14 in G_1-phase

10 **(a)**

Chromosomal crossing over is the exchange of genetic material between homologous chromosomes that results in the recombinant chromosomes. It occurs during prophase-I of meiosis

11 **(a)**

Lampbrush chromosomes are present in growing oocytes, during the diplotene stage of meiotic prophase-I. Chromosomes transform into the Lampbrush form due to an active transcription of many genes

12 **(a)**

Prophase-I is the longest stage in the first division of meiosis and is divided into a number of substages. The chronological sequence is leptotene, zygotene, pachytene, diplotene and diakinesis.

The characteristic phenomenon during pachytene is the exchange of chromosomal segments, *i.e.,* the recombination of gene or crossing over

13 **(b)**

Chiasmata formation is the consequence of crossing over. Each chiasma possesses the site of exchange of material between non-sister chromatids. It is produced by breakage and reunion between any two of the four strands present at each site. Chiasmata are most appropriately observed during **diplotene sub-stage** of **meiosis-I**.

14 **(a)**

Long thin thread-like chromosome lie in unpaired condition in **leptotene** of prophase-I.

15 **(d)**

During meiosis, beads like structures are absent on chromosomes and separation of two basic sets of chromosome occurs

16 **(c)**

Some cells that do not divide further, exit G_1-phase and enter an inactive stage called quiescent stage (G_0) of the cell cycle. Cells in this stage remains metabolically active but no longer proliferate unless called on to do so depending on the requirement of the organism

17 **(c)**

During **anaphase** stage of mitosis, centromere of the chromosome divides and the two chromatids start repelling each other, separate completely to become daughter chromosome and move towards the opposite poles.

18 **(c)**

The S and G_2-phases of interphase are followed by prophase. Prophase is marked by the initiation of condensation of chromosomal material. The chromosomal material become untangled during the process of chromatin condensation. Centriole, now begins to move towards opposite poles of the cell.

Therefore, when dividing cells are examined under a light microscope, in prophase only the chromosomes become visible

19 **(b)**

Recombination of **genes on** the same chromosome is accomplished by crossing over, a process by which parts of homologous chromosomes are interchanged. Crossing over takes place between non-sister chromatids of homologous chromosomes in pachytene stage of meiosis-I.

20 **(d)**

G_1-phase corresponds to the interval between mitosis and initiation of DNA replication. During G_1-phase, the cell is metabolically active and continuously grows but do not replicate its DNA

ANSWER-KEY										
Q.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
A.	**b**	**b**	**b**	**d**	**d**	**d**	**b**	**b**	**b**	**a**
Q.	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
A.	**a**	**a**	**b**	**a**	**d**	**c**	**c**	**c**	**b**	**d**