DPP
DAILY PRACTICE PROBLEMS

Class : XIth
Date :

Solutions

Subject : BIOLOGY
DPP No. : 3

Topic :- Cell Cycle and Cell Division

1 **(a)**
Homologous chromosomes segregate when a cell undergoes meiosis.

2 **(a)**
Meiosis is a reductional division, in which the chromosome number is reduced to half. It was proposed by **Farmer** and **Moore**. It is found only in diploid germ cells and is main cause of variations. During meiosis, four daughter cells are formed from one cell.

3 **(d)**
Meiosis is a reductional division, in which chromosome number is reduced to half, *i. e*, haploid. It is generally observed in sex cells, *i. e*., male and female gametes. In bryophyte or pteridophyte, meiosis occurs in generative cells like **spore mother cells**.

4 **(b)**
The process of crossing over takes place in pachytene stage of prophase-I of meiosis-I. In this process, some genes of two non-sister chromatids of a bivalent are exchanged.

5 **(b)**
Metaphase plate is the plane of alignment of the chromosomes at metaphase.
During metaphase, spindle fibres attach to kinetochores of chromosomes.
Chromosome are moved to spindle equator and get aligned along metaphase plate through spindle fibres to both poles

6 **(b)**
Cell cycle was described by **Howard** and **Pelc** in 1953. The sequence of events by which a cell duplicates its genome, synthesizes the other constituents of the cell and eventually divides into two daughter cells is termed as **cell cycle**

7 **(b)**
In animal cells, cytokinesis involves the contraction of the contractile ring of microfilaments.

8 **(a)**
In meiotic division metaphase-I spindle apparatus starts appearing and bivalents become attached to spindle through centromeres. Bivalents then appear in the form of an equatorial plate due to the movement known as 'congression'.

9 **(a)**
Crossing over is a process that produces new combination of genes by interchanging of segments between nonl-sister chromatids of homologous chromosomes. It occur between homologous chromosomes at four stranded stage during pachytene of prophase-I of meiosis-I.

10 **(b)**

The cell cycle is divided into two basic phases
Interphase and M-phase (mitotic phase). *Interphase further divides into three phases:* G_1-phase, S-phase and G_2-phase

11 **(d)**
Colchicine prevents spindle formation, which occurs during **metaphase** stage of cell division.

13 **(a)**
Kinetochores serve as the sites of attachment of spindle fibres to the chromosomes that are moved into position at the centre of the cell.

14 **(c)**
Cell division cannot be stopped in S-phase. The S-phase is the synthesis phase, in which the cell synthesises a replica of its genome, *i*. *e*., DNA replication occurs which ultimately result in the duplication of chromosomal material.

15 **(a)**
As a result of meiosis, the gamete of AaBb will be AB, aB, Ab, ab.

16 **(c)**
The stage between two meiotic divisions is called **interkinesis**. It is generally short lived and is followed by prophase-II, a much simpler prophase than prophase-I of meiosis-I.

17 **(d)**
The number of different haploid cells arise by meiosis can be calculated by 2^n where, n=number of haploid chromosomes.

18 **(c)**
The cell cycle is controlled by enzymes like cyclin dependent kinases (CdKs). CdKs phosphorylate amino acids like serine and threonine which initiates or blocks the activities related to cell cycle.
The other check points involved in cell cycle are
1. G_1check point (Enter S or synthesis) is controlled by CdK_4/Cyclin D, CdK_6/Cyclin D
2. G_2 check point (Enter M or maturation promoting factor) by is controlled CdK_2/cyclin B
3. Metaphase check point is controlled by cyclin B degradation

19 **(c)**
During pachytene substage of prophase-I of meiosis, the chromosomes are tetravalent *i*. *e*., contain two chromatids with each chromosome arms. Crossing over during this substage, which involves the exchange of segments between the non-sister chromatid of homologues.

20 **(d)**
Colchicine treatment doubles the chromosome number.

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