

1. The sequence of events by which a cell duplicates its genome, synthesises the other constituents of the cell and eventually divides into two daughter cells is termed as
(a) cell division (b) cell cycle
(c) cell growth (d) cell duplication
2. Cell growth is a continuous process in terms of
(a) cytoplasmic increase
(b) increase in DNA content
(c) increase in protein content
(d) increase in total cellular contents
3. The phase between two successive M-phase is called
(a) S-phase (b) G₁-phase
(c) G₂-phase (d) Interphase
4. In M-phase, the division of cytoplasm is
(a) cytokinesis (b) cytodivision
(c) diakinesis (d) None of these
5. The correct sequence of phases of cell cycle is **NEET 2019**
(a) G G S M 1 2 → → → (b) S G G M 1 2 → → →
(c) G S G M 1 2 → → → (d) M G G S 1 2 → → →
6. During the G₁-phase of cell division
(a) RNA and proteins are synthesised for cell growth and subsequent DNA replication
(b) DNA and proteins are synthesised
(c) centriole duplicates in the cytoplasm
(d) cell undergoes duplication
7. During cell growth, DNA synthesis takes place in **NEET 2016**
(a) S-phase (b) G₁-phase
(c) G₂-phase (d) M-phase
8. The phase of cell cycle in which the centriole duplicates in the cytoplasm?
(a) S- phase (b) G₁- phase
(c) G₂- phase (d) G₀- phase
9. The plant cells can show mitotic division in
(a) diploid cells (b) haploid cells
(c) polyploid cells (d) Both (a) and (b)
10. The centriole moves to opposite poles of the cell in which stage?
(a) Prophase (b) Metaphase
(c) Anaphase (d) Telophase
11. Spindle fibres attach on to **NEET 2016**
(a) kinetochore of the chromosome
(b) centromere of the chromosome
(c) kinetosome of the chromosome
(d) telomere of the chromosome
12. Given diagram indicates which of the following phase of mitosis? Choose the correct option.
(a) Interphase (b) Prophase
(c) Metaphase (d) Anaphase
13. During which phase of mitosis the chromosomes may appear in the V, L, J, or I-shaped structures?
(a) Prophase (b) Metaphase
(c) Anaphase (d) Telophase
14. Mitotic poisons are chemicals or substances that interfere with normal mitotic division. One such chemical is, which interferes with formation during of mitosis cell division. The blanks are correctly filled by which of the following options?
(a) colchicine, spindle, prophase
(b) colchicine, centromere, anaphase
(c) colchicine, spindle, metaphase
(d) colchicine, centromere, telophase
15. When karyokinesis is not followed by cytokinesis, it results in the formation of
(a) uninucleate cells (b) multinucleate cells
(c) undifferentiated cells (d) diploid cells
16. The type of division that ensures the production of haploid phase in the life cycle of sexually reproducing organisms is
(a) mitosis (b) meiosis
(c) cytokinesis (d) interphase
17. Meiosis involves two cycles of

- (a) Cell division (b) Nuclear divisions
(c) DNA replication (d) Both (a) and (b)

18. Longest phase of meiosis is

- (a) prophase-I (b) prophase-II
(c) anaphase-I (d) metaphase-II

19. During meiosis, the homologous chromosomes

- (a) pair up during pachytene
(b) are prepared for separation
(c) contain identical genetic information
(d) None of the above

20. When paternal and maternal chromosomes exchange their genetic material with each other in cell division, this event is called

- (a) bivalent forming
(b) crossing over
(c) synapsis
(d) dyad forming

21. The X-shaped structures observed during diplotene are

- (a) chiasmata (b) synaptonemal complex
(c) bivalent complex (d) None of these

22. Splitting of centromere and hence separation of chromatids occurs during

- (a) prophase-II (b) anaphase-I
(c) anaphase-II (d) metaphase-II

23. After meiosis-I, the resultant daughter cells have **NEET (Odisha) 2019**

- (a) same amount of DNA as in the parent cell in S-phase
(b) twice the amount of DNA in comparison to haploid gamete
(c) same amount of DNA in comparison to haploid gamete
(d) four times the amount of DNA in comparison to haploid gamete

24. Why is mitosis called equational division?

- (a) Because some equational method is used for dividing the cells
(b) Because chromosome number of daughter cells remains equal to parent cell
(c) Both (a) and (b)
(d) None of the above

25. Find examples where the four daughter cells from meiosis are equal in size (I) and where they are found unequal in size (II).

- (a) I. Microsporogenesis II. Megasporogenesis
(b) I. Spermatogenesis II. Oogenesis
(c) Both (a) and (b)
(d) None of the above

26. Mitosis is characterised by

- (a) reduction division
(b) equal division
(c) Both (a) and (b)
(d) pairing of homologous chromosomes

27. Which of the events listed below is not observed during mitosis?

- (a) Chromatin condensation
(b) Movement of centrioles to opposite poles
(c) Appearance of chromosomes with two chromosomes joined together at the centromere
(d) Crossing over

28. Meiosis occurs in organisms during

- (a) sexual reproduction
(b) vegetative reproduction
(c) asexual reproduction
(d) Both (a) and (b)

29. At which stage of meiosis is the genetic constitution of gametes is finally decided?

- (a) Metaphase-I (b) Anaphase-II
(c) Metaphase-II (d) Anaphase-I

30. A bivalent in meiosis-I consists of

- (a) two chromatids and one centromere
(b) two chromatids and two centromeres
(c) four chromatids and two centromeres
(d) four chromatids and four centromeres

1. (b)
2. (a)
3. (d)
4. (a)
5. (c)
6. (a) During the G₁-phase of cell cycle (the longest phase of cell cycle), cell synthesises RNAs, proteins and other biochemicals for cell growth and subsequent replication of DNA.
7. (a)
8. (a)
9. (d)
10. (a)
11. (a) Spindle fibres attach to the kinetochores present on the surface of the chromosome.

It is a disc-shaped structure made up of proteinaceous microtubules.

12. (d)
13. (c) During the anaphase stage of mitosis, the chromosomes may assume V, L, J or I-shaped structures. During the migration of chromosomes, the centromeres lead the path toward the poles, while the arms trail behind which results in different shapes of these chromosomes.
14. (c) Option (c) is the series of that correctly fills the given blanks. Colchicine is an alkaloid in a mitotic division which interferes with the spindle formation by preventing assembly of microtubules during the metaphase of mitosis cell division.
15. (b) In some organisms, when karyokinesis is not followed by cytokinesis, it results multinucleate condition which leads to the formation of syncytium.
16. (b)
17. (d) Meiosis involves two sequential cycles of nuclear and cell division called meiosis-I and meiosis-II, but only a single cycle of DNA replication (during S-phase of interphase).
18. (a) Longest phase of meiosis is prophase-I because it involves major events like synapsis and crossing over of chromosomes. These events occur in five substages namely leptotene, zygotene, pachytene, diplotene and diakinesis. Prophase-I is more complex than mitotic prophase stage.
19. (b)
20. (b) The figure given shows the zygotene substage of prophase-I of meiosis-I. During this stage, chromosomes start pairing together by the process called synapsis. In case of other options, (a) shows leptotene, (c) is anaphase-I and (d) is telophase-I.
21. (a)
22. (c) During anaphase-II, the centromere splits and the sister chromatids of homologous chromosomes separate. This event is similar to the anaphase stage of mitosis. But during anaphase-I, the homologous chromosomes separate without the splitting of centromere.
23. (b) After meiosis-I, the resultant daughter cells contain twice the amount of DNA in comparison to haploid gametes. Meiosis-I causes segregation of homologous pairs of chromosomes. However, each chromosome is double-stranded, having two sister chromatids due to DNA replication before the beginning of meiosis.
24. (b) Mitosis is called as an equational division, since, the chromosome number of daughter cells remains equal to that of parent cells.

25. (c) Option (c) is correct. During microsporogenesis (plants) and spermatogenesis (human), four daughter cells are formed from meiosis and they are equal in size. While in megasporogenesis (plants) and oogenesis (human), four daughter cells formed are of unequal size.
26. (b) Mitosis is characterised by equal division because the chromosome numbers in the daughter cells remains the same as that of parent cell. While reduction division is the characteristic of meiosis in which chromosomes gets reduced to half in daughter cells.
27. (d) Crossing over is not observed during mitosis. It is the phenomenon of genetic exchange between homologous pair of chromosomes and it is a characteristic feature of meiotic cell division. Rest of the options represent stages in mitosis.
28. (a) Meiosis occurs in sexually reproducing organisms to reduce the chromosome number to half before their gametes unite, so as to maintain the constant chromosome number ($2n$) in the progeny, i.e. zygote.
29. (d) The genetics of gametes is decided at the anaphase-I after which each cell receives half the initial chromosome number.
30. (c) The complex formed by a pair of synapsed homologous chromosome is called a bivalent or a tetrad. A bivalent chromosome in meiosis-I consists of two centromeres and four chromatids.